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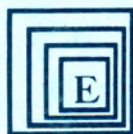
TRAINED AGRICULTURAL MANPOWER NEEDS IN TROPICAL AMERICA



Prepared for:

ESCUELA AGRICOLA PANAMERICANA

Tegucigalpa, Honduras



EXPERIENCE[®], INCORPORATED
MINNEAPOLIS, MINNESOTA 55402

December, 1985



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Contract #1684

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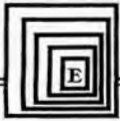
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207034

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P R E F A C E

Experience, Incorporated wishes to acknowledge contributions to this study from a very cooperative EAP Board of Directors who provided guidance and direction for the study. Also contributing significantly were EAP Director Simon E. Malo, Dean Jorge Roman, and members of the faculty and staff who provided assistance in contacting graduates, assisting in selection of interviewers, and conducting the evaluation of curriculum.

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I. PRINCIPAL FINDINGS

A. Summary and Conclusions

This section summarizes the principal findings and results of the manpower study and presents conclusions on major dimensions of the market, programs of study, and selected issues. This summary identifies useful suggestions for change and their foundation. It also documents the respected job of training accomplished by EAP. Part B of this section proceeds from the summary to identify alternative new strategies, their consequences, and recommendations.

1. Employment Profile

- o Most EAP graduates surveyed find employment in agricultural production and government, few in marketing or processing.
- o The graduates are rather stable in the workforce, with most movement occurring in the same industry.
- o Administration, management, and upper level technical jobs are the most common job class of the graduates.

2. Graduate Assessment of the School

- o Both early and recent graduates cite benefits of practical education at EAP.
- o Recent graduates state "lack of title" upon graduation as a deficiency.
- o Training in mechanics and marketing is frequently identified as "lacking depth" by recent graduates.

- o Early graduates cite their training as deficient in agricultural business, economics, and basic science.
- o Both early and recent graduates identify benefits of EAP discipline and training in work habits and benefit of close personal association.
- o Early graduates cite few deficiencies in the areas of student life.

3. Programs of Study

a. Communications and Human Relations

- o This area of study is widely used on both the first and current job as reported by graduates.
- o Employers also recorded this area as the most widely used by graduates.
- o Communications competencies ranked higher than technical agriculture as employers' reasons for hiring, retaining, and promoting an employee.
- o In the competency assessment, this area was rated low in performance in comparison to employer expectations.
- o Responses indicating inadequate training in this area were repeated in the open-ended section of the graduate survey.

Conclusion

Provisions need to be made for the inclusion of courses or activities that aid in the development of writing and speaking skills as evidenced by the results of this evaluation.

b. Agricultural Crop Production

- o Graduates indicated a high degree of satisfaction with this area of the program of study, indicating the mix between theory and practice was very good for both the first and current jobs.
- o Competencies from this area are used widely in both the first and current jobs.
- o A balanced instructional approach is utilized for the field experience modules in this area.
- o Competencies for this area were among the most used as reported by employers.
- o There was a great deal of agreement between faculty and employers in assessing the level of performance for competencies in this area.

Conclusion

General satisfaction among employers, faculty, and students with this component results in little need for change in this area of the curriculum.

c. Soils

- o Graduates indicated that they were highly satisfied with this area of study for both their first and current jobs.
- o Although soils is taught as a part of the Agronomy program, there were more graduates who indicated that additional emphasis should be placed on the practical aspects of this subject area.
- o Employers expect over 40 percent of the graduates to be competent in conservation and utilization of soil resources.
- o Faculty assessments and employer judgments were about equal for the level of performance for the competencies in this area.
- o Future employees will be expected to have higher performance levels for this instructional area than are now required of EAP graduates.

Conclusion

Additional practical experience is needed for this component, especially when future employees will be expected to have greater competence in conservation and utilization of soil.

d. Animal Science/Livestock

- o Graduates expressed a high degree of satisfaction with the animal science training, and faculty judged them to perform well in most competencies.

- o Graduates' comments relating to the mix between theory and practice reveal that there exists about the right proportion of each in the instructional program.
- o Employers preferred and expect graduates in the future to have a higher level of competence than exhibited at present.
- o Fifty percent of the graduates were judged to be non-performers in the competency related to an understanding of policies that have an impact on the livestock market.

Conclusion

Technical skills are generally adequately developed for production; however, greater emphasis should be placed on training to provide market-oriented competencies.

e. Agricultural Business

- o Early graduates cited their training as deficient in business and economics.
- o Too much theory and too little practice occur in this area of instruction according to graduates.
- o Faculty were conservative in their appraisal of graduates' performance in this area, rating the competency level well below that reported by employers for both actual and preferred.
- o Employers preferred that graduates possess higher levels of competence for this area than when initially employed.

- o Graduates ranked this area among the lowest in satisfaction with the academic program.

Conclusion

This curriculum area requires close scrutiny in planning for changes at EAP. The whole area of agribusiness requires greater emphasis in both academic and practical instruction to develop these skills for a changing workplace.

f. Agricultural Mechanization

- o Training in this area was frequently described as deficient by recent graduates.
- o The competencies in agricultural mechanics were used by less than one-third of the graduates.
- o Over two-thirds of the employers required the use and maintenance of major tools, yet indicated that graduates could not perform this competency.
- o Graduates were dissatisfied with the instructional program in this area.
- o The open-ended narrative included comments about the deficiencies in agricultural mechanics.
- o Graduates indicated that too much theory and too little practice are characteristic of this instructional area.

Conclusion

The agricultural mechanics program was characterized as the most deficient area by both the graduates and the curriculum evaluation segment of the study; yet, employers require less than one-third of their employees to possess these competencies. This would suggest that careful consideration be given to this component before major changes are considered. With little emphasis in mechanics instruction at Latin American institutions, EAP may want to consider an optional program in this area.

g. Economic Management and Marketing

- o This area was characterized by graduates as being too theoretical and in need of more practical experience.
- o Employers judged graduate performance to be acceptable in this area and above faculty expectations.
- o About two-thirds of the graduates are not expected to use the competencies cited.
- o Faculty assessments of this area were realistic when compared with employer judgments, indicating that the faculty is aware that deficiencies exist and were consequently conservative in their evaluation.
- o The open-ended responses also included comments about the deficiencies which exist in this area.

Conclusion

Increasing demand for these skills requires a practical training that will meet future agribusiness needs.

h. Horticulture

- o These competencies are the least used of any program area of study for both the first and current jobs.
- o Employers judged graduates to be able to perform these competencies better than was expected by faculty.
- o Graduates were highly satisfied with the mix of theory and practical training in this area.
- o Only 9 percent of the graduates were expected to use competencies in the forestry component, perhaps indicating the low concern previously given by employers for forestation and reforestation in many Latin American countries.
- o The field experience modules are very labor intensive as compared to the development of human relations and management competencies.

Conclusion

Except for competencies in forestry training, this area of the curriculum appears good. However, the school should evaluate the time and resources devoted to this area of instruction considering its limited use by the majority of graduates. A specialization option in this field may be a good choice.

4. Program Specialization

The issue of program specialization is addressed by graduates in their assessment of the program at EAP. The following information indicated the importance of this issue for the various groups concerned with the study.

- o Within the crop production area, a great deal of time and resources are being expended in the integrated pest management (IPM) program during the three years.
- o Table V-29 shows that over one-fourth of the respondents in the second choice category selected the scenario which would encourage students to specialize in an area, and others believed specialization should be included in a fourth year.
- o In the open-ended segment of the survey, about 20 persons indicated a lack of opportunity to specialize in an area, and another 31 commented on the lack of opportunity for in-depth study (Tables V-20-21).
- o One program director indicated that less, not more, specialization is needed and that agriculture "generalists" will be in demand.
- o Nearly two-thirds of the respondents were involved in post-graduate training, workshops, and seminars.
- o Many jobs make use of in-depth knowledge in specific fields, suggesting that an opportunity for specialization, while somewhat reducing the size of the uniform curriculum, might be considered.

5. Degree Program

a. Current Advanced Education of Graduates

- o One-third of EAP graduates continue education for a B.S. degree, most of whom obtain the degree in United States institutions. It should be recognized, however, that the percentage who pursue the B.S. degree was higher for early graduates compared to graduates of the past eight years. Length of time for study was most frequently two years, from one to four years of study. Most of the post-EAP study is in agriculture.
- o In addition to those with an objective of a degree, a large percentage of the graduates participate in professional improvement workshops and seminars.

b. Graduate Preferences

- o Of 359 responses from EAP graduates, over three-quarters would prefer to obtain a degree at EAP, if available.
- o Two-thirds of the EAP graduates, considering options for change, preferred continuing a three-year program at EAP with current enrollment and to add more courses and time leading to a degree. A majority of the graduates hold the opinion that a degree program would contribute to their employability, ability to receive promotions, and ability to pursue higher education, and also contribute to the employment needs of Latin America. They do not believe that a program change would alter the ability of EAP to maintain strong discipline, good work habits, and other values deemed as desirable attributes in their training.

- o Many graduates cited the lack of a title as a limitation to their professional advancement.

c. Market Requirements

- o The supply of B.S. degree equivalent personnel in agriculture is considered adequate to surplus. Yet, a significant number of new jobs are projected for this level of training.
- o The quality of the EAP training is identified by both employers and graduates as highly desirable in the marketplace. Of 186 responses from employers of EAP graduates, 55 percent rated Zamoranos above average in nine personal attributes thought to be important by employers, while only 3 percent rated them below average. High levels of technical training and practical experience are frequently cited by employers of EAP graduates.
- o In the future, employers generally expect to hire persons with a higher level of skill than presently possessed by EAP graduates. Additionally, performance levels of some skills in agriculture business, economic management and marketing, and communications fall short of employers' preferences and future expectations. It is doubtful that EAP can meet these needs while maintaining the integrity of the current program without extending the program.
- o Most significant is the realization that the school in its present form now serves the needs of students, employers, and the Latin American community very well. It is an institution that receives high marks from students, employers, and educators. It

would be an error to destroy what is working and what is accepted. It may, however, be altered to provide a B.S. equivalent degree and curriculum changes that are identified by this study. Graduates with a degree from a high quality program will be absorbed in the marketplace from a school that continues to demonstrate the superior quality of the product.

6. Character of the School

The educational program at EAP is characterized by a sound philosophy and approach. A general impression that is evident from reviewing the results of the study is that the school has done and continues to do a very good job of preparing manpower for the Latin American marketplace.

Moreover, the evaluation of the curriculum, graduates, and employment opportunities gives cause for optimism where Zamorano is concerned. Therefore, the basic result of this study is to provide information that will assist the administration and board of directors in fine tuning and improving an existing quality institution.

B. Alternatives and Recommendations

The purpose of this section is to define more clearly a number of alternatives for the organization of the program of study at EAP. Because EAP is already highly rated by its faculty, its graduates, and those who employ EAP graduates, the alternatives are not intended to signal specific weaknesses in the EAP program. Rather, they provide a range of options for modifying the program of study to improve upon the ability of the school to meet the demands of the marketplace and provide service to students.

The alternatives are divided into two categories: modification that can take place within the present mission statement of EAP, and modifications that could occur only if the mission of EAP were expanded or changed in focus. A number of alternatives are presented for consideration. The evidence produced in this study may suggest that one alternative is superior or more desirable than another, yet all of the alternatives merit consideration.

Changing the character of the school through modification or changes in mission is a policy decision best deliberated by the board of directors, administration, and student body. The consequences of a major change must be carefully studied and related to the values and beliefs upon which they would impinge. Likewise, not to alter the character of the school also has consequences which must be given the same careful consideration.

To aid the board of directors in deliberating on the future direction of EAP, a number of alternatives, each thought to be viable, are presented. Each alternative is described, evidence is presented as to its viability, modifications necessary to implement the alternative are suggested, and some of the major consequences of the alternative are outlined. It should be understood that all alternatives would be accompanied by needed modifications in curriculum and activities, even if they are not specifically mentioned.

1. Present Mission Related Alternatives

There are two alternatives that could be considered within the current mission statement of EAP that would leave the character of the school basically unaltered.

- o Retain EAP as it now exists with adjustments in curriculum content to better meet the needs of the marketplace.

- o Retain the basic character of EAP as it now exists, but allow some opportunity for students to specialize in one of the technical areas.

a. Alternative One: Leave EAP as it now exists with curriculum modification. This alternative needs little description since the changes suggested relate to internal curriculum modifications only, rather than an adjustment in organization and/or management.

The evidence:

- o Graduates are generally very satisfied with the overall program of EAP.
- o Employers express a high level of satisfaction with EAP graduates.
- o The future demand for existing (agronomo level) graduates is expected to remain fairly high.
- o Almost all EAP graduates were employed in jobs or positions that utilized skills learned at EAP.
- o The practical experience character of the educational program was thought to be very important by a larger number of graduates.
- o The mismatch between employer expectations for future employees and their assessment of the skill levels of EAP graduates suggests some areas where curriculum modification is warranted.

Modifications Necessary:

The only modifications necessary are adjustments in the curriculum. A careful study by the faculty and department chairpersons in each discipline area of the competency information gathered in this study would provide clues for curriculum modification. A periodic follow-up of a sample of graduates and employers would determine if the modifications were meeting the needs of the marketplace and resulting in student satisfaction with the program.

Consequences:

- o Graduates of EAP may become less competitive in the marketplace in the future as employers place increasing value on the B.S. level degree.
- o Graduates will continue to fill the same general niche in the employment market as past history would indicate, at a lower starting salary than enjoyed by those with degree credentials.
- o No major modifications would need to be made in the staff or facilities at EAP, and costs could be more easily projected in planning.
- o Potential students who have specialized interests or seek a B.S. degree (or equivalent) would not be attracted to EAP.

b. Alternative Two: Leave the basic program at EAP in place with some opportunity for specialization. The basic two-year program of study would be the same for all students, with specialization allowed in the third year of the program. Specializations would be limited to three or four areas the school was best equipped to provide, such as animal science, crops and

soils, horticulture, or agriculture business, management, and marketing. A general curriculum would also be allowed for those who chose not to specialize.

The evidence:

- o While employers are generally satisfied with graduate performance, the level of performance desired in the future is higher than is now produced.
- o Many of the competency areas are not used by graduates in their employment.
- o Graduates looked favorably on the opportunity to specialize or study in depth.
- o Graduates are not highly mobile among the various segments of the agricultural sector, suggesting that specialized study would not further reduce mobility.
- o Some degree of specialization may ease the transition into specialized degree study programs where most study a specific agricultural discipline.

Modifications necessary:

- o Restructuring curriculum so that most of the basic courses expected to be part of every graduate's program of study are offered in the first two years.
- o Development of a series of advanced courses in each specialization area.

- o Development of a system of student counseling and advising for the selection of a specialization with current data available on the demand for graduates in each specialization area.
- o Restructuring the procedure for accomplishing the work required for the operation of the school farm production and processing enterprises to compensate for the uneven distribution of students among the various specialties.
- o Improved placement procedures for graduates so specialized students find employment in industries for which they are trained.
- o Persistent monitoring of the skills demanded by employers so that the level of satisfaction with graduates can be maintained and improved.

Consequences:

- o Employers would have graduates more highly skilled in their specialty and able to perform at the high levels of performance expected by employers.
- o Without careful placement in the industry for which the student is trained, employer satisfaction could decline.
- o Graduates may lose some job mobility to industries for which their specialization does not apply.
- o Some increase in faculty may be required to handle the increased number of courses.

- o Class size would be smaller in the advanced specialization courses, resulting in less efficient operation of the school.
- o Student satisfaction with the EAP program may increase if students specialize in an area of high interest.
- o Time required to administer the program of study would increase.
- o More attention would be necessary for scheduling student practical experiences with stand-by employees needed in areas where student labor was not adequate for school farm needs.
- o The graduates' desire for specialization and in-depth study would be met.
- o The basic character of EAP with a strong emphasis on hands-on experience would not be altered.
- o Graduates of EAP may become less competitive in the marketplace in the future as employers place increasing value on the B.S. equivalent degree.
- o Graduates will continue to fill the same general niche in the employment market as past history would indicate, at a lower starting salary than enjoyed by those with degree credentials.

2. Alternatives Requiring Modification in Mission

Two alternatives requiring a modification of the mission of EAP appear to be viable. Both would require an expansion of the

curriculum of EAP to prepare part or all of the graduates at the B.S. degree level.

- o Retain the agronomo level for the majority of students, but provide additional instruction requiring another year leading to the B.S. degree equivalent for students of high ability and high performance.
- o Expand the curriculum for all students so the terminal degree was the B.S. degree equivalent.

a. Alternative One: Retain agronomo level instruction with B.S. equivalent education for selected students. The basic program of EAP would remain intact for the majority of students. Specialization as previously described would be implemented for those seeking the agronomo as the terminal degree. A portion of the students (30-50 percent), on the basis of their ability and performance, would be given the option to enroll for a fourth year to complete the additional requirements for a B.S. equivalent degree. Such opportunity may or may not be tied to the use of these students as field instructors in the experience modules.

The evidence:

- o The most frequently expressed complaint of graduates was the lack of title.
- o A significant number of EAP graduates continue their education after leaving EAP. Most would prefer to train for a degree at Zamorano.
- o A significant number of graduates perceived that the lack of a B.S. equivalent degree hampered their job advancement in the work force and restricted their ability to capitalize on their EAP training.

- o Retaining the agronomo level is in keeping with the projected demand for technically trained personnel.
- o The level of training of EAP faculty is consistent with other colleges offering the B.S. equivalent degree.
- o Employers project that future employees will need to be more highly skilled and specialized.
- o EAP has been highly successful in producing quality graduates with the current diploma level training, a track record that should not be ignored.

Modificātions necessary:

- o Expansion of the curriculum in the basic sciences, mathematics, communications, business, economics, and liberal arts.
- o Expansion of faculty and support staff.
- o Development of a limited number of specialization areas with advanced courses.
- o An expanded student services unit to provide counseling, guidance, programming, and advising for students selected for B.S. equivalent degree study.
- o An expansion in the library and learning resources center to accompany advanced study.
- o Application for and pursuit of accreditation for B.S. equivalent degree training.

- o An expanded work/scholarship opportunity for fourth year students to defray the direct and opportunity costs of the additional year.
- o A careful review and expansion of the mission statement of EAP.
- o Additional administrative and support staff to manage the complexities brought about by an altered educational program and the expansion of student numbers through retention of a portion of students for the fourth year of study.

Consequences:

- o Added staff, courses, and services will increase the cost per student at EAP.
- o Two segments of the labor market (those seeking technicians and those seeking B.S. equivalent degree students) will be served, thus expanding the influence of EAP on the labor markets of Central America.
- o Some segments of the labor market which now employ primarily persons with B.S. equivalent degrees (education, credit institutions, etc.) will absorb a larger share of EAP graduates, thus changing the first-job profile of graduates.
- o There may be some social divisions among the student body between those in diploma study and those who continue for a B.S. equivalent degree, depending on how the program is structured.

- o Employers of B.S. equivalent degree students may expect a greater emphasis on knowledge, principles, and theory and place less value on the ability of students to be able to actually perform skills and competencies, with the effect that the hands-on experience emphasized at EAP will be perceived to have less value for B.S. equivalent degree candidates.
- o With an altered system of education, it may be more difficult for administration, faculty, and staff to understand and communicate the mission of the institution.
- o With high costs of instruction, there may be a lack of students who can afford EAP education unless there is a major expansion of scholarships and student support.

b. Alternative Two: Convert EAP to a B.S. equivalent degree granting institution. Through an expansion of curriculum, faculty, staff, facilities, and services, convert the current three-year EAP agronomo program to a four-year B.S. degree equivalent level program.

Evidence:

- o The EAP program is already rigorous and highly respected in Central America.
- o Employers project an increased demand for B.S. level graduates almost equal in number to the expanded need for technician-level personnel.
- o Many graduates of EAP continue study for a B.S. equivalent degree.

- o Graduates who thought a B.S. equivalent degree was important elected EAP as their first choice of a location for training.
- o Lack of title was frequently cited as a deficiency by EAP graduates.
- o Faculty and staff have the level of education commensurate with B.S. equivalent preparation as found in most small colleges of agriculture.
- o Some employers suggested that the agronomo level was not adequate to meet their employment needs.
- o While employees perceived the future supply of B.S. level graduates to be adequate or in surplus, the high quality of EAP graduates and the reputation of the school would still put EAP graduates in a competitive position.
- o Employers generally expect future employees to be more highly skilled than was true of past employees.

Modifications necessary:

Modifications necessary to implement this change are essentially the same as presented for Alternative One, offering a B.S. equivalent degree for selected students. Differences will occur as follows.

- o A larger number of specialization areas with advanced courses.

- o More financial assistance to accommodate all students.
- o Simplified administration to one system for all students.

Consequences

- o It is unlikely that EAP could maintain the intensive hands-on experience program if the focus were shifted to B.S. equivalent degree training.
- o Graduates would compete only in the B.S. level market, a market employers perceive to be adequately supplied or oversupplied.
- o Changing the mission of the school would, over time, change the characteristics of the kind of student attracted to EAP.
- o EAP is now a unique institution in Central America. Changing the mission would put EAP in a larger fraternity of schools in Central America that have similar missions and compete in the same job markets and for the same students.
- o Expansion of faculty, staff, facilities, and services would require a larger operating budget.
- o The loss of the unique character of EAP would make it less competitive for students who have more choices of B.S. level institutions.

- o If the nature of training reduced the emphasis on hands-on experience, there would be an increased need for a larger employed work force to conduct the day-to-day operation of the production enterprises.

- o Higher costs per graduate would require more attention to student aid in the form of scholarships or work opportunities.

Only the most likely options for organization of EAP have been included in this analysis. Obviously, there are others. The key to the selection of any option for change is the precision with which the mission of EAP will be defined and the willingness of the board of directors to assess carefully the likely consequences of any change. To aid in defining consequences, a short list has been suggested for each alternative. Other consequences not defined may be of equal importance in guiding the decision of the board as to the future direction of EAP. Faculty, school administration, and board members may justifiably disagree with some of the recommended modifications or the consequences. Some of these areas of judgment are intended to be constructively provocative. Providing guidance for the decision-making framework is the objective upon which this study focused.

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II. INTRODUCTION

Effective planning for development requires knowledge of immediate and projected manpower needs in all sectors of the tropical Latin American economy. Since agriculture and its related activities employ by far the greatest number of people in most developing countries of Latin America, knowledge of the demand for agriculturally trained manpower and the sources for training to meet the demand are of prime concern to Latin American schools and colleges of higher education. The quality and type of training must fit the direction of development the agricultural industry is taking, beginning with improving production and following with processing and distribution and related services.

Escuela Agricola Panamericana (EAP) has successfully trained agricultural manpower for tropical America for many years. "The prime purpose of EAP is to offer to young men and women a high quality university level of education in the scientific, technological, and managerial aspects of tropical agriculture." The objectives of the school are strongly oriented to the practical needs of tropical agriculture, the student, and the region. The motto of "Aprender Haciendo" connotes the basic principles upon which the school was founded and upon which rests the school's success.

The trustees of EAP are acutely aware of the rapidly changing world and want to ensure that EAP continues to make an outstanding contribution to the region in the future. They have sensed the need to evaluate their existing program and the need to design an educational format for the years ahead that will serve Latin America and preserve the reputation of the school as a responsive pre-eminent institution for the training of agricultural professionals. The board has raised major questions in the areas of:

- o The need for trained agricultural manpower in the future,
- o The niche of the demand for trained agricultural manpower that EAP should supply,
- o The sources of information to help make major decisions, and
- o Explicitly, should EAP become a four-year, college-level institution?

A review of literature reveals little in the way of quantitative or quality dimensions of future agricultural manpower demand in Latin America that is directly applicable to the questions raised by the EAP board of trustees.

The literature tends to deal either with broad levels of education, education's contribution to development, or with the methodological issues in manpower planning. Some of the issues raised are useful to review.

First is the basic effort to include manpower needs planning as a guide to broad actions of governments or their donor agencies in educational projects. The information to be used in planning is a part of the issue. The procedures for estimating manpower needs have been criticized by scholars based on their lack of accuracy or based on the limited contribution that future manpower estimates make to the overall subject of manpower planning. While this is an issue related to those raised by the EAP trustees, it is not directly helpful for a school such as EAP that supplies a very small percentage of its market and seeks to do so in a unique manner for a special niche of the market.

Second, it is common to use numerical estimates of manpower requirements as a foundation for educational planning. The estimates tend to be prepared by estimating growth in an industry and then associating a certain increase in employment with each unit increase in growth in the industry. A debate exists regarding the limitations of an analysis that attempts to specify a numerical manpower requirement. Scholars argue that this method, while useful for specifying the need for teachers or nurses as they relate to demographics and to political decisions, is much less dependable for market driven industries. These manpower requirement estimates are often received with considerable skepticism by decision makers in education.

Surveys of employers regarding future needs are recognized as another source or method of estimating future manpower requirements. However, the record shows that employers are not good predictors. This is true largely because they rarely prepare employment forecasts and therefore have little experience at it.

Third, in a recent collection of World Bank working papers, the authors suggest using a wide range of analytical methods in a continuous planning process to optimize education investment. Cost benefit analysis, focus on the occupation rather than education, and tracer studies are suggested supplements to the usual manpower requirement analyses. Tracer studies refer to administering questionnaires to graduating students and following up with the same group when they are employed to evaluate the impact of education on earnings and employment. The focus for tracer studies is education institutions and therefore provides these institutions with specifically useful information.

The design of the EAP study has recognized the value of a range of approaches, most of which have been briefly reviewed above. Fundamentally, EAP is concerned with the market for its services. It is important to recognize that this market has two components.

- o One is the market for its graduates and agriculturally trained people in general. The demand for EAP services is, in part, derived from this demand. However, this demand component is an indirect one since employers do not pay the tuition at EAP.
- o The second component may be equally critical. It is the direct demand for EAP educational services based on the buyer's perception of desirability of the educational services supplied. The buyers are the new students and their financial supporters. Their perceptions of the value of the EAP education may be as important a factor to EAP as the manpower market for graduates.

In this study, a survey of employers was undertaken to help clarify the understanding of the demand for graduates. The survey of graduates is undertaken to represent a "reasonable substitute" for the students who would be buyers of EAP's educational services in the future. These former students likely are more suitable representatives of the direct demand than future students because of their experience at the school and in the marketplace. Therefore, this study develops substantial information about the two components of demand for the services supplied by EAP. In addition, qualitative aspects of demand in the form of skills, attitudes, and competencies are given special attention.

Three key questions regarding the education of current and future manpower for agriculture and agribusiness were addressed in the study:

1. What are the appropriate instructional disciplines?
2. What are the specific competencies needed in these disciplines?

3. When is the certificate, diploma, or degree the most appropriate level of preparation for professionals working in various parts of the agricultural sector?

EAP serves an important training function for students from the countries of Belize, Bolivia, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Peru, and Venezuela. All graduates for whom addresses could be obtained were included in the mail survey. For efficiency, interviews for the study were restricted to the countries that have had EAP graduates during the past eight years in sufficient numbers to contribute to the determinations of employment demand and supply. Consequently, interviews of graduates and employers were scheduled for Belize, Colombia, Costa Rica, Dominican Republic, Ecuador, Guatemala, Honduras, Nicaragua, and Panama. Attempts to secure personal interviews in Nicaragua were not successful.

III. OBJECTIVES

The general objective of the study was to identify the most appropriate educational niche for EAP in the agricultural education needs of tropical America. More specific objectives included:

1. Identification of the future needs for agricultural training in the region considering the growth of the economy; the relative growth of the agricultural sector; and the expected technological, social, and cultural changes affecting the agricultural sectors;
2. Identification of the most useful training that EAP can provide given the demand of agricultural industry and government and the training supplied by other educational institutions in the region;
3. A determination of the merits, from the points of view of former students and the employing industry, of EAP making modifications in the program, including deletions from the present curriculum, addition of new curriculum thrusts, changes in the mix of theory and practice, or adjustments in the length of the programs.

IV. SUMMARY OF PROJECT STUDY METHODOLOGY

The primary activities of the project study included a mail survey of EAP graduates, personal interviews of graduates, personal interviews of employers of EAP graduates and other employers, and an evaluation of EAP programs. Secondary activities included a survey of selected institutions supplying agricultural manpower and a review of previous studies related to agricultural manpower in the region.

Procedures to locate graduates and employers were developed from vocational education studies conducted in Minnesota and adapted to conditions existing at EAP and in Latin America. Innovative sampling techniques were based on random selection to eliminate bias. Personal interviews were grouped to permit data collection from EAP graduates and employers in the same geographical location.

Initially, addresses of graduates were provided by the school and a mail survey was made of over 1,300 of the 2,142 EAP graduates since the school began in 1946. Assistance in locating addresses and the first mailing was provided by the director of EAP, its faculty, and alumni chapter officers, Asociacion de Graduados de la Escuela Agricola Panamericana (AGEAP) country representatives. Subsequent mailings and personal contacts resulted in a response of 374 returns, the data from which were used for analyses.

Mail survey responses provided names and addresses of employers of EAP graduates who were subjects for interview. Interviewers for this activity were selected from 1984 graduates of EAP. The selection and training of these interviewers were made possible with the aid of Zamorano staff and alumni. A second group of agricultural/agribusiness employers, those not

known to employ EAP graduates, was selected for interview in a random process to collect data similar to data gathered from EAP employers. Instruments used in data gathering were developed and tested among the members of the Experience, Incorporated research team and subjects in various locations in Latin America. Except in Belize, all survey instruments used in data collection were in Spanish.

Another study, conducted among EAP faculty, permitted a comparison to employers' assessments of employee competency. Levels of performance of competencies taught at EAP were compared in eight categories of agriculture/agribusiness, with performance levels of employees when entering employment. Employers also provided assessments of preferred and future expected levels of performance. In addition to the qualitative analyses of the EAP program and the employment market for graduates, a quantitative analysis was made to determine present and future supply and demand. Other assessments were made of EAP physical facilities and staff.

Literature was searched for agricultural manpower studies in Latin America, and macro economic analyses were reviewed. Visits were made to selected agricultural colleges, and personal interviews were conducted to obtain an understanding of other programs similar to EAP.

A detailed explanation of project methodology may be found in Appendix A.

V. GRADUATE RESPONSE FINDINGS

In setting the course for the school's future, the Trustees must understand the graduate's perception of his/her EAP education. Deficiencies or redundancies identified by graduates are logical targets for change. The graduate's satisfaction with the contribution of the education to his/her employment is of special importance. Other valuable information was also available from the graduate survey. The data objectives achieved from the graduate survey include the following:

1. Provided data on present employment such as employer, location of job, job title or description, and employment history since graduation from EAP.
2. Provided a mechanism to receive permission from the graduate to interview his/her employer to discern measures of satisfaction with the employee and other employer views.
3. Provided brief measures of perceptions of the satisfaction each graduate had with the training he/she received at EAP in each of the categories of competence that are used in this study.
4. Determined the strengths and weaknesses in his/her EAP training.

A. Post-graduate Employment and Education

Two important factors to consider in examining the graduates of EAP are: (1) the placement of graduates in the work force, and (2) the education they have obtained after leaving EAP. It

is recognized that the jobs or positions currently held by graduates may not be the same jobs they previously held. If economic forces are working normally, there should be some mobility within the work force by EAP graduates. Some may, through job promotion and betterment, be taking advantage of the opportunity to change careers. Job change may also occur as a result of increased education or training that prepares for lateral or upward mobility within the work force.

1. Employment Status

The current segment of the work force in which the graduate is employed is shown in Table V-1 according to the year in which the student graduated.

Almost every graduate responding to the survey is either working or engaged in further education. Of the 374 respondents, only 6, or less than 2 percent, would be classified as unemployed.

Of the total number of respondents only 9, or less than 3 percent, are working in business engaged primarily in marketing and distribution. About 30 percent are employed in some phase of agricultural production. Public sector employment through the government or in education positions accounts for almost a third (32.6 percent) of the respondents. Over 14 percent of graduates are employed in the supply and service segment of the work force.

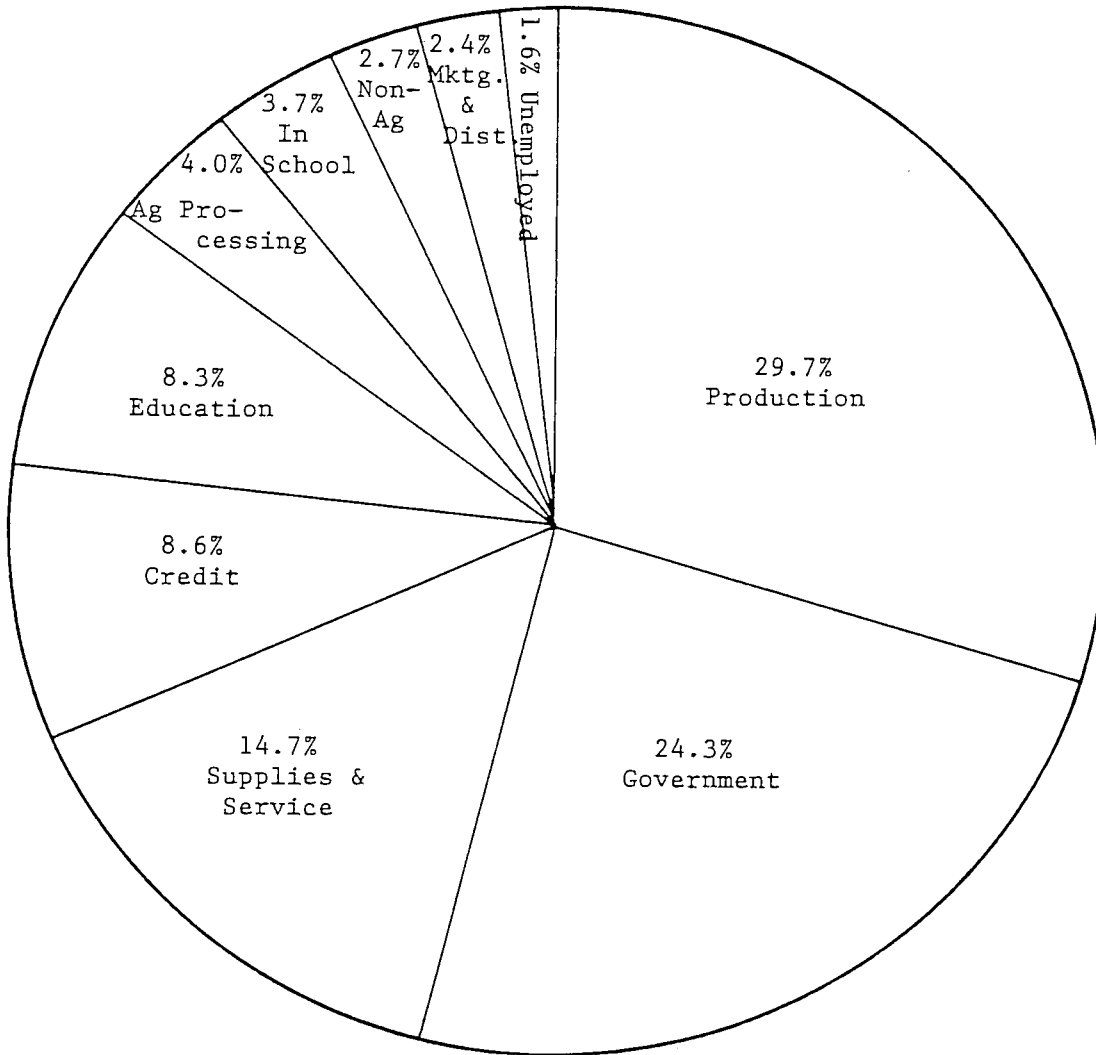
TABLE V-1. CURRENT EMPLOYMENT TYPE OF EAP GRADUATES BY WORK FORCE SEGMENT AND YEAR OF GRADUATION

Year of Graduation	CURRENT JOB TYPE									Total
	Ag. Prod.	Ag. Proc.	Mkt. & Dist.	Sup. & Serv.	Credit	Education	Gov't.	Non Ag.	Student Unemployed	
1983	12	1	0	5	0	9	8	1	4	40
1982	12	1	1	1	2	2	3	1	3	26
1981	11	2	0	6	2	3	4	2	3	33
1980	11	1	0	1	4	2	6	1	1	27
1979	10	2	1	1	1	1	7	0	2	25
1978	5	1	1	4	3	0	10	1	3	28
1977	9	0	0	8	2	0	10	0	2	31
1976	3	1	0	2	4	0	3	1	0	14
1968-75	12	3	3	7	6	5	18	1	1	56
Prior to 1968	<u>26</u>	<u>3</u>	<u>3</u>	<u>20</u>	<u>8</u>	<u>9</u>	<u>22</u>	<u>2</u>	<u>1</u>	<u>94</u>
TOTAL	111	15	9	55	32	31	91	10	20 a/	374

a/ 14 graduates are enrolled in school leaving only 6 without employment at the time of the survey.

The distribution of graduates within the various categories of employment is displayed in Figure V-1.

FIGURE V-1. CURRENT EMPLOYMENT OF EAP GRADUATES



There is no consistent pattern or trend among years of graduation. Recent graduates are dispersed among the various segments of business in about the same distribution as earlier graduates.

As one would expect, there is a difference in the job classification of graduates between the more recent graduates and those of earlier years, as shown in Table V-2. There is a distinct difference between graduates since 1977 as compared to the graduates of classes of 1976 or before. Over 60 percent of the graduates of the early classes are employed as managers, administrators, supervisors, or members of research teams, while approximately 42 percent of the more recent graduates are in those respective job categories. The distribution of graduates within various job classifications is shown in Figure V-2.

Only five of the graduates reported to have jobs that would be classified as non-agricultural. It should be noted that fewer graduates have been classified in non-agricultural jobs than have been classified in non-agricultural segments of industry. This should be an indication that there are some opportunities for agricultural employment even in industries that are not agriculturally based, e.g., an agricultural loan officer in a non-agricultural credit institution or a groundskeeper/gardener in a hospital complex. However, less than 2 percent of the graduates are in such positions, indicating that, at present, this kind of employment is not a major factor in the demand for agriculturally trained personnel.

None of the respondents reported employment in the "operator" classification, indicating that graduates are finding employment in job classifications more appropriate to their knowledge and skills or that fewer opportunities exist for this type of employment in Latin America. Likewise, only a few graduates reported jobs as salespersons. This low response is consistent with the fact that only a few (9 of 374) are employed in businesses where the primary function is marketing and distribution.

FIGURE V-2. DISTRIBUTION OF GRADUATES BY JOB CLASSIFICATION

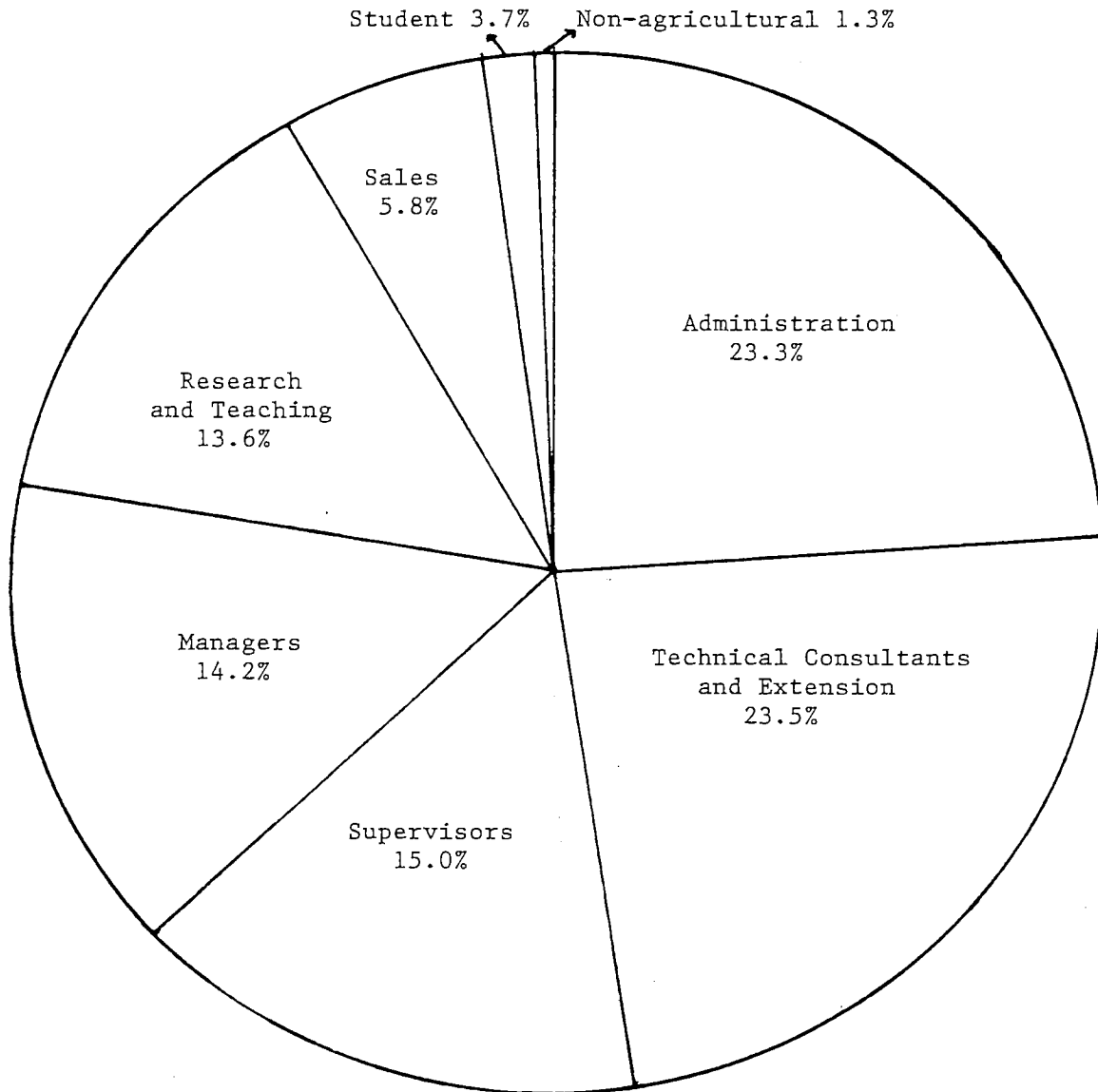


TABLE V-2. CURRENT EMPLOYMENT CLASSIFICATION OF EAP GRADUATES

	CURRENT JOB CLASS									Total
	Admin.	Mgr.	Supervisor	Sales	Tech. Consult. Extension	Research/ Teaching	Operator	Non Ag.	Student	
1983	8	2	2	5	8	11	0	2	2	40
1982	9	3	3	0	6	2	0	0	3	26
1981	7	3	7	5	5	4	0	0	2	33
1980	5	1	10	0	4	5	0	1	0	27
1979	4	1	5	1	8	4	0	0	2	25
1978	3	4	3	3	11	1	0	0	3	28
1977	5	3	4	3	12	2	0	1	1	31
1976	3	3	2	1	5	0	0	0	0	14
1968-75	14	13	7	0	13	8	0	0	1	56
Prior to 1968	<u>29</u>	<u>20</u>	<u>13</u>	<u>1</u>	<u>16</u>	<u>14</u>	<u>0</u>	<u>1</u>	<u>0</u>	<u>94</u>
TOTAL	87	53	56	19	88	51	0	5	14	374
Percentage	23.3	14.2	15.0	5.8	23.5	13.6	0	1.3	3.7	100.0

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Judging from the kind of jobs held by graduates since 1981, there is a fairly consistent distribution of graduates among the various classifications of jobs. Except for the categories of sales and research/teaching, they are employed in about the same proportions among the various job classifications as are the total number of respondents in the sample.

By carefully analyzing the data to determine the first job held after graduation, it was possible to determine the segment of the agricultural sector in which the graduate first found employment. The results of this analysis are exhibited in Table V-3.

Clearly, two segments of the agricultural sector provided the majority of employment. Production agriculture provided 36.6 percent of the initial employment, while government agencies provided employment for 32.1 percent. Though no clear pattern in first employment could be established over the period of the study, it may be important to note that in five of the past six years, the percentage of students employed in production agriculture was above the study mean, while in the same period in four of six years, employment in government agencies was below the mean. This may suggest either less interest in government jobs on the part of EAP students in recent years or inability of government to pay competitive salaries to employees without an Ing. Agronomo or equivalent degree.

Also of interest is the fact that 58.1 percent of those who were initially employed in education were graduates of the past three years. This might indicate greater opportunity for employment in this area or that education could be a starting point which leads to later employment in other areas of agriculture.

TABLE V-3. FIRST EMPLOYMENT TYPE AFTER GRADUATION FROM EAP BY YEAR OF GRADUATION, AND SEGMENT OF THE AG SECTOR ^{a/}

	1983	1982	1981	1980	1979	1978	1977	1976	1968-75	Prior to 1968	Row Totals
Student	50.0 2 5.0	25.0 1 3.8	0.0 0 0.0	0.0 0 0.0	0.0 0 0.0	0.0 0 0.0	0.0 0 0.0	0.0 0 0.0	0.0 0 0.0	25.0 1 1.1	100.0 4 1.1
Agricultural Production	10.2 14 35.0	10.2 14 53.8	13.1 18 54.5	9.5 13 48.1	7.3 10 40.0	8.0 11 39.3	6.6 9 29.0	4.4 6 42.9	14.6 20 35.7	16.1 22 23.4	100.0 137 36.6
Agricultural Processing	0.0 0 0.0	9.1 1 3.8	0.0 0 0.0	0.0 0 0.0	18.2 2 8.0	18.2 2 7.1	0.0 0 0.0	0.0 0 0.0	18.2 2 3.6	36.4 4 4.3	100.0 11 2.9
Marketing & Distribution	0.0 0 0.0	12.5 1 3.8	12.5 1 3.0	0.0 0 0.0	12.5 1 4.0	0.0 0 0.0	0.0 0 0.0	12.5 1 7.1	25.0 2 3.6	25.0 2 2.1	100.0 8 2.1
Supplies & Services	11.1 3 7.5	0.0 0 0.0	14.8 4 12.1	0.0 0 0.0	0.0 0 0.0	3.7 1 3.6	14.8 4 12.9	3.7 1 7.1	11.1 3 5.4	40.7 11 11.7	100.0 27 7.2
Credit	3.2 1 2.5	9.7 3 11.5	0.0 0 0.0	12.9 4 14.8	12.9 4 16.0	8.5 2 7.1	3.2 1 3.2	6.5 2 14.3	16.1 5 8.9	29.0 9 9.6	100.0 31 8.3
Education	38.7 12 30.0	9.7 3 11.5	9.7 3 9.1	0.0 0 0.0	3.2 1 4.0	0.0 0 0.0	0.0 0 0.0	3.2 1 7.1	6.5 2 3.6	29.0 9 9.6	100.0 31 8.3
Government Agency	6.7 8 20.0	2.5 3 11.5	4.2 5 15.2	8.3 10 37.0	5.8 7 28.0	8.3 10 35.7	14.2 17 54.8	1.7 2 14.3	18.3 22 39.3	30.0 36 38.3	100.0 120 32.1
Non-agriculture	0.0 0 0.0	0.0 0 0.0	40.0 2 6.1	0.0 0 0.0	0.0 0 0.0	40.0 2 7.1	0.0 0 0.0	20.0 1 7.1	0.0 0 0.0	0.0 0 0.0	100.0 5 1.3
TOTALS	10.7 40 100.0	7.0 26 100.0	8.8 33 100.0	7.2 27 100.0	6.7 25 100.0	7.5 28 100.0	8.3 31 100.0	3.7 14 100.0	15.0 56 100.0	25.1 94 100.0	100.0 374 100.0

^{a/} First figure - percent of each class
 Second Figure - row number of each class
 Third number - percent of each year

42

On comparing data on first employment to current employment, it is obvious that the most change in segment employment occurred in agricultural production and in government agencies. Employment in these sectors of EAP graduates declined as graduates moved into positions in the other areas.

Based upon the descriptions or title of the job provided by the graduate, each first job was classified in one of eight categories. These categories were the same ones used to classify current employment. The kind or class of first employment by EAP graduates is exhibited in Table V-4. The most frequent job class reported was the category of technician, consultant, or extension, where 38.6 percent of the graduates found employment. Administrator and manager, two job classes normally requiring experience, were not as frequently cited for the first job class as they were for the current job class (Table V-2).

To test the hypothesis that graduates of EAP are highly mobile within the work force, an analysis was made of current jobs in relationship to previous jobs held to determine if there was much movement from area to area within the agricultural sector. This analysis is presented in Table V-5.

All analyses are based upon the current job held by the EAP graduate in relation to previous employment. When the category of the current job matched the category of the prior job, the analysis differentiates among those who are working for the same employer and those who have a different employer from the same segment of the agricultural sector. To illustrate, under agricultural production (current job) and agricultural production (previous job) respondents indicated that 48 changed employers within the agricultural production segment and 48 still worked for the same employer. In addition, one had a previous job in agricultural processing, one was previously employed in marketing and distribution, three moved to agricultural production from supplies and service, etc.

TABLE V-4. FIRST JOB CLASS BY YEAR OF GRADUATION: EAP GRADUATES a/

First Job Class	1983	1982	1981	1980	1979	1978	1977	1976	1975-68	Prior to 1968	Row Totals
Student or Unemployed	50.0	25.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	25.0	100.0
	2	1	0	0	0	0	0	0	0	1	4
	5.0	3.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	1.1
Administrator	13.1	16.4	14.8	9.8	1.6	6.6	3.3	1.6	11.5	21.3	100.0
	8	10	9	6	1	4	2	1	7	13	61
	20.0	38.5	27.3	22.2	4.0	14.3	6.5	7.1	12.5	14.0	16.4
Manager	6.7	6.7	6.7	3.3	6.7	6.7	3.3	3.3	13.3	43.3	100.0
	2	2	2	1	2	2	1	1	4	13	30
	5.0	7.7	6.1	3.7	8.0	7.1	3.2	7.1	7.1	14.0	8.0
Supervisor	4.8	6.5	9.7	14.5	9.7	3.2	8.1	4.8	16.1	22.6	100.0
	3	4	6	9	6	2	5	3	10	14	62
	7.5	15.4	18.2	33.3	24.0	7.1	16.1	21.4	17.9	15.1	16.6
Sales	16.7	0.0	33.3	0.0	0.0	8.3	8.3	8.3	0.0	25.0	100.0
	2	0	4	0	0	1	1	1	0	3	12
	5.0	0.0	12.1	0.0	0.0	3.6	3.2	7.1	0.0	3.2	3.2
Technicians, Consultants, Extension	7.6	4.2	4.9	5.6	8.3	11.1	12.5	4.9	17.4	23.6	100.0
	11	6	7	8	12	16	18	7	25	34	144
	27.5	23.1	21.2	29.6	48.0	57.1	58.1	50.0	44.6	36.6	38.6
Research, Teaching	21.4	5.4	8.9	3.6	7.1	5.4	7.1	1.8	16.1	23.2	100.0
	12	3	5	2	4	3	4	1	9	13	56
	30.0	11.5	15.2	7.4	16.0	10.7	12.9	7.1	16.1	14.0	15.0
Operator	0.0	0.0	0.0	25.0	0.0	0.0	0.0	0.0	25.0	50.0	100.0
	0	0	0	1	0	0	0	0	1	2	4
	0.0	0.0	0.0	3.7	0.0	0.0	0.0	0.0	1.8	2.2	1.1
COLUMN TOTALS	10.7	7.0	8.8	7.2	6.7	7.5	8.3	3.8	15.0	24.9	100.0
	40	26	33	27	25	28	31	14	56	93	373
	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

a/ First figure - percent of each class
 Second figure - row number of each class
 Third number - percent of each year

TABLE V-5. JOB MOBILITY OF EAP GRADUATES' MOVEMENT BETWEEN INDUSTRY SECTORS FROM PREVIOUS JOB TO CURRENT JOB

Current Job	Previous Job									Total
	No Previous Job	Ag. Prod.	Ag. Proc.	Mkt. & Dist.	Sup. & Serv.	Credit	Education	Gov't.	Non-Ag	
Students/Unemployed	3	4	0	1	1	2	1	8	0	20
Ag Production		48 <u>a/</u> 48 <u>b/</u>	1	1	3	4	0	6	0	111
Ag Processing		4	6 <u>a/</u> 2 <u>b/</u>	0	0	1	0	2	0	15
Mkt. & Dist.		1	0	1 <u>a/</u> 5 <u>b/</u>	1	0	0	1	0	9
Sup. & Serv.		11	1	0	27 <u>a/</u> 9 <u>b/</u>	1	2	4	0	55
Credit		2	2	0	1	12 <u>a/</u> 8 <u>b/</u>	1	6	0	32
Education		5	0	1	0	0	12 <u>a/</u> 12 <u>b/</u> 12 <u>c/</u>	1	0	31
Government		7	1	1	3	2	5	49 <u>a/</u> 23 <u>b/</u>	0	91
Non-Ag		2	0	0	2	1	1	1	5 <u>a/</u> 0 <u>b/</u>	10
TOTAL		132	13	10	47	30	33	101	5	374

a/ A previous job in this sector

b/ Same employer as first job

I/8230A

The two categories of agricultural production and government show the most job movement or mobility from previous jobs to current jobs. In agricultural production, 36 graduates who held a previous job in agricultural production now work in some other category. Of those who previously worked in government, 29 now work in some other segment of the agricultural sector. Only 15 graduates moved into the agricultural production sector from some other agricultural segment, while 19 moved into government positions from other employment.

Perhaps most striking is the stability of the work force. Of the 374 respondents, almost 30 percent of the employees have had no other employer. Another 40 percent changed employers but within the same segment of the agricultural sector. Only 30 percent of the graduates moved from one major segment of the agricultural sector to another during the period covered by this study.

2. Continuing Education

Of the graduates of Zamorano in this study, 123 of the 374 (32.8 percent) have gone on to complete a B.S. degree as reported in Table V-6. Only one respondent who reported university study beyond EAP indicated he did not have a B.S. degree. One graduate had an M.S. degree completed, while 11 of those responding are currently enrolled in an advanced degree program.

There does not seem to be a trend over the years. No doubt opportunity and other factors have influenced the pursuit of an advanced degree. The availability of financial assistance either by scholarship or grants has probably played an important part in the decision to enroll in a graduate program, since most preferred to attend in countries other than where they were employed.

TABLE V-6. POST-EAP DEGREE EARNED IN UNIVERSITY STUDY

	No Answer	Ingeniero Agronomo B.S.	Master's	Ph.D.	Currently Enrolled	Total
1983	39	1	0	0	0	40
1982	19	3	0	0	4	26
1981	18	15	0	0	0	33
1980	21	6	0	0	0	27
1979	17	3	1	0	4	25
1978	16	11	0	0	1	28
1977	17	13	0	0	1	31
1976	9	5	0	0	0	14
1968-75	30	25	0	0	1	56
Prior to 1968	<u>53</u>	<u>41</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>94</u>
TOTAL	239	123	1	0	11	374

8417A

TABLE V-7. POST-EAP UNIVERSITY STUDY: LENGTH OF STUDY

Year of Graduation	None	Less than 1 Year	1 to 2 Years	2 to 3 Years	3 to 4 Years	Total
1983	39	1	0	0	0	40
1982	19	1	6	0	0	26
1981	18	5	9	1	0	33
1980	17	5	5	0	0	27
1979	16	2	6	1	0	25
1978	15	5	6	1	0	27
1977	17	3	9	1	1	31
1976	9	2	3	0	0	14
1968-75	29	6	16	5	0	56
Prior to 1968	<u>47</u>	<u>10</u>	<u>30</u>	<u>5</u>	<u>1</u>	<u>94</u>
TOTAL	226	40	90	14	2	373

8417A

Of the 136 students who reported post-Zamorano study, 146 different study episodes were reported (Table V-7). Forty respondents reported less than a year, while ninety reported between one and two years of university study.

Sixteen graduates have had more than two years of university study. Of that sixteen, two have had extensive study beyond two years but less than three years. Both have graduated 8 and 10 years ago and have apparently continued to seek improved professional development through university study.

Approximately 10 of the graduates attended more than one university in pursuit of a B.S. degree.

TABLE V-8. POST-EAP UNIVERSITY STUDY: PLACE OF STUDY FOR THE B.S. DEGREE

	None Listed	University of Florida	Other U.S.	Latin America	Other	Total
1983	39	0	1	0	0	40
1982	20	2	2	2	0	26
1981	18	11	0	4	0	33
1980	19	2	3	3	0	27
1979	17	2	1	5	0	25
1978	14	8	3	2	1	28
1977	20	6	2	3	0	31
1976	8	4	0	2	0	14
1968-75	34	3	11	8	0	56
Prior to						
1968	<u>51</u>	<u>18</u>	<u>19</u>	<u>6</u>	<u>0</u>	<u>94</u>
TOTAL	240	56	42	35	1	374

8417A

The graduates who listed their place of study (Table V-8) were quite evenly distributed among the University of Florida, other United States universities, and Latin American universities.

The University of Florida in 1981, and other United States universities in the years 1968-75, were reported as the places of study by 11 graduates. Perhaps there were opportunities at other universities that made those particular years somewhat different from the more recent years where the place of study is more diverse. Perhaps there were other incentives at the University of Florida in 1981.

TABLE V-9. POST-EAP STUDY: AREA OR PROGRAM OF STUDY

	None Listed	Agri- cultural	Edu- cation	Admin- istrative	Other	Total
1983	39	1	0	0	0	40
1982	19	6	0	1	0	26
1981	18	15	0	0	0	33
1980	17	8	0	0	2	27
1979	15	7	0	3	0	25
1978	15	9	4	0	0	28
1977	17	13	0	1	0	31
1976	8	5	0	1	0	14
1968-75	28	26	1	1	0	56
Prior to 1968	<u>46</u>	<u>45</u>	<u>0</u>	<u>0</u>	<u>3</u>	<u>94</u>
TOTAL	222	135	5	7	5	374

8417A

Some EAP graduates reported study in more than one area program. The vast majority (135) continued post-EAP study in agricultural fields. Five graduates reported doing post-EAP work in education, seven in administration, and five in other non-related areas as reported in Table V-9.

The large number pursuing further study in agriculture is understandable since their EAP training has been a broad comprehensive program covering all areas of agriculture. The background of EAP graduates prepares them to be able to elect many different specializations in the broad field of agriculture.

TABLE V-10. POST-B.S. EQUIVALENT DEGREE STUDY: LENGTH OF STUDY

	None	1 Years	1-2 Years	2-3 Years	3+ Years	Total
1983	40	0	0	0	0	40
1982	26	0	0	0	0	26
1981	31	1	1	0	0	33
1980	25	1	1	0	0	27
1979	24	0	1	0	0	25
1978	22	2	4	0	0	28
1977	23	0	7	1	0	31
1976	11	1	2	0	0	14
1968-75	41	3	9	3	0	56
Prior to						
1968	<u>64</u>	<u>6</u>	<u>22</u>	<u>1</u>	<u>1</u>	<u>94</u>
TOTAL	307	14	47	5	1	374

8417A

Sixty-seven of the graduates indicated they had participated in some study following the B.S. equivalent degree study. The largest number, 47 out of the 67, studied from one to two years, whereas only six were in graduate study beyond two years.

The two-year attendance may be explained as being the general length of time to obtain an M.S. degree. Responses from Table V-10 would indicate that most students did not obtain the degree, but the way in which the questionnaire was constructed may have prompted some who had advanced degrees to leave the question on advanced degree attainment blank.

No response for years 1982 and 1983 could be explained by the fact that graduates cannot enroll in a graduate program until they have a B.S. degree and in some cases additional professional work experience.

TABLE V-11. POST-B.S. EQUIVALENT DEGREE STUDY: PLACE OF STUDY

	None	Florida	Other U.S.	Latin America	Other	Total
1983	40	0	0	0	0	40
1982	26	0	0	0	0	26
1981	31	0	1	1	0	33
1980	26	0	0	1	0	27
1979	25	0	0	0	0	25
1978	23	0	3	1	1	28
1977	25	1	1	4	0	31
1976	10	1	1	1	1	14
1968-75	44	0	7	5	1	56
Prior to 1968	<u>68</u>	<u>8</u>	<u>9</u>	<u>8</u>	<u>0</u>	<u>94</u>
TOTAL	318	10	22	21	3	374

8417A

The 56 graduates responding to the question about location of post-B.S. equivalent degree study attended a wide variety of institutions both in the United States and in Latin America. It is interesting to note that while the University of Florida was selected by more students than any other place to study for the B.S. degree (56 of 134), at the post-EAP study level, only 10 of the 56 who studied for advanced work chose Florida. The place of study by year of graduation from EAP is shown in Table V-11.

TABLE V-12. POST-B.S. EQUIVALENT DEGREE STUDY: AREA OF PROGRAM

	None	Ag	Education	Admin.	Other	Total
1983	40	0	0	0	0	40
1982	26	0	0	0	0	26
1981	31	2	0	0	0	33
1980	25	0	0	1	1	27
1979	24	0	0	1	0	25
1978	22	3	1	2	0	28
1977	23	3	0	4	1	31
1976	10	4	0	0	0	14
1968-75	41	8	0	6	1	56
Prior to						
1968	<u>65</u>	<u>27</u>	<u>0</u>	<u>0</u>	<u>2</u>	<u>94</u>
TOTAL	307	47	1	14	5	374

8417A

Forty-seven of the sixty-seven people reporting post-B.S. equivalent degree study indicated that they continued in some area of agriculture. Only one person reported majoring in education, while fourteen enrolled in a program in administration.

As in the case of the B.S. degree, the desire to pursue further study in some area of agriculture is probably to be expected from the comprehensive agriculture program at Zamorano. A summary of the areas of study selected is shown in Table V-12.

TABLE V-13. POST-EAP STUDY; NUMBER OF SPECIAL TRAINING WORKSHOPS AND SEMINARS

	None	1-2	3-4	5-6	7	Total
1983	28	9	3	0	0	40
1982	14	10	2	0	0	26
1981	13	18	2	0	0	33
1980	10	12	4	1	0	27
1979	8	13	2	2	0	25
1978	9	11	7	0	1	28
1977	9	17	4	0	1	31
1976	3	6	2	1	2	14
1968-75	17	24	12	3	0	56
Prior to 1968	<u>29</u>	<u>42</u>	<u>8</u>	<u>7</u>	<u>8</u>	<u>94</u>
TOTAL	140	162	46	14	12	374

8417A

EAP graduates reported participating in a number of workshops and seminars in addition to post-EAP and university degree programs. Of the 374 respondents, 162 have attended 1 or 2 special events, 46 attended 3 or 4, 14 attended 5 or 6, and 12 have attended more than 7 special workshops or seminars.

Graduates have been involved in professional improvement on a selective basis according to perceived needs. Tables V-15 and V-16 indicate that for a large number of the graduates a degree was not important, whereas Table V-13 and 14 show the considerable interest in professional improvement on a selective basis.

TABLE V-14. POST-EAP STUDY: DURATION OF SPECIAL TRAINING WORKSHOPS AND SEMINARS

	None	Weeks						Total
		1-5	6-10	11-15	16-20	2-30	30	
1983	29	8	1	1	0	1	0	40
1982	15	3	3	1	2	1	1	26
1981	16	9	2	3	2	0	1	33
1980	11	8	3	1	1	1	2	27
1979	9	5	5	3	2	1	0	25
1978	13	6	0	2	3	0	4	28
1977	11	8	4	2	1	3	2	31
1976	4	4	1	0	1	2	2	14
1968-75	19	17	2	3	1	6	8	56
Prior to								
1968	<u>40</u>	<u>11</u>	<u>5</u>	<u>7</u>	<u>3</u>	<u>8</u>	<u>20</u>	<u>94</u>
TOTAL	167	79	26	23	16	23	40	374

8417A

The number of weeks EAP graduates have attended workshops or seminars varies from one to more than thirty weeks. No pattern or trend is apparent. Each graduating class reported about the same total weeks of workshops or seminars, with those graduating before 1975 reporting a few more total weeks. This is to be expected, since they have been in the field for more years.

The total number of weeks of workshops and seminars being reported is an indication that such training is an important method of providing professional updating.

TABLE V-15. PERCEIVED NEED FOR DEGREE BY EAP GRADUATES WHO HAD OR WERE EARNING A DEGREE

	Number With No Degree	Number With Degree		
		Needed	Not Needed	Total
1983	39	0	1	40
1982	19	1	6	26
1981	16	5	12	33
1980	22	3	2	27
1979	18	2	5	25
1978	12	7	9	28
1977	14	5	12	31
1976	8	0	6	14
1968-75	27	4	25	56
Prior to				
1968	<u>43</u>	<u>21</u>	<u>30</u>	<u>94</u>
TOTAL	218 <u>a/</u>	48	108	374

a/ Includes ten graduates who did not respond to question.
8417A

Two-hundred-eighteen EAP graduates responded that they did not have a degree when asked if they had obtained a degree or were required to get one to avoid having limited opportunities for development. Forty-eight graduates indicated it was necessary to acquire the degree to avoid limiting their opportunities for career development, while 108 persons indicated the degree was not necessary for normal career development. Responses by those who already had or were studying for a degree are reported in Table V-15 by year of graduation.

TABLE V-16. PERCEIVED LIMITATIONS OF HAVING NO DEGREE BY EAP GRADUATES WITHOUT DEGREES

	No Limitation	Has Limited Opportunity	Total
1983	22	15	37
1982	9	9	18
1981	11	5	16
1980	7	14	21
1979	9	9	18
1978	6	6	12
1977	6	7	13
1976	2	6	8
1968-75	14	13	27
Prior to 1968	20	18	38
TOTAL	<u>106</u>	<u>102</u>	<u>208</u>

8417A

EAP graduates without a degree who responded to the question of whether they believed the lack of the university title limited their career opportunities responded about equally; 106 felt they had not been limited, while 102 indicated they believed their opportunities for career development were limited. Responses by year are reported in Table V-16.

While the need for an advanced degree (B.S. equivalent or above) is considered by some to be necessary, this is not an overwhelming perception. Graduates generally responded that the lack of a degree did not limit their opportunities, but it did limit their salaries. The need for a degree is experienced more strongly by those who do not have a degree (102 of 208 respondents) than by those who do (48 of 156). There is no consistent pattern of responses related to the year or time period during which the student graduated.

TABLE V-17. EAP GRADUATES CHOICE OF PLACE TO EARN DEGREE

	None	Zamorano	Another School	Total
1983	1	31	8	29
1982	2	15	9	26
1981	2	22	9	33
1980	0	21	6	27
1979	1	20	4	25
1978	1	23	4	28
1977	0	22	9	31
1976	1	9	4	14
1968-75	5	40	11	56
Prior to 1968	<u>2</u>	<u>76</u>	<u>16</u>	<u>94</u>
TOTAL	15	279	80	374

8417A

When students were asked whether they would prefer to get a university degree at Zamorano or at some other institution, the great majority, 279 of the 374 respondents, indicated a preference for Zamorano. Another 80 would elect another institution. Most did not elaborate on the institution.

The large number favoring Zamorano is understandable since they are familiar with the college and its desirable location. Graduates attending colleges in the United States as well as United States origin faculty at Zamorano give students some contacts and knowledge of possible programs. Other Latin American universities are also considerations for a place to earn a degree.

The response to the question about post-graduate study indicated that 239 of the 374 graduates had not taken any university study beyond EAP graduation. Of those that had participated in advanced study, 123 received either a B.S. in agriculture or an Ingeniero Agronomo degree, while 11 people responded that they are currently enrolled in a university study program. One respondent from the 1979 class had completed an M.S. degree.

The number of graduates reporting where they did their post-graduate work were split about equally between Latin America and United States universities other than Florida. Ten people reported that they had attended the University of Florida. The cooperative arrangement between the University of Florida and Zamorano has no doubt been influential.

Of those graduates reporting, 47 pursued post-graduate work in agriculture, 14 in administration, 1 in education, and 5 in other fields. When looking at all of the post-Zamorano programs, the greatest number (135, or 88 percent of the 152 people) reporting continued their study in some area of agriculture. Seven of the graduates did graduate work in administration and five in education. The remaining five reported advanced work in the other category.

The responses relating the need for a university degree were not strong one way or the other. Forty-eight of those who had degrees said they were a requirement for career development, while 108 indicated they were not necessary. Of those respondents who did not have a degree, 102 felt their opportunities for career development were limited but 106 indicated no limitations because of a lack of a university degree.

Areas of employment no doubt vary as to whether a university degree provides more opportunities for professional growth. Employment in education generally rewards advanced degrees by promotion, but a vast majority of Zamorano graduates are employed in agriculture, where performance criteria would play a more important part in job advancement than would advanced study.

B. Graduates' Perceptions of EAP Program and Environment

Graduates were provided the opportunity to comment on EAP. Many recorded what they particularly liked or disliked about the school. Each comment was carefully read and categorized as to its reference to the program of study or to student life in general. Comments were then categorized, to allow some discussion and analysis by the study team.

Since recent graduates could have different perceptions than earlier graduates, the comments were divided according to time periods of graduation; the last eight years in one group and earlier graduates in another. The comments are summarized in table format in Tables V-18-25.

1. Program of Studies

TABLE V-18. BENEFITS OF PROGRAM STUDIES REPORTED BY EAP GRADUATES OF 1976-83

Rank	No. Responding
1. Good combination of theory and practice	68
2. Well rounded education	28
3. Opportunity to study practical agricultural methods	18
4. Competence in practical agriculture	13
5. Able to work in various areas of agriculture	12
6. No difficulty in finding employment	10
7. Good teachers	6
8. Excellent nutrition courses/animal science	2
9. English courses very useful	2
10. Able to select an area of interest	1
11. Good laboratory experience	1

8417A

The 145 responses of the graduates of the past eight years relate the most important benefits of their study program to the practical application methods involving both technical information and field experiences. The five responses ranked highest by 139 of the 145 respondents all relate the practical emphasis in addition to classroom study. Ten people reported no difficulty in finding a job, which may be a result of the practical training that is part of Zamorano's program.

TABLE V-19. BENEFITS OF PROGRAM STUDIES REPORTED BY ZAMORANOS GRADUATING BEFORE 1976

Rank	No. Responding
1. Combination of course work and field experience	47
2. Well-rounded education	31
3. Hands-on work experience	26
4. Teaches good study and work habits; meet goals; responsibility	14
5. Ability to work in various agricultural areas (diversification)	6
6. Laboratories and library	5
7. Don't know current situation	5
8. Variety of courses/areas of study in program	4
9. No difficulty in post-graduate work abroad due to good basic education at EAP	4
10. Satisfactory	2

8417A

The responses of those graduates before 1976 emphasized the same strengths as the more recent graduates. One hundred eighteen responses refer to the practical hands-on experience associated with classroom and laboratory work for a well-rounded program. Four students also mentioned they had no difficulty in post-graduate work abroad due to good basic education at EAP.

TABLE V-20. DEFICIENCIES OF PROGRAM STUDIES REPORTED BY EAP GRADUATES OF 1976-1983

Rank	No. Responding
1. Lack of title	99
2. Lack of personnel specialized in teaching	33
3. Lack of in-depth study in agricultural mechanics, soils & horticulture	25
4. More courses in agri-computers, marketing, communications, agribusiness & human relations	20
5. No opportunity to specialize in area of interest	9
6. Lack of laboratory facilities - agronomy-animal science	8
7. Artificial insemination course to theoretical	4
8. Lack of competence of personnel in Spanish	4
9. Lack of crop specialization in bananas, coffee, and sugarcane	3
10. No deficiencies	3
11. Teach agriculture technology & methods applied to home country	1

8417A

The most significant response recorded as a deficiency by recent graduates was "Lack of Title: Zamorano education is superior to the present title award." While 10 graduates reported no difficulty in finding a job, the lack of title was thought to be a definite deficiency by 99 of those reporting.

They also reported a need for more courses in agri-computers, marketing, communication, agribusiness and human relations.

There were several other deficiencies noted in the program of studies. The most frequently mentioned was the lack of personnel specialized in teaching. While graduates did not remark about the technical competence of staff, they did express a major concern over the ability of the technical staff to teach. Language skills of staff were also noted, drawing attention to the lack of Spanish skills by some instructors.

Graduates rated their training as deficient in the areas of agriculture mechanics, soils and horticulture. Other deficiencies reported in small numbers tend to deal more with individual concerns with no pattern of consistency.

TABLE V-21. DEFICIENCIES OF PROGRAM STUDIES REPORTED BY ZAMORANOS GRADUATING BEFORE 1976

Rank	No. Responding
1. Needed statistics, farm management, accounting, credit, with practical application; economic production, business administration	39
2. Some professors were not well qualified; most were; needed updating in their areas of study	18
3. No opportunity to specialize	8
4. Needed more math and marketing	8
5. Lack of laboratories and research in some areas	7
6. 33 months is too short a time for in-depth study and other complementary courses to be added	6
7. Too expensive	6
8. EAP should teach agricultural techniques and methods applicable to the different countries where students come from	6
9. Some basic courses were not of high enough level	5
10. Few programs in human relations	4
11. Needed more practice with agricultural machinery	3
12. Don't know present curriculum	3
13. Generally the education was not very good	1
14. Lack technology transfer methods	1
15. Create more scholarships	1

8417A

The same general deficiencies reported by recent graduates were also reported by the early graduates. Both groups reported the need for more marketing, business, credit and statistics, and practice in agricultural mechanics. These areas should be of concern to the administration of EAP since the reports were consistent.

One notable difference between the deficiencies reported by the early graduates and recent graduates is in their criticisms of the qualification of the professors and in techniques of instruction. Recent graduates more frequently reported what they thought were weaknesses in basic teaching skills. Comparing the two groups appears to show that both professor qualifications and teaching methods need to be upgraded.

Many graduates specified curriculum areas that they thought needed strengthening. Graduates also noted the lack of opportunity to specialize.

Also of major interest is the fact that early graduates did not mention the lack of title as a deficiency, while this item was the most frequently expressed by the recent graduates.

2. Student Life

TABLE V-22. BENEFITS OF STUDENT LIFE REPORTED BY EAP GRADUATES OF 1976-83

Rank	No. Responding
1. Discipline and work habits	101
2. Friends from many Latin countries	50
3. Social aspects - learn from others	31
4. More responsible - good habits	17
5. Creates spirit of competition - motivation	13
6. Good place to exchange ideas and develop professional mind	8
7. Teaches to budget time	7
8. Entire system good	6
9. Good activities, many fond memories	5

8417A

The responses of 125 recent graduates referred to the benefits of the disciplined life while a student. One-hundred-one mentioned discipline and work habits, seventeen identified responsible habits, and seven listed learning to budget time as a benefit. Other frequently mentioned benefits referred to friendships and ideas as a result of the different countries represented by the student body.

TABLE V-23. BENEFITS OF STUDENT LIFE REPORTED BY ZAMORANOS GRADUATING BEFORE 1976

Rank	No. Responding
1. Discipline is the major benefit	92
2. Got to know and learn from others of varied backgrounds; learned to accept others as they really are; formed good friendships	58
3. Very beneficial in general	25
4. One develops responsibility	6
5. Students adjusted to studying and future needs	5
6. Maintaining order and cleanliness in the dormitories led to good lifelong habits	3
7. Staying on campus and developing "esprit de corps"	2
8. A brotherly atmosphere	2
9. Good sports facilities and activities	1
10. OK	1

8417A

The number one benefit in both the early graduates and the recent graduates is the discipline they learned as students. The early graduates placed even higher value on the association with persons of varied backgrounds and the friendships they developed while at EAP.

TABLE V-24. DEFICIENCIES OF STUDENT LIFE REPORTED BY EAP GRADUATES OF 1976-83

Rank		No. Responding
1.	None	18
2.	Bad human relations and communications: teacher/student/administration	16
3.	Drugs and alcohol becoming a problem	15
4.	Too short a time for travel and sightseeing in the country	9
5.	Lack of student participation in planning and organizing student activities	6
6.	Few student activities other than sports; lack of social life	4
7.	More attention needed for personal problems	3
8.	Many injustices committed in treatment of females	3
9.	Preferential treatment given to some students	3
10.	Too expensive	3
11.	Students who can afford to "buy" their way past rules and regulations	2
12.	Not enough discipline	1

8417A

Three items were mentioned frequently enough by recent graduates to be of interest to the school's administration. Eighteen graduates, the largest response, said they did not believe there were any deficiencies. But 16 graduates were critical of the human relations and teacher/student/administration communication, and 15 believed drugs and alcohol were becoming a problem. These two problems were mentioned frequently enough to be a concern to the administration.

The item summarized as "many injustices committed in treatment of females" was not received from female graduates, but from three males.

There was some concern expressed about student activities for recreation and social development. Students expressed the need for greater participation in planning social activities.

TABLE V-25. DEFICIENCIES OF STUDENT LIFE REPORTED BY ZAMORANOS GRADUATING BEFORE 1976

Rank	No. Responding
1. None	17
2. Boredom if you were not involved in sports; lack of more cultural entertainment	9
3. Need opportunities to be in an environment like the one that exists outside of school (reality)	8
4. No opportunity for weekend trips outside the school; more social life	7
5. Weak human relations between teachers and students	7
6. Lack of student participation in planning and organizing social activities	5
7. Better orientation; counseling students with personal problems	3
8. Don't know the current situation	3

8417A

The graduates before 1976 had little to report as deficiencies of their student life. Seventeen of the 59 graduates reported no deficiencies. Seven indicated a weakness in the relationship between teachers and students which was also reported by the more recent graduates. Also evident with early graduates was some concern over the social life on campus and the lack of recreational/social activity other than sports. These comments are similar to those made by recent graduates and may indicate an area that needs further study.

In summary the comments on deficiencies revealed nothing unusual. They tended to represent a cross section of thought and feeling that might be found in many advanced education institutions.

3. Miscellaneous Comments By Graduates

Some miscellaneous comments gleaned from all groups are reported below. The most frequent comment related to the lack of a title for the degree; this was reported by 32 graduates. Other comments from Zamorano graduates included expensive tuition, personnel training should be taught, and laboratories and other facilities should be updated.

C. Satisfaction with the EAP Curriculum

1. Related to Employment

Graduates were asked to provide a single response as to their perceived level of satisfaction with the eight applied areas of study in the EAP curriculum both in relation to their current job and in relation to their first job after graduation.

Study program evaluations in relation to their first job are shown in Table V-26. The most widely used skills were in communications and human relations, with 85 percent of the respondents indicating they used the skill or knowledge in their first job. The least used skills and knowledges were in horticulture, with 39 percent of the graduates indicating the skills or knowledges were not used.

The study areas can be divided into three general groups according to use. Most used skills and knowledges were in communications and human relations, soils, and agricultural crop production. The next group consisted of agricultural machinery and agricultural economics. The least used skills were reported in horticulture production, animal science, and business administration. In this later group, an average of 36 percent of the graduates responded they did not use the skills or knowledge in their first job.

TABLE V-26. STUDY PROGRAM EVALUATION BY EAP GRADUATES IN RELATION TO FIRST JOB

	Satisfaction a/					Theory b/			
	0	1	2	3	4	0	1	2	3
Soils	72	13	69	184	36	74	100	178	22
Ag Production	72	7	36	165	94	84	23	224	43
Hort. Production	145	6	31	113	78	115	11	202	46
Animal Science	128	4	23	114	105	110	20	222	22
Ag Machinery	96	56	100	93	28	105	144	97	28
Ag Economics	94	31	70	119	60	101	120	136	17
Bus. Admin.	131	50	66	81	45	151	97	110	15
Communic. & Human Relations	65	83	65	96	64	148	80	114	31

a/ Satisfaction: 0 = Not Used
 1 = Very Unsatisfactory
 2 = Unsatisfactory
 3 = Satisfactory
 4 = Very Satisfactory

b/ Theory: 0 = Not Used or No Response
 1 = Too Much Theory, Too Little Practice
 2 = Right Mix
 3 = Too Little Theory, Too Much Practice

9/8230A

Among graduates reporting that skills or knowledge had been used, there was a high degree of satisfaction with the training received in soils, agricultural crop production, horticultural production, and animal science. From 72 to 89 percent of the graduates rated their training satisfactory or very satisfactory.

The other four areas, agricultural machinery, agricultural economics, business administration, and communications/human relations, show an almost equal division between satisfied and dissatisfied responses with satisfied slightly outweighing dissatisfied. Among this group, the agricultural machinery component drew the most dissatisfied responses. Agricultural economics drew more satisfied responses, but 36 percent of the

graduates still report dissatisfaction with the component. The other two components were about evenly split between satisfied and dissatisfied responses.

The question on the appropriateness of the mix between theory and practice drew an interesting response. The vast majority of graduates reported about the right mix between theory and practice for the agricultural crop production, horticulture production, and animal science. Of the remaining graduates who were dissatisfied with the mix in the same components, most thought there was too much practice and too little theory.

For the remaining five components, graduates were not as satisfied with the theory-practice mix. Approximately half thought the theory-practice mix was about right. Most of the remaining half indicated too much theory and too little practice.

When asked about the satisfaction of their training in relationship to their current job, (Table V-27) in all areas except one, more respondents indicated the area of study was not used than when responding about their first job. The human relations/communications competencies were used by graduates more than any of the other areas. Only 88 of the 374 respondents claimed not to use the human relation competencies in their current job.

Use of all competency areas declined from first job to current job except in business administration with only slight declines in agricultural economics and communications/human relations. The most noticeable decline was in the use of agricultural mechanics competencies, with about 50 percent more of the graduates claiming the skill was not used in the current job as compared to the first job.

TABLE V-27. STUDY PROGRAM EVALUATION BY EAP GRADUATES IN RELATION TO CURRENT JOB

	Satisfaction a/					Theory b/			
	0	1	2	3	4	0	1	2	3
Soils	117	14	53	158	31	114	80	158	21
Ag Production	107	7	32	146	81	112	24	194	42
Hort. Production	179	5	31	105	53	147	11	171	44
Animal Science	161	4	19	97	92	138	21	196	18
Ag Machinery	145	51	76	72	29	142	120	90	20
Ag Economics	107	27	69	108	62	119	105	135	14
Business Admin.	131	45	67	85	44	158	85	116	14
Communic. & Human Relations	88	71	62	88	64	163	74	108	28

a/ Satisfaction: 0 = Not Used
 1 = Very Unsatisfactory
 2 = Unsatisfactory
 3 = Satisfactory
 4 = Very Satisfactory

b/ Theory: 0 = Not Used or No response
 1 = Too Much Theory, Too Little Practice
 2 = Right Mix
 3 = Too Little Theory, Too Much Practice

10/8230A

For those who used the skill, the level of satisfaction was not appreciably different than reported for the first job held. Satisfaction in the technical production areas (soils, agricultural crop production, horticulture production, and animal science) was very high while the other areas drew a much higher proportion of "dissatisfied" responses. For the latter four areas, "satisfactory" responses held only a slight edge over "unsatisfactory" responses.

When queried about the mix between theory and practice, the majority response in relationship to present job was very supportive of the mix between theory and practice for soils, agricultural crop production, horticulture production, and animal

science. Graduates were less complimentary of the theory-practice mix in the other four areas. In these four areas there was still an expression of too much theory and too little practice.

What may be important to note is that the number reporting too little theory and too much practice remained relatively constant from first job to current job, even though the number reporting that they used the area of study in their current job is significantly less than those using the area in their first job.

From this simple response to the theory-practice question, it would appear that the soils, agricultural machinery, agricultural economics, business administration, and communications/human relations area should be examined to determine if adjustments can be made in the theory-practice mix.

2. Evaluation of Science Study Program

Graduates were asked to rate the science program they had at EAP in a general way using a scale ranging from below average (1) to excellent (5). Twelve of 374 did not respond to this question. Of those who did respond, most of the ratings were good to very good. A much higher proportion of those graduating in 1977 or after reported the instruction as "very good" or "excellent" compared to those who graduated prior to 1977. Graduates of 1977 or later rated the science program as "very good" to "excellent" in 61 percent of the cases, while earlier graduates rated it at these levels in only 42 percent of the cases.

The ratings according to the year of graduation are shown in Table V-28.

TABLE V-28. RATINGS OF SCIENCE PROGRAM BY EAP GRADUATES

	None	Below Average	Average	Good	Very Good	Excellent	Total
1983	0	0	3	8	23	5	40 <u>a/</u>
1982	0	1	2	6	12	5	26
1981	1	0	1	9	20	2	33
1980	0	1	0	10	13	3	27
1979	1	2	1	9	10	2	25
1978	2	3	2	6	12	3	28
1977	0	3	1	9	14	4	31
1976	0	1	1	5	7	0	14
1968-75	2	4	4	20	22	4	56
Prior to 1968	6	12	8	32	30	6	94
TOTAL	12	27	23	114	163	34	374

a/ One record did not fall in 1-5 coding scheme.
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D. Opinions On Needed Changes At EAP

Personal interviews were conducted with 242 Zamorano graduates to determine their opinions on alternatives to academic and practical training currently provided at Zamorano. Graduates were asked for their first and second choice opinions of five scenarios. Nearly eighty percent of those responding selected the scenario that the same enrollment should be maintained in a three-year program, and course work should be established requiring more time leading to a university degree for those students with high scholarship achievement. However, eighteen graduates qualified their choice by indicating the program should be available to all Zamorano Agronomos, and twenty-three suggested using the fourth year for specialization.

Maintaining the current program and adding training in research leading to a university degree for students with high scholastic achievement was most frequently selected as a second choice. Responses from graduates are reported in Table V-29.

A majority of the graduates felt that their first selection for alternative programs would contribute to their ability to get a job, receive promotions, to pursue higher education and permit EAP to better meet the employment needs of Latin America.

TABLE V-29. EAP GRADUATE CHOICES IN ALTERNATIVES FOR ACADEMIC AND PRACTICAL PROGRAMS AT ZAMORANO

	First Choice	Second Choice
A. Maintain the program as it is now being conducted with minor curriculum changes to current and future agricultural industry needs.	20	32
B. Expand the enrollment to about 1,000 students and maintain the same instructional program model.	2	5
C. Maintain the same enrollment and same three-year program and establish course work requiring more time leading to a university degree for those students with high scholarship achievement.	176	45
D. Maintain the program as it is, in addition, expand training in research requiring more time leading to a university degree for those students with high scholastic achievement.	13	77
E. With the same or reduced time in school, encourage students to specialize, therefore allowing opportunity for more graduates with existing facilities and budget.	11	68
F. Other suggestions. <u>a/</u>	<u>41</u>	<u>21</u>
Total	263	248

a/ Primarily special comments with respect to item C. See text.
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A majority of the graduates felt that the ability of EAP to maintain strong discipline and to develop good work habits and values would not change as a result of implementing alternative programs (Tables V-30-31).

TABLE V-30. EAP GRADUATE OPINIONS OF HOW 24 FIRST CHOICE ALTERNATIVE PROGRAMS WOULD ALTER THE EFFECTIVENESS OF ZAMORANO

	Alternative Programs Cited in Table V-29					
	A	B	C	D	E	F
Ability to get a job						
Improve	14	0	167	12	8	38
Reduce	0	1	0	0	0	0
Nochange	6	1	8	1	2	3
Ability to pursue higher education						
Improve	13	0	161	13	11	33
Reduce	0	0	2	0	0	2
No change	7	2	13	1	0	6
Ability of EAP to maintain the strong discipline development program						
Improve	5	0	42	2	7	12
Reduce	0	0	16	1	0	2
No change	15	2	116	6	5	27
Ability of graduates to develop and be promoted in their organizations or professions						
Improve	16	0	172	13	11	39
Reduce	0	1	0	0	0	0
No change	4	1	3	0	0	2
Ability of EAP to meet the employ- ment needs of Latin America						
Improve	16	1	151	13	11	33
Reduce	0	1	3	0	0	0
No change	3	0	24	1	0	7
Ability of EAP to develop good work habits and values in their students						
Improve	9	0	72	11	5	17
Reduce	0	0	4	0	0	1
No change	9	2	95	7	5	23

TABLE V-31. EAP GRADUATE OPINIONS OF HOW SECOND CHOICE ALTERNATIVE PROGRAMS WOULD ALTER THE EFFECTIVENESS OF ZAMORANO

	Alternative Programs Cited in Table V-29					
	A	B	C	D	E	F
Ability to get a job						
Improve	14	1	36	55	51	19
Reduce	2	1	2	1	6	0
No change	16	3	5	18	12	1
Ability to pursue higher education						
Improve	20	2	38	61	56	17
Reduce	0	1	0	1	3	0
No change	13	2	4	9	10	3
Ability of EAP to maintain the strong discipline development program						
Improve	9	0	12	21	18	12
Reduce	1	2	1	3	0	2
No change	22	3	31	50	48	5
Ability of graduates to develop and be promoted in their organizations or professions						
Improve	26	1	39	71	62	19
Reduce	1	0	0	1	0	0
No change	5	4	3	3	6	0
Ability of EAP to meet the employment needs of Latin America						
Improve	23	4	32	64	47	19
Reduce	0	1	3	2	3	1
No change	9	0	9	10	16	0
Ability of EAP to develop good work habits and values in their students						
Improve	12	1	11	39	28	15
Reduce	3	2	0	1	0	0
No change	16	2	32	35	41	5

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VI. EMPLOYERS' RESPONSE

A. Survey of Zamorano Employers

The purposes in interviewing employers of Zamorano graduates were:

- o To determine the present and anticipated manpower needs of the businesses and agencies, their plans for business expansion, and the preferred training level of employees.
- o To find the employers' perception of the level of competence of the Zamorano employee and to determine how well that level of competence matched the needs of the employer.
- o To determine the personal attributes the employers thought to be important and possessed by Zamorano graduates.

This information can be a valuable resource to the school in considering its future direction and/or modifications in curriculum.

1. Size and Kind of Employers

The employer sizes within the seven segments of the agricultural sector are shown in Table VI-1 by size category. Each reporting business employed at least one graduate of EAP. For ease of interpretation, the employer size is used to divide the employers into small (20 or fewer employees), mid-sized (21-400 employees), and large employers (over 400 employees).

The total recorded for each column shows the total number of employers in the agricultural segment while the average number shows the average number of employees in each business category.

There are marked differences among the types of business in business size. Agricultural production businesses are about equally represented in all sizes within the mid-sized class. There are a proportionately higher number of large businesses in the agricultural production segment. Of the 17 businesses with more than 400 employees, 10 are engaged primarily in agricultural production. On the other hand, almost all (9 of 11) of the agricultural processing firms are in the mid-size class.

The categories of marketing and distribution, finance, education, and government showed half or more of the business/agencies to be small with 20 or fewer employees. There were no large businesses or agencies reported in the finance and education categories.

These differences in business structure are further defined by the average number of employees. Finance and education agencies are the smallest, with government agencies, agricultural supplies and service, and marketing and distribution about twice as large. Both production and processing firms are large by comparison, with a few giant companies employing large numbers of workers.

The comparison of full-time to part-time employees is shown on Tables VI-2 and VI-3. Almost all of the part-time employment is found in the agricultural production and agricultural processing businesses with a significant but lesser amount in the large marketing/distribution firm. Businesses engaged in agricultural supply and service, finance and government agencies do not employ any significant amount of part-time labor.

TABLE VI-1. NUMBER OF EMPLOYERS REPORTING BY SIZE AND SEGMENT OF THE AGRICULTURE INDUSTRY: EMPLOYERS OF EAP GRADUATES

Number of Total Employees	Number of Employers Reporting															
	Total Employers		Ag. Prod.		Ag. Proc.		Mktg. & Dist.		Ag. Sup. & Serv.		Finance		Education		Govt. Agency	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1-5	28		12		0		1		2		4		5		4	
6-10	28		9		0		4		1		4		1		9	
11-15	27		11		0		2		2		3		3		6	
16-20	<u>22</u>		<u>6</u>		<u>1</u>		<u>5</u>		<u>1</u>		<u>1</u>		<u>3</u>		<u>5</u>	
Total Percent		47.5		45.7		9.1		63.2		31.6		57.1		50.0		54.5
21-30	24		6		1		3		4		1		5		4	
31-40	18		5		1		1		3		3		3		2	
41-50	11		4		1		0		1		0		2		3	
51-100	18		5		2		1		3		4		1		2	
101-200	15		6		0		0		1		1		1		6	
201-400	<u>13</u>		<u>9</u>		<u>4</u>		<u>0</u>		<u>0</u>		<u>0</u>		<u>0</u>		<u>0</u>	
Total Percent		44.8		42.2		81.8		26.3		63.1		42.9		50.0		38.6
401-11,000	<u>17</u>		<u>10</u>		<u>1</u>		<u>2</u>		<u>1</u>		<u>0</u>		<u>0</u>		<u>3</u>	
Total Percent		7.7		12.1		9.1		10.5		5.3		0.0		0.0		6.8
TOTAL EMPLOYERS	221		83		11		19		19		21		24		44	
TOTAL PERCENT		100.0		100.0		100.0		100.0		100.0		100.0		100.0		100.0
AVERAGE NUMBER OF EMPLOYEES	236.9		451.3		687.6		84.9		71.7		34.4		29.1		72.3	

TABLE VI-2. FULL-TIME EMPLOYEES OF BUSINESSES AND AGENCIES EMPLOYING EAP GRADUATES

Number of Full-Time Employees	Total	Ag. Prod.	Ag. Proc.	Mktg. & Dist.	Ag. Sup. & Serv.	Finance	Education	Govt. Agency
1-5	37	21	0	1	2	4	5	4
6-10	28	7	0	4	1	4	3	9
11-15	29	10	0	2	2	4	5	6
16-20	19	6	1	5	1	0	1	5
21-30	23	6	1	3	4	2	3	4
31-40	17	5	1	1	3	2	3	2
41-50	11	4	1	0	1	0	2	3
51-100	20	6	2	2	3	4	1	2
101-200	15	6	0	0	1	1	1	6
201-400	10	6	4	0	0	0	0	0
401-11,000	12	6	1	1	1	0	0	3
TOTAL	221	45	11	19	19	21	24	44
AVERAGE NUMBER	157.3	307.5	227.5	53.3	71.6	34.3	26.7	72.1

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TABLE VI-3. PART-TIME EMPLOYEES OF BUSINESSES AND AGENCIES EMPLOYING EAP GRADUATES

Number of Part-Time Employees	Total	Ag. Prod.	Ag. Proc.	Mktg. & Dist.	Ag. Sup. & Serv.	Finance	Education	Govt. Agency
0	169	47	8	18	18	18	17	43
1-5	20	13	0	0	1	2	3	1
6-10	8	5	0	0	0	1	2	0
11-15	3	2	0	0	0	0	1	0
16-20	2	0	1	0	0	0	1	0
21-30	4	4	0	0	0	0	0	0
31-40	1	0	1	0	0	0	0	0
41-50	0	0	0	0	0	0	0	0
51-100	0	0	0	0	0	0	0	0
101-200	3	3	0	0	0	0	0	0
201-400	4	4	0	0	0	0	0	0
401-11,000	7	5	1	1	0	0	0	0
TOTAL	221	83	11	19	19	21	24	44
AVERAGE NUMBER	79.6	143.8	460.0	31.6	0.1	0.1	2.4	0.2

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2. Manpower Supply and Demand

Information was obtained from a number of employers on the current employment by training level and the projected demand for employees within the same training level categories. In addition, the employers were asked what their perception was of the projected supply of personnel to meet their hiring needs. Results are presented in Table VI-4.

Because not all employers responded to the questions about supply and demand estimates, the total number of employees does not agree with the total average number of employees in Table VI-1. However, for the group that did respond (generally small and medium sized businesses) the information is thought to be accurate.

TABLE VI-4. PROJECTED EMPLOYMENT: EMPLOYERS OF EAP GRADUATES

	Total Current Employees	Total Projected Employees 3-7 years	Percent Increase
Primary School	2,608	--	--
Secondary School	1,058	1,285	21.5
Two Year Post-Secondary	792	1,110	40.1
B.S. Equivalent Degree	529	844	59.5
Advanced Degree	90	178	97.7

Note: Respondents = 221
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Table VI-5 provides the aggregate summary of the current employment and the projected demand perceptions. Information for each of the segments of the agricultural sectors is included in Appendix B. It is significant that those who responded show some projected employment increase in the average number of personnel with two-year post-secondary training and with university degrees, but register only a slight increase in the average number of employees with only secondary education.

TABLE VI-5. CURRENT EMPLOYMENT, PROJECTED EMPLOYMENT, AND PERCEIVED SUPPLY BY ACADEMIC TRAINING LEVEL FOR EMPLOYERS IN ALL AGRICULTURAL BUSINESSES OR AGENCIES: EAP GRADUATE EMPLOYERS

	<u>Current Employees</u>		<u>Projected Employment b/</u>		<u>Number of Business: Perceived Supply</u>		
	<u>Average Number a/</u>	<u>Number Businesses Reporting</u>	<u>Average Number</u>	<u>Number Reporting</u>	<u>Inadequate</u>	<u>Adequate</u>	<u>Surplus</u>
Primary School Only	23.5	111	--	--	--	--	--
Secondary School	14.7	72	15.3	84	12	64	16
Two Year Post-Secondary	4.2	180	6.0	185	13	117	15
B.S. Equivalent Degree	4.4	123	5.9	143	8	96	21
Advanced Degree	1.1	82	1.8	99	11	71	8

a/ Average number is based on all businesses.

b/ The time frame for employer projections was three-seven years.

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However, in addition to the average number of employees per business, there was a significant increase in the number of businesses employing persons with some training beyond primary school. In all categories of training levels, there were increased numbers of businesses projecting increases. Those increases are most easily identified in Table VI-4, projected employment.

The largest percentage increase in projected personnel is for persons with advanced degrees. They are projected to increase by 97.7 percent over the current level. However, this increase represents only 88 additional workers. The largest numerical increases in projected personnel are for two-year post-secondary graduates and for B.S. degree graduates, with projections of 318 and 315 additional employees, respectively.

These projections are significant because they illustrate employers' perceptions that the preparation and training level of the work force will increase. Employers foresee a significantly higher demand for personnel with B.S. equivalent degrees and advanced degrees than for those with lesser levels of training.

On the question of supply, the response is mixed. The vast majority of employees perceive the future supply to be adequate at all levels of training, but there are some subtle differences in their responses to shortage/surplus. For secondary students the employers predicting either a shortage or a surplus are about evenly divided (12 versus 16). For two-year post-secondary graduates, the prediction is about the same (13 versus 15). For B.S. equivalent degree graduates, however, 21 predict a surplus while only 8 predict a shortage. For the more advanced levels (M.S. or Ph.D.) the prediction for shortage exceeds the prediction for surplus (11 versus 8). Advanced degree personnel is the only category where employers perceive there will be a shortage of personnel.

3. Personal Attributes of EAP Graduates

Employers were asked to rate EAP graduates on nine personal attributes thought to be important to satisfactoriness of the employee. They were asked to rate them in relationship to other employees they had encountered. The employers' aggregate responses to the nine attributes are shown in Table VI-6. Employer responses by industry segment are shown in Appendix C.

In general, EAP graduates ranked high on the nine attributes, with an average of less than 3 percent of the responses of employers in the "below average" category. The largest number of below average responses was to the statement "Employee's willingness to work together in cooperative effort." (12 of 186 responses). However, 98 of the 186 respondents ranked the EAP graduate as being above average in this attribute.

Not all employers of EAP graduates responded to this series of questions about personal attributes. Even if all who failed to respond would have judged EAP graduates to be below average in all attributes, the results would still have been heavily weighted with a very positive response to the personal attributes of the EAP graduate.

TABLE VI-6. EMPLOYER RATING OF PERSONAL ATTRIBUTES OF EAP GRADUATES COMPARED TO OTHER EMPLOYEES IN BUSINESSES OR AGENCIES EMPLOYING EAP GRADUATES

Attribute	No. of Employers Rating EAP Graduates As:			
	Above Average	Average	Below Average	No Response
Loyalty to employer and business or agency	87	96	3	0
Positive attitude toward work of all kinds at all levels	107	74	5	0
Honesty in dealing with others	101	83	1	1
Promptness and dependability in coming to work	115	64	7	0
Self-confidence in employee's own ability	109	74	3	0
Employee's acceptance of terms, conditions, and environment of the work place	96	81	9	0
Employee's acceptance of responsibilities	114	69	3	0
Employee's willingness to work together in cooperative effort	98	76	12	0
Ability to establish and achieve goals	97	82	6	1
Average no. of businesses reporting	102.6	77.7	5.4	xx

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4. Importance of Personal Attributes

Each employer was asked how important certain personal attributes were in his/her decision to hire, retain and promote an employee. Each factor was ranked from 1 to 10 with 1 being least important and 10 being most important. The responses of the 222 businesses interviewed are shown in Table VI-7. A few employers who did not respond are shown as category 0, no response. To aid in interpretation, the percentage of employers who chose category 8, 9 or 10 (high levels of importance) are shown in the last column.

Three skill/knowledge attributes were intermingled with personal attributes. This was done to obtain a measure of relative importance between skills and personal attributes and among three important skill categories.

The results of this portion of the survey are not surprising. The three skill attributes ranked measurably below the personal attributes in importance. Communications skills ranked above technical agricultural skills and general business knowledge.

Ranked at the top of the scale are honesty, acceptance of responsibility, cooperation, punctuality and dependability, and attitude toward work, in that order. In general, these are the same qualities that employers have used to describe the satisfactoriness of employees in numerous other studies. These qualities are shown also in Table VI-6 where employers ranked EAP graduates in relationship to others. In all categories, the majority of EAP graduates ranked above average.

TABLE VI-7. EMPLOYER ASSESSMENT OF THE IMPORTANCE OF EMPLOYEE PERSONAL ATTRIBUTES: BUSINESSES OR AGENCIES EMPLOYING EAP GRADUATES

Attribute	Number of Businesses Reporting											Percent Respondents Ranking This Attribute 8, 9 or 10
	No Response 0	Least Important 1	2	3	4	5	6	7	8	9	Most Important 10	
Communication Skills	1	0	1	1	1	10	6	25	77	27	73	80.0
Loyalty	2	0	0	1	0	6	4	12	28	34	133	88.6
Attitude Toward Work	1	0	0	0	0	3	2	10	40	53	113	93.2
Honesty	1	0	0	0	0	1	2	1	10	33	174	98.2
Punctuality & Depend.	1	0	0	0	1	1	5	5	40	53	116	94.5
Self-confidence	2	0	0	0	0	6	7	13	46	58	90	88.2
General Business Sense & Knowledge	1	1	2	0	0	7	18	22	64	44	63	77.4
Satisfaction with Job	1	0	0	0	0	2	4	12	51	61	90	91.4
Acceptance of Respons.	1	0	0	0	0	0	0	5	31	55	130	97.7
Cooperation	2	0	0	0	0	0	4	5	36	55	120	95.9
Establish & Achieve Goals	1	0	0	0	1	0	4	12	61	64	78	91.9
Technical Agriculture Knowledge	3	4	1	0	3	12	7	25	66	28	73	76.3

5. Reasons for Hiring EAP Graduates

Employers were asked in an open ended question why they elected to hire an EAP graduate in preference to a graduate from some other institution. Their responses were carefully read and categorized.

Twenty either did not answer the question or indicated they did not do the hiring. The responses of all others are categorized below.

<u>Technical Training</u>	<u>Number Responding</u>
Good academic training	39
Excellent in technical areas	26
Excellent in production areas	12
<u>Experience Background</u>	
Extensive experiences	19
Possessed the skills needed	17
They are practical	10
Ability to manage field workers	2
Experienced in agricultural projects	1
Has had more practical experience	1
<u>Personal Attributes</u>	
Good attitude, very responsible, possesses initiative, capable, adapts well	30
Hard workers	7
High integrity	2
<u>Reputation</u>	
School has good reputation	17
Knew the graduate or his family	5
Zamoranos have good reputation	3
Excellent in education	1
<u>Other/General</u>	
Did well in job interview/test	7
Fits job requirements	5
Better performance	4
Had a post-graduate degree	4
Ingeniero agronomo not available	1

In summary, EAP graduates were hired in preference to others because employers were impressed with EAP graduates' academic and technical training, their practical experience, and their non-academic attributes that are a mark of satisfactory employees. The reputation of the school or other EAP graduates they had known were also frequently cited.

B. Survey of Employers Not Hiring Zamoranos

The study also included a sample of 447 employers who were not known to have hired an EAP graduate. Each time an employer of an EAP graduate was selected, two additional businesses or agencies not known to be employers of EAP graduates were also selected using the process described in the section on methodology. These businesses were selected using a random process that sampled more heavily from the types of businesses in which EAP graduates were not employed. Thus the combination of employers of Zamorano graduates and other employers should provide a reasonably accurate picture of employment trends and perceptions of supply among the total spectrum of agriculturally related businesses in the countries sampled.

1. Size and Kind of Business

Using the same divisions of business size as reported for employers of EAP graduates (20 or fewer employees small, 21-400 employees mid-sized, over 400 employees large), over half of the businesses interviewed would be classified as small. Only 5.6 percent of the businesses would be classified as large. The businesses according to size and divided by segment of the agricultural sector are reported in Table VI-8. The distribution by number of employees and business segment is also reported in Table VI-9 (full-time employees) and Table VI-10 (part-time employees).

TABLE VI-8. NUMBER OF EMPLOYERS BY SIZE AND PRIMARY BUSINESS ACTIVITY: A SAMPLE OF 447 EMPLOYERS NOT KNOWN TO EMPLOY EAP GRADUATES

	Total	Ag. Prod.	Ag. Proc.	Mktg. & Dist.	Ag. Sup. & Serv.	Finance	Education	Govt. Agency
1-5	77	3	3	21	35	12	2	1
6-10	76	9	9	17	16	10	7	8
11-15	45	4	5	15	7	6	4	4
16-20	32	1	9	8	5	1	4	4
21-30	53	6	7	14	6	6	9	5
31-40	26	4	4	6	5	1	2	4
41-50	11	0	5	1	0	3	2	0
51-100	45	8	9	8	5	4	4	7
101-200	37	5	11	7	4	2	3	5
201-400	20	5	2	1	1	3	2	6
401-4,800	25	5	5	2	4	2	3	4
TOTAL	447	50	69	100	88	50	46	48
AVERAGE NUMBER	120.8	199.1	209.3	50.3	29.5	74.1	229.9	173.1

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TABLE VI-9. NUMBER OF FULL-TIME EMPLOYEES BY SIZE OF EMPLOYER AND PRIMARY BUSINESS ACTIVITY: A SAMPLE OF 447 EMPLOYERS NOT KNOWN TO EMPLOY EAP GRADUATES

	Total	Ag. Prod.	Ag. Proc.	Mktg. & Dist.	Ag. Sup. & Serv.	Finance	Education	Govt. Agency
0	2	0	0	0	1	0	1	0
1-5	89	4	6	24	39	12	3	1
6-10	80	10	11	16	14	10	10	9
11-15	43	4	2	16	8	6	2	5
16-20	33	2	9	10	3	1	5	3
21-30	45	6	6	11	5	6	7	4
31-40	22	3	5	4	4	1	1	4
41-50	14	2	5	2	0	3	1	1
51-100	45	8	9	9	5	4	4	6
101-200	39	6	10	5	4	2	4	8
201-400	14	3	2	1	1	3	1	3
401-4,800	18	2	4	2	1	2	3	4
TOTAL								
AVERAGE NUMBER	104.3	101.6	198.7	47.1	28.5	73.9	201.3	171.0

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TABLE VI-10. NUMBER OF PART-TIME EMPLOYEES BY SIZE OF EMPLOYER AND PRIMARY BUSINESS ACTIVITY: A SAMPLE OF 447 BUSINESSES NOT KNOWN TO EMPLOY EAP GRADUATES

	Total	Ag. Prod.	Ag. Proc.	Mktg. & Dist.	Ag. Sup. & Serv.	Finance	Education	Govt. Agency
0	343	28	51	78	68	48	31	39
1-5	52	10	7	13	14	1	3	4
6-10	18	3	5	2	2	1	3	2
11-15	5	1	1	1	0	0	1	1
16-20	5	0	2	2	0	0	0	1
21-30	3	0	0	2	0	0	1	0
31-40	4	1	0	1	1	0	1	0
41-50	3	1	1	0	0	0	0	1
51-100	2	0	1	0	0	0	1	0
101-200	3	2	0	1	0	0	0	0
201-400	0	0	0	0	0	0	0	0
401-2,500	6	4	1	0	0	0	1	0
TOTAL								
AVERAGE NUMBER	16.5	97.5	10.6	3.2	1.0	0.2	28.6	2.1

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To summarize, in those businesses not known to employ EAP graduates, 86.3 percent of the work force are full-time employees, with 76.7 percent of the employers reporting that they do not employ any part-time workers.

To better portray the total employment picture, and to gain insights as to the differences in structure between businesses that employ EAP graduates and those not known to employ EAP graduates, information from the two groups interviewed is combined in Appendix D.

2. Manpower Supply and Demand

The sample of 444 employers who were not known to employ EAP graduates were asked about their perceptions of supply and demand for persons with various levels of training. Not all responded with data that could be readily interpreted, but about 60 percent provided responses to current and future employment by category of training and recorded their perceptions of the future supply. Their responses are shown in Table VI-11 for all businesses combined. Individual tables for the response of each segment of the agricultural sector are shown in Appendix E.

Employers predicted a growth in the average number of employees in their business in every category of training. In absolute numbers the growth was highest for post-secondary graduates (1.7 employees per business) and lowest for advanced degree graduates (0.5 per business). But while these increases on a per-business basis were not large, it is significant that more businesses were anticipating employing graduates with agricultural training than was currently the case.

The growth in employment can best be illustrated by examining the current total employment in each category in relation to the anticipated employment. That information is shown in Table VI-12.

TABLE VI-11. CURRENT EMPLOYMENT, PROJECTED EMPLOYMENT AND PERCEIVED SUPPLY BY ACADEMIC TRAINING LEVEL FOR EMPLOYEES IN TOTAL BUSINESSES OR AGENCIES NOT EMPLOYING EAP GRADUATES

	<u>Current Employees</u>		<u>Projected Employment</u>		<u>Number of Businesses Perceived Supply</u>		
	Average Number <u>a/</u>	Number Businesses	Average Number	Number Reporting	Inadequate	Adequate	Surplus
Primary School	27.8	211	X	X	X	XX	XX
Secondary School	3.6	144	4.8	167	4	136	36
Two Year Post-Secondary	2.7	168	4.4	260	26	221	15
B.S. Equivalent Degree	3.9	241	5.1	289	17	222	35
Advanced Degree	0.8	103	1.3	148	35	151	5

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TABLE VI-12. CURRENT AND PROJECTED EMPLOYMENT OF PERSONNEL WITH TRAINING IN AGRICULTURE: BUSINESSES NOT EMPLOYING EAP GRADUATES

	Total Current Employment	Total Projected Employment	Percent Increase
Secondary School	518	802	54.8
Two Year Post-Secondary	453	1,144	152.0
B.S. Equivalent Degree	940	1,474	56.8
Advanced Degree	82	192	134.0

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Employers anticipate that the demand for two-year post-secondary graduates and advanced degree graduates will more than double in the five-year period ahead, while demand for secondary and B.S. equivalent degree graduates will increase at a much slower pace.

It is interesting to compare the responses of employers who employ EAP graduates with those who do not. Table VI-13 combines the data from the two groups.

There are some sharp contrasts in employment projections, the most noted contrast in the projections for the two-year post-secondary group. Those who do not employ EAP graduates project a major increase in demand (152 percent), while those who employ EAP graduates project a modest increase (40.1 percent). The EAP graduate employers also project a small increase in secondary level graduates (21.5 percent), while other employers project the demand increase at 54.8 percent. The two groups' projections for B.S. level and advanced degree graduates are about equal. Both groups project a strong increase in the proportions of advanced degree graduates their businesses employ, although in absolute terms the numbers are relatively small.

An interesting question to ponder is how will the structure of the labor forces change if the projections for employment were to take place. Table VI-14 illustrates the current and projected structure by examining the percentage of the trained labor force that would be comprised by each category of training.

When both response groups are combined, their responses show no change in the percent of the labor force made up of B.S. equivalent degree graduates, a slight increase in advanced degree graduates, decreases in secondary level graduates, and approximately corresponding increases in two-year post-secondary graduates.

TABLE VI-13. CURRENT AND PROJECTED EMPLOYMENT: EMPLOYERS OF EAP GRADUATES AND NON-EAP GRADUATE EMPLOYERS

	EAP Graduate Employers			Non-EAP Graduate Employers		
	Current Employment	Projected Employment	Percent Increase	Current Employment	Projected Employment	Percent Increase
Secondary School	1,058	1,285	21.5	518	802	54.0
Two Year Post-Secondary	792	1,110	40.1	453	1,144	15.2
B.S. Equivalent Degree	529	844	59.5	940	1,474	56.8
Advanced Degree	90	178	97.7	82	192	13.4

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TABLE VI-14. CURRENT AND PROJECTED LABOR FORCE STRUCTURE: ALL BUSINESSES, EMPLOYERS OF EAP GRADUATES AND NON-EAP GRADUATES

	Current	Percent of Current	Projected	Percent of Projected
Secondary School	1,576	35.3	2,087	29.7
Two Year Post-Secondary	1,245	27.9	2,254	32.1
B.S. Equivalent Degree	1,469	32.9	2,318	33.0
Advanced Degree	172	3.9	370	5.2
	<hr/>	<hr/>	<hr/>	<hr/>
TOTAL	4,462		7,029	

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As a general rule, employers are optimistic when queried about future employment. Similar studies of manpower projections in the United States based on employer perceptions have shown this to be the case. But what may be important to note in this study is the shift in structure with a projected broadening of the employment base for two-year post-secondary graduates and a status quo projection for B.S. equivalent degree graduates.

The perceptions of supply of the non-EAP employers were shown in Table VI-11. Generally, respondents perceive the supply in all categories to be adequate, but for those who perceive it to be out of balance, more project a shortage than a surplus for two-year and advanced degree graduates, and more project a surplus than a shortage for secondary and B.S. equivalent degree graduates. Some differences in the perception of the adequacy of supply are evident between EAP graduate employers and non-EAP graduate employers, but the projections are not significantly contrary.

When both groups of employers are combined, employer perceptions about supply can be more easily examined. Table VI-15 presents these data.

There is no strong perception of supply/demand imbalance in any category, but secondary graduates and B.S. degree graduates appear to be slightly out of balance on the supply side, with some perception that the advanced degree graduate will be in short supply.

TABLE VI-15. NUMBER OF BUSINESSES REPORTING THE PERCEIVED FUTURE SUPPLY OF WORKERS TO BE INADEQUATE, ADEQUATE OR IN SURPLUS BY TRAINING LEVEL: ALL BUSINESSES EMPLOYING EAP GRADUATES AND NON-EAP GRADUATES

	Inadequate	Adequate	Surplus
Secondary School	16	200	52
Two Year Post-Secondary	39	338	30
B.S. Equivalent Degree	25	318	56
Advanced Degree	46	222	13

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3. Employers Not Employing EAP Graduates: Assessment of Desirable Attributes

The businesses who were not known to employ EAP graduates were asked to rank the desirable attributes of employees as they relate to their decision to retain or promote employees. They were given the same rating scale as used with employers of EAP graduates. Their responses to the twelve attributes are shown in Table VI-16. The percentage of responses in ratings 8, 9, and 10 have been combined in column A for ease in interpretation. Column B contains the responses obtained from employers of EAP graduates.

The most striking feature of these data is the close similarity between the responses of employers of EAP graduates and other employers. As with employers of EAP graduates, other employers rank the three skill areas--technical agriculture skills, communication skills, and general business knowledge--as the lowest attributes considered in judging the satisfactoriness of an employee. The personal attributes that can be reinforced by education but are rarely deliberately addressed in formal teaching are the attributes ranked highest by other employers.

The attribute ranked highest is loyalty. It ranks considerably higher for the other employers than for the employers of EAP graduates. Here it should be recognized that the other employers in general operate smaller businesses than those that employ EAP graduates. On the average, these other businesses employ only half as many employees. In small firms it is likely that there is an expectation of a higher degree of loyalty from a more limited number of employees.

On the other hand, employers of EAP graduates have slightly higher expectations in attributes that would accompany positions of responsibility such as administrators, supervisors, and research/teaching; previous tables show EAP graduates hold these positions in numbers disproportionate to the total work force.

4. Reasons for not Employing EAP Graduates as Reported by Employers not Known to Employ Zamoranos

The query to employers not known to employ EAP graduates about their reasons for not employing them brought a variety of interesting and varied responses.

Of the 432 employers surveyed, 16 had employed EAP graduates in the past. Another 19 did not do the hiring. Some simply did not recall any job openings (9) and others were new businesses just getting started (6).

TABLE VI-16. EMPLOYERS ASSESSMENT OF THE IMPORTANCE OF EMPLOYEE PERSONAL ATTRIBUTES IN ALL TYPES OF BUSINESSES OR AGENCIES: BUSINESSES NOT EMPLOYING EAP GRADUATES COMPARED TO BUSINESSES EMPLOYING EAP GRADUATES

Attribute	Number of Businesses Not Employing EAP Graduates Reporting											Responses of Businesses	
	Least Important						Most Important					Not Employing EAP Graduates Responses Rated 8, 9, or 10	Employing EAP Graduate Responses Rated 8, 9, or 10 <u>a/</u>
	0	1	2	3	4	5	6	7	8	9	10	-----percent-----	
Communication skills	3	1	0	2	2	17	29	42	112	58	178	78.4	80.0
Loyalty	3	0	0	3	2	4	7	6	28	63	328	94.6	88.6
Attitude toward work	5	0	1	0	0	5	8	15	72	93	245	92.3	93.2
Honesty	6	0	0	0	0	1	0	1	19	39	378	98.2	98.2
Punctuality and depen.	8	0	0	0	1	3	3	12	56	84	277	93.9	94.5
Self-confidence	6	0	0	0	1	4	15	20	90	87	221	89.6	88.2
Gnral. bus. sense and knowledge	6	1	1	1	3	22	28	42	120	85	135	76.6	77.4
Satisfaction with job	6	0	0	0	3	7	12	21	67	91	237	89.0	91.4
Acceptance of resp.	6	0	0	0	0	4	5	13	53	90	273	93.7	97.7
Cooperation	4	0	0	0	0	3	10	10	55	94	268	93.9	95.9
Establish and achieve goals	5	0	0	1	0	10	12	25	102	118	171	88.1	91.9
Technical agriculture knowledge	7	9	5	8	12	26	24	33	87	73	160	72.1	76.3

a/ From Table VI-7
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Other responses can be grouped in five categories to which the responses are closely related.

o	Lack of contact with or knowledge of Zamoranos	
	- none have applied	75
	- not enough available	10
	- never had the opportunity to meet/employ one	26
	- have never heard of the institution	<u>12</u>
	Total	123
o	Salary level expected by Zamoranos	
	- expect high salaries	38
	- business too small: can't afford to pay high salaries	<u>17</u>
	Total	55
o	Characteristics of Zamoranos	
	- prefer jobs in the city: don't want to work in rural areas	4
	- like to continue studying and won't stay in a job for long periods of time	<u>4</u>
	Total	8
o	Level of EAP training doesn't match needs	
	- prefer to hire someone with engineering degree or higher	14
	- do not require someone with those qualifications	44
	- not as qualified as Ingeniero Agronomo	1
	- are not specialized in marketing	5
	- not experienced in income & credit	3
	- will need a professional trained in business administration	2
	- need people with agri-mechanics experience	2
	- not enough experience in the required field	<u>18</u>
	Total	79

o	Would consider Zamoranos in the future	
	- would like to hire	13
	- will possibly need someone in the future	9
	- they are good professionals	<u>9</u>
	Total	31

Three (3) employers reported they had a pact with two different universities and only hired people from those institutions.

In summary, there were 3 general themes that were expressed by the employers as reasons for not hiring Zamoranos. The most common was lack of knowledge about the school and failure of graduates to apply for positions. The second frequently expressed theme was the mismatch of training with the employees needs while some pointed to specific technical deficiencies, more experienced a simple lack of experience in the required field. Some were looking for graduates with B.S. level or higher degrees. However the majority of the cases (44 of 79) said that the training Zamoranos received exceeded their needs. The salary level expected by EAP graduates was beyond the desire or ability of some businesses to pay.

One interesting note was the expression that Zamorano's liked to continue study and would not stay in a job long. The data related to EAP graduate attendance at universities and in seminars and workshops would indicate that this perception of desire for education was in fact true.

5. Job Profile and Future Employment

The first and current jobs of EAP graduates were compared with employment projections of employers and are presented in Table VI-17. The projected new jobs for B.S. equivalent degree and two-year post-secondary levels of training demonstrate a

pattern quite different from the EAP graduate employment profile. Agricultural production accounts for 30 percent of current jobs of EAP graduates but is projected to account for only about 8 percent of new jobs among the employers surveyed. Government dominates the job growth projections even though government agencies represented only 10 percent of the non-EAP employers interviewed.

TABLE VI-17. COMPARISON OF EAP GRADUATE EMPLOYMENT WITH PROJECTIONS OF NEW JOBS

	EAP Graduate Employment		Percent of New Jobs Forecast by Employers	
	First Job Percent	Current Job Number	Two Year Post-Secondary	B.S. Equivalent Degree
Ag. Production	36.6	29.6	7.9	7.8
Ag. Processing	2.9	17.3	21.4	8.0
Marketing & Dist.	2.1	2.4	7.3	9.7
Supplies & Services	7.2	14.7	8.9	4.0
Credit	8.3	8.5	9.3	16.8
Education	8.3	8.2	11.7	11.8
Government Agency	32.1	24.3	33.5	41.9
Non-Ag.	1.3	3.6	--	--
Student Unempl.	1.1	5.3	--	--
	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>

a/ Includes both EAP graduate employers and other employers. Support data and additional analysis are shown in Appendix E.

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If EAP decides to develop a degree program, the projection for new jobs in the "B.S. equivalent degree" class is of particular importance. Credit, government, education, and marketing are all areas that are more important in the future job market than in the EAP graduate employment profile.

Agricultural supplies and services and agricultural production are both categories of high importance in the EAP job profile compared to new positions. This may be due to a high level of small firm owner-operators in these fields.

VII. INTERVIEWER REPORTS

Interviewers of employers made observations while conducting interviews regarding employer personnel needs. Observations follow, summarized by country. The observations are subjective and may represent views or items of particular interest to the interviewer who was a recent graduate of EAP. Yet these comments provide information not available from the formal study process.

- A. Belize. The number of agricultural technicians is adequate, according to the businesses that were interviewed. Most business owners hold a degree in management or business administration. It is unusual for many businesses to give information freely.

- B. Costa Rica. Zamoranos find it difficult to obtain employment in government agencies. The major obstacle is not having a degree. The Association of Agricultural Engineers usually decides whether an individual is qualified to hold the position. Many employers are interested in the results of the study and would like to have a report of its findings.

Employers have very good opinions of the education provided by EAP, especially in the practical areas. Zamoranos adapt very well. They believe education could be improved in business administration. The political instability of the area makes it hard for them to predict future expansion.

Zamoranos are professionally respected in Costa Rica. The employers consider them as qualified as an Ingeniero Agronomo, especially in the areas of animal science, phytology, and practical agriculture. Zamoranos excel in sales, marketing, and farm administration. Employers feel that Zamoranos need to strengthen their competencies in business administration, agri-mechanics, and processing of agricultural products.

- C. Colombia. Zamoranos are at a disadvantage in competing for jobs with graduates of equal, and sometimes even inferior, academic training from other institutions. In spite of good references from employers, the graduates and the school are virtually unknown in Colombia.

Past graduates hold good jobs and are better established, because they had less competition compared to today's graduates. They estimate that today there are more than 4,000 unemployed Ingenieros Agronomos in Colombia. Even past graduates feel uncertain about their future employment and are starting their own businesses. An aggressive campaign to promote the EAP graduates is suggested.

- D. Dominican Republic. In the last decade, Zamoranos have been facing strong competition. The lack of a degree, not the quality of the graduate, seems to be the source of the problem. Employers viewed Zamoranos as equally and sometimes better qualified than others holding a B.S. degree from other institutions.

Recent graduates are dependent on past graduates for the recognition of their capabilities in the agricultural field. Other businesses employ Zamoranos in the marketing and sales of agricultural products.

- E. Ecuador. The employment situation for Zamoranos in Ecuador is better than those in Colombia, but it still can be improved. Past graduates feel that recent graduates are at a disadvantage, not because of their training, but because of the lack of a degree, especially when competing for jobs in the public sector. Zamorano employers are very satisfied with their employees' performances.

F. Guatemala. The majority of employers interviewed cooperated very well, and they were interested in the study. Most Zamoranos are employed in the private sector, where their qualifications are held in higher regard than in other areas. With few exceptions, employers were reluctant to predict future expansion due to the economic and political situation. They responded that they plan to retain the same number of employees, or cannot determine their future needs.

G. Honduras. Future projections for business expansion are hard to predict, due to the current economic and political situation. Over 90 percent of the employers interviewed were very interested in the study and contributed well.

Some employers said that EAP should put more emphasis on the teaching of tropical crops such as coffee, bananas, and sugar cane. More attention should also be given to soil conservation. Zamorano graduates, without a degree, are at a disadvantage compared to graduates from other institutions providing degrees. They are just as qualified or better qualified as a result of their training.

Conferring a degree will provide graduates with greater opportunities for better jobs and post-graduate studies. Employers are interested in hiring people with education in specialized fields.

H. Nicaragua. Employer interviews could not be conducted, as interview materials were confiscated by the Government of Nicaragua. The Minister of Agriculture and the Assistant Minister expressed that out of the total Nicaraguan enrollment of 30 students at EAP, only 5 graduates returned to Nicaragua in the last three years. They expressed that personnel at EAP influenced the students' decisions.

I. Panama. Employers, in' general, were very interested in the study and cooperated well. Political and economic crises in Panama make it hard for them realistically to predict future employment needs.

VIII. SURVEY OF MINISTRIES AND SELECTED INSTITUTIONS

The study team made visits to a number of schools producing graduates in agricultural sciences in Ecuador, Costa Rica, Honduras, Mexico, and the Dominican Republic. The selection of the countries and the schools visited was made by the research team with the input of Dr. Frank Bendana, EAP Board of Directors, and Chairman of the Manpower Study Committee.

No formal survey was performed utilizing a fixed questionnaire or some similar instrument. However, a set of guideline questions and strategies was developed for each institution. Actual interviews were informed yet purposeful and directed. A copy of the aforementioned guidelines can be found in Appendix F.

Visits to other educational institutions were enlightening and beneficial to the study, helping to complete a picture of what a broad range of institutions are doing in their educational programs for comparisons with EAP.

Individuals from the private sector were also informally interviewed for their reactions to EAP, its graduates, and manpower needs in agriculture in their regions. These are all individuals who are active in the agricultural sector and economy in their respective country. Information from these individuals is given later in this section.

A. Universidad Central del Ecuador

One of the institutions visited was the Facultad de Ciencias Agrícolas (analogous to College of Agriculture) of the Universidad Central del Ecuador located in Quito. Dr. Gerardo Naranjo M., Dean of Agricultural Sciences, was interviewed. The Facultad offers a program leading to the degree of Ingeniero Agronomo in four specialties: plant science, animal production, agricultural engineering, and rural development. The institution has several

farms, and its programs are designed to give students as much practical experience as possible, in order to achieve a balance between practice and theory. This is especially true during the first three program years before specialization.

There is a high rate of failure in coursework. Of some 300-315 newly inscribed students each year, currently some 40-45 will pass the first year, some of whom are repeats. In terms of numbers of professionals graduated each year, Dr. Naranjo believes there is a good balance. He did express, however, that the degree of Ingeniero Agronomo is not appreciated in the country. Perhaps the explanation lies in that most degree holders are hired by the public sector, with its traditional low pay and esteem. Another possible explanation is the tremendous number of agricultural programs in higher education in this small country--some 13 agricultural faculties in 17 universities nationwide. Few have programs of sufficient quality to merit praise, in Dr. Naranjo's estimation. Most are generalist, not specializing in specific subject matter areas.

There is no "colegio de ingenieros agronomos" in Ecuador; nevertheless there is professional jealousy between Agronomos and Ingenieros Agronomos. EAP graduates are subject to this, as they are considered by many as less than full "professionals" and by law must have their credentials subjected to "validation" in Ecuador. Zamoranos constitute a very small minority of professional-level agriculturalists in Ecuador and are, therefore, not seen as a threat in the work force.

B. Universidad de Guayaquil

An attempt was made to visit the agricultural faculty and programs of the Universidad de Guayaquil, located in the port city of Guayaquil, Ecuador. Contacts had been made for a visit to the University the morning of March 19, at which time the

University's students were on strike and the University was closed as a result. It was also impossible to keep the schedule which had been established. Several individuals were asked about the agricultural programs conducted at the University, but none of them was connected with the agricultural faculty or University.

The most notable comment of interest here is that preparation in any of the faculty's three area specialties (plant improvement, crops, and agricultural engineering) is too theoretical. Graduates are not prepared to assume positions with decision-making responsibility. When asked to compare a Zamorano graduate's training, the general response was that EAP excelled in the practical applications of agriculture and that it was perhaps in the theory itself that Zamoranos may need reinforcement. The EAP graduates' ability to perform was recognized and appreciated.

C. Universidad de Costa Rica

The Facultad de Agronomia of the University of Costa Rica (UCR), located in San Jose, was also selected as one of the institutions to be included in this phase of the manpower study. Its dean, a Zamorano graduate, and its programs are well known to the Experience, Incorporated field study team, which had performed program evaluations of the institution and its three schools awarding the degree of Ingeniero Agronomo. The agriculture faculty also offers a degree at the bachelor level, as do several other post-secondary institutions in Costa Rica.

The agriculture faculty of UCR enjoys a premier position among programs training agriculture professionals in the country. Its reputation is perceived as solid and respectable, and it extends beyond the Costa Rican borders. Academic training consists of a lot of coursework and little practical orientation, according to graduates at the Ingeniero Agronomo level. The three schools comprising the faculty's program are plant science, animal science, and agricultural economics.

Representatives of the University are well aware of EAP and its programs, and respect the preparation acquired by its students. Yet, Zamorano should not be seen as a competitor of UCR's programs. In Costa Rica, as is the case with Ecuador, Colombia, the Dominican Republic, and elsewhere, Zamorano graduates returning to these countries are relatively few in numbers and percentage of the work force. In Costa Rica, many agriculture graduates, even at the Ingeniero Agronomo level, are either not working or are not working in agriculture. There is an overabundance of professional-level personnel. Zamoranos cannot qualify for membership in the Colegio de Ingenieros Agronomos, the professional organization that protects positions for those who qualify for membership. This situation exists in other Latin American countries, as well.

D. Instituto Tecnológico y de Estudios Superiores de Monterrey

The Division de Ciencias Agropecuarias y Maritimas (Agricultural and Maritime Sciences) of what is known as the "Tecnológico" (ITESM) of Monterrey, Mexico had its beginnings in 1948 and has grown steadily since that time. As of 1984, over 2,500 agricultural professionals in six basic area specialities had received their degrees from ITESM at the level of Ingeniero Agronomo.

Dr. Juan D. Vega, Division Director, indicated an item of interest to the manpower study. He had recently attended meetings in Guadalajara among representatives of institutions of higher education in Mexico with agricultural programs of study. The goal was to discuss current and future trends in agriculture and in agricultural education. Of primary interest was the idea that less, not more, specialization is needed--that students with a general knowledge of agriculture will be in demand. Though discussions were centered on needs in Mexico, similar ideas from

Ecuador have also been presented in this report. Dr. Vega also identified agricultural management and administration as specific areas which will continue to be in high demand nationwide in future years.

Dr. Vega's comments about Zamoranos who attend the Tecnológico to continue their education were that they are well prepared--"de primera." They have notable practical experience. Zamorano graduates, however, make up a relatively low percentage of students in the Division of Agriculture. An additional note is that very few Mexicans leave Mexico for study at Zamorano. Consequently, few return and the overall impact of Zamorano's on Mexican agriculture is minimal. It is interesting to note that Mexico has some 70 post-secondary schools graduating nearly 6,000 ingenieros agronomos annually.

E. Instituto Superior de Agricultura

The Instituto Superior de Agricultura (ISA) is a post-secondary agriculture school attached to the Universidad Católica Madre y Maestra and is located in Santiago, Dominican Republic. Opportunity for insights into this school is provided by one of the Experience, Incorporated field study team members who recently moved to Santiago to reside in connection with full-time employment. His work there has afforded multiple opportunities to interact with ISA and observe its programs first-hand.

Experience with ISA during the past few months has shown that it has a growing program in agriculture and that it is recognized as a viable entity not only within the Dominican Republic but in the Caribbean Basin as well. It maintains programs at both the bachelor and ingeniero agronomo levels, and pursues an active program of seminars and specialized training in management, the latter funded heavily by USAID.

Conditions in the Dominican Republic are similar to those in other countries that are somewhat distant from EAP. A big factor is primarily that few individuals go to Zamorano to study. Thus, when they return they have little impact on manpower supply and demand in their country.

ISA is an institution that has some characteristics of Zamorano and others of the University of Costa Rica's agriculture faculty. If the latter institution were on one end of the spectrum, and Zamorano the other, ISA would be somewhere between. Most students live on campus, for example, but there is not the control and discipline found at Zamorano. The school is also surrounded by school-owned farmland, yet one does not observe the high production and student involvement in farming practices as are much in evidence at Zamorano. The UCR campus does not provide dormitories for agricultural students. The nearest farmland is miles away, requiring transportation by bus for any form of practical or hands-on experience.

F. Private Sector

Several of the more interesting and illuminating comments from individuals interviewed were spontaneous in the sense that other activities had been planned but had to be cancelled. Almost all of those whose ideas are presented are representatives of the private agricultural sector, some in agribusiness and others in crop production. A few are in public service in different capacities related to agriculture. They represent opinions from Ecuador, Mexico, Costa Rica, and the Dominican Republic.

One interesting observation concerns the three Ecuadoran EAP graduates from the last school year. After graduation in December, by mid-March two of them (one male and one female) had contracted full-time employment, both in the private sector. Each

was starting in respectable, professional, entry-level positions with good pay and benefits. The third was working virtually full-time for Experience, Incorporated performing interviews, even accepting a spontaneous request to interview in Colombia. He has good contacts in the country and did not express concern about finding a good position, thus he was willing to complete the manpower study. All three of these individuals had accepted the challenge of interviewing for Experience, Incorporated. It is important to note that in each case they demonstrated confidence, ability to perform, and the ability to make decisions under adverse conditions. In no instance did they move into a family-held business or position. These facts attest to their ability and the manner in which others perceive that ability.

It has certainly not gone unnoticed that the current Minister of Agriculture in Ecuador, Mr. Marcel Laniado, a Zamorano, has repeatedly expressed openly that Ecuadoran institutions ought to take a page from EAP's instructional system, giving increased emphasis to training and practical experience. It may be of interest to note that the publicity of Zamorano has been received with mixed reaction in the agricultural sector. A person being interviewed related that many interpret his comments as an affront to Ecuadoran education, while others feel this excessive zeal may demoralize and damage agriculture in the country. One must add, however, that to date none of these comments seems to have adversely affected any individual Zamorano.

Some interesting and revealing information was obtained in a joint interview with two section heads of a multidimensional agribusiness operating in Ecuador but owned by Continental Grains of New York. Both are well aware of the status of Ecuadoran agriculture. When addressing the question of future manpower needs in agriculture in the country, they each stated that Ecuador needs well-trained middle-level professionals of the type produced at Zamorano. Together they formulated the following list of areas they anticipated would most need such individuals:

- o Management of irrigation water;
- o Crop management, especially short-cycle crops;
- o Insect and disease control in crops;
- o Fertilizer development and use;
- o Management and correct use of farm/agricultural machinery; and
- o Farm administration/management.

Several of their observations are supported in a recent statement by the Minister of Agriculture in which he specifically mentions crop and seed production, irrigation, and crop management among current demands for improvements in the agricultural sector. He also emphasized marketing, an adequate pricing mechanism, and aggressive research as key points for agricultural stabilization and growth.

The individuals interviewed were well aware of Zamoranos and had good opinions of their preparation. They specifically mentioned that Zamoranos receive adequate practical training which leads to self-confidence. They further observed that banks seem to hire many Zamoranos, which they attributed to their professional understanding and knowledge.

G. Conclusions

The findings presented summarize information gathered from several institutions conducting post-secondary agriculture programs in the region of tropical America, the same region from which students attend EAP. The following conclusions resulted from visits to the institutions and interviews with their representatives, with additional information provided through interviews with other individuals working in agriculture in several countries.

Visits to the preceding institutions were designed to acquire basic information about programs and note the perceptions of interviewees with respect to EAP and its graduates and programs. At the conclusion of such visits, several common thoughts appear:

1. None of the institutions visited can or ought to be considered a rival of EAP, or vice-versa. Each institution operates within its own sphere of influence, and EAP has little impact on any of the others. The following two conclusions illustrate this point.
2. The interviews conducted indicate that in no case are EAP graduates viewed in negative fashion nor as a potential threat to the current programs of existing educational institutions. To the contrary, the preparation of Zamorano graduates is viewed as excellent, especially in its application to practicality.
3. In none of the areas visited were EAP graduates perceived as a threat to the employment of locally trained agricultural professionals, as there are relatively few graduates from EAP seeking employment in those countries visited. This is not out of the ordinary considering the high percentage of Zamorano graduates who are from Honduras itself, and the corresponding lower percentage who come from other countries in Tropical America.
4. Those contacted expressed positive comments about EAP graduates and their qualifications. Zamoranos are perceived as very capable individuals as a result of training oriented less toward agricultural theory and more toward practical applications.

5. Many of the observations and findings in visits and interviews focus on the question of academic degrees, recognizing that EAP currently awards only the title of agronomo. Although persons interviewed see the prejudicial effect of a Zamorano's credentials, often not qualifying him/her for work as an Ingeniero Agronomo, most expressed that this is not always disadvantageous. They believe that the future of real progress in agriculture in the region depends on the ability to train and utilize professionals of the type currently produced at EAP. However, they recognized that an elective Ingeniero Agronomo program at Zamorano could be advantageous in certain cases.

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IX. REVIEW OF LITERATURE

A. Introduction

The literature reviewed below pertains to agricultural programs at the post-secondary level in Latin America. More particularly, it focuses on the subject of professional manpower needs for agriculture/agribusiness in the future, and the impact of those needs on post-secondary educational programs. The literature review is further limited to the tropical areas of Latin America, the area from which students attend EAP.

Several sources of information have been researched. From the outset, an effort has been made to identify, locate, and acquire any existing pertinent publications or reports which deal with the subject of future agricultural/agribusiness manpower needs in Tropical America. The following were included in this search:

- o Agricultural manpower market studies for the region;
- o Other agricultural manpower market studies;
- o Studies performed by groups of institutions to review their role in filling the manpower requirements of the industry;
- o Macro-economic projections for agriculture and agribusiness in the region; and
- o Reports prepared by any ministries or other institutions.

This review reports the findings of the preceding effort and endeavors to reveal those findings of most significance to the subject of manpower needs in agriculture.

Curle (1970), in assessing the means for enhancing the human factor in the agricultural sectors of developing nations, indicates that education is the key ingredient. He specifically identifies the training of professional and subprofessional personnel for agriculture and recommends professional studies and scholarly inquiries into the training of agricultural specialists. Supporting these observations, a United States Presidential Commission recently performed an assessment of agricultural development and progress in the Caribbean and Central America regions of Latin America. Its report of findings places significant emphasis on the role of education in agricultural development (Presidential Commission, 1980). The report further recommends actions to "strengthen and expand national and regional institutions with potentials for offering strong education and training programs."

The following review will demonstrate that, in general, there is very little viable information or data available about agricultural programs in higher education in Latin America. Concerning future manpower needs for agriculture sectors, there is even less. One of the primary tasks of this study/project is to provide primary data of the type that is, at present, not readily available--data which can be of use in making decisions about the future course of agricultural programs. The very paucity of data or scholarly studies within the specter of preparation in agricultural careers at the post-secondary level verifies the urgent need for efforts of the type undertaken in this project.

B. Agriculture/Agribusiness Manpower Issues

The accumulation and/or review of literature was accomplished through various means. The following is a list of such subactivities:

- o Library searches at three United States universities;
- o Search of library holdings at EAP;
- o Search of library holdings at CATIE in Costa Rica;
- o Review of literature in personal libraries of some study team members;
- o Requests of manpower and related information from personnel contacted during the course of project work effort;
- o Computer search of books and articles held by the World Bank;
- o Computer and personal search of library holdings at the Instituto Superior de Agricultura (ISA) in Santiago, Dominican Republic;
- o Review of entries in databank on educational research in Latin America during past 12 years; and
- o Agriculture/agribusiness manpower studies of Latin America searches at the Library of the University of Minnesota.

In the course of the above subactivities, and in reviewing the materials and information obtained, several things became apparent. First, though several items appeared which addressed manpower in some fashion, there was virtually no current information or forecasts for the future with respect to agricultural professionals in particular. Most data were outdated enough to be of little value. No studies were found which directly addressed future professional manpower needs in agriculture for the region of tropical America. None specifically discussed expected future employment levels, either in terms of professional degrees (level of professional training) or specific training specialties (career specialties, competencies, etc.).

A limited number of publications were encountered which addressed manpower needs pertaining to specific nations or programs for certain countries. Of note among these was a thesis produced by Cussianovich (1980) entitled "Análisis Parcial del Mercado de Trabajo de los Profesionales y Técnicos del Sector Agropecuario en Costa Rica, 1977-1985." His analysis was designed to determine the extent to which the agricultural sector could sustain the growing numbers of agriculture professionals and technicians in the country as a result of the addition of several agriculture and forestry careers in public universities at the time. Cussianovich concluded that the agricultural workforce, at the time of his study, was saturated. Nevertheless, certain traits were shown to be desirable in the professional training of new personnel. Most predominant was a preference for those of good, sound technical formation, with a knowledge of economics as well. His research also showed that in many agricultural activities, especially those oriented to export-related activities, there was a growing preference for specialized professionals over those with general agriculture training. However, Cussianovich does not further specify what specialties would be most in demand. He also notes the tremendous influence government plays in the demand for agriculture personnel, as the public sector is by far the largest employer of agriculture professionals.

Anderson (1983) performed an evaluation of career programs of the University of Costa Rica's Facultad de Agronomia through personal interviews with recent graduates. His study revealed that 85.7 percent of those employed worked for the public sector. Private enterprise employed only 7.9 percent of those interviewed. Furthermore, he also discovered that the professional workforce in agriculture exceeded current demand, forcing many to work in non-agricultural positions, continue their education to additional career areas, or remain unemployed but looking for work. Anderson also reported on the general employment preparation needs of graduates. In order of importance, they were research, program/project execution, and personnel supervision. In general, additional preparation in the areas of management, administration, and supervision was shown to be highly recommended by interviewees.

A recent publication by Panama's Ministry of Agricultural Development directs some attention to professional personnel involved in technology transfer activities in agriculture. The publication indicates that, nationwide, some 136 individuals at the top three levels of Bachillerato, Agronomo, and Ingeniero Agronomo work in technology transfer. The top two claim 78 employees. What may be most revealing is that more than 64 percent of all employees work at the central office level. Among Ingenieros Agronomos, 31 percent are assigned to the central office, with the remainder working in the ten agriculture subregions of the country. These figures are at least consistent with other nations in area which have a tendency toward centralized programs. The limitations of the above referenced publication is that it addresses professionals in only one function performed by the Ministry of Agricultural Development and that no specific data on training requirements or future manpower needs are presented. The work does, however, indicate that public agencies together employ 77.6 percent of Ingenieros Agronomos (294 total) employed in agriculture. It further recognizes, as

other references have done, that the overall future of professional-level agriculture employment in Panama is heavily dependent on public policy and funding for agricultural programs. Interestingly, the agriculture ministry, since 1973, has received an increasingly smaller percentage of the national budget each year, to 2.2 percent in 1982. A subtle note at the conclusion of the section on personnel is that if an extension service were to be created and maintained in the country, it would require additional numbers of highly trained agriculture specialists. Again, this gives a clue that a demand for well-trained individuals exists, but it reveals no information or projections concerning specific specialty areas.

In addition to the publications referred to above, other reference materials have also been reviewed. For example, 118 holdings in the library of the Instituto Superior de Agricultura (ISA) in the Dominican Republic were examined. ISA's library is fairly well supplied. No publications containing information on manpower and agriculture were located.

A computer listing of references concerning education, manpower, and related issues located at the World Bank in Washington, D.C. was obtained. Brief summaries of the 20 entries listed indicates that most deal with general manpower issues and not with agriculture specifically. Additionally, it was felt that much of the data would be outdated and, therefore, not pertinent. None of the publications found in the printout, most of which were periodical articles, was sought out for specific review.

One additional search was made of publications and brief descriptions from a computer program compiled by Everett Egginton on 12 years of educational research in Latin America. The availability of the databank was reported by Egginton (1983). Of the various printouts from the databank, there were no listings which addressed manpower and education relationships in agricultural subjects. This is one more indicator of the lack of research on the subject.

C. General Literature On Post-secondary
Agricultural Career Programs

The review of literature yielded several publications dealing with post-secondary programs and careers in agricultural specialties, though not addressing manpower needs for agriculture directly. They are not individually reviewed here as they do not fall within the specific objectives of the study. Many more publications were reviewed than those detailed specifically in the preceding section. Within limits, the literature search activities were intense, numerous, and thorough.

With all that was found, little information on Latin American manpower needs in agriculture/agribusiness in the future exists. Glimpses or ideas from the literature that was encountered substantiate the need for the type of research conducted in this project. Nothing of its scope or depth has been attempted by any other agriculture institution, so far as the literature indicates. This study is therefore, unique in purpose and execution, and it yields one-of-a-kind type data.

A brief bibliography of some of the literature reviewed but not cited herein is attached for the interested reader. It may be of help in some future study or scholarly endeavor.

D. Macro Economic Influences

As referenced in the introduction to this report, one method of estimating future employment needs is to consider growth rates of the economy or economic sector. The projections available for review were largely prepared in the beginning of the decade. Examples for Latin America are presented in Table IX-1. If the forecast annual growth rates for gross domestic product (GDP), agricultural production, and agricultural product demand are compounded for five years, the increases are in the area of 35 percent, 16 percent, and 15 percent respectively at the conservative levels. These would surely suggest a fundamental growth in the demand for agriculturally trained manpower.

The projections likely have a good foundation as a long run point of view. However, recent economic performance demonstrates the limitations for applying these projections to any given time period (Table IX-2). While per capita income, a close approximation for per capita GDP, was projected to grow between 1 and 3 percent, seven of twelve countries show a decline in 1984.

TABLE IX-1. FORECASTS OF KEY ECONOMIC GROWTH STATISTICS

		Annual Percentage Growth
<hr/>		
A.	Population Growth	
	Global 2000 <u>a/</u>	
	1975-2000	
	Low	2.17
	Medium	2.61
	High	2.94
	FAO <u>b/</u>	
	1980-2000	2.6
B.	Per Capita Income	
	Global 2000 <u>a/</u>	
	1985-2000	
	Low	0.97
	Medium	1.84
	High	2.84
C.	Gross Domestic Product	
	FAO 1980-2000 <u>b/</u>	
	Scenario B	6.0
	Scenario A	7.1
D.	Agricultural Production	
	FAO 1980-2000 <u>b/</u>	
	Trend	3.0
	Scenario B	3.2
	Scenario A	3.8
E.	Total Agricultural Product Demand	
	FAO <u>b/</u>	
	Trend	2.9
	Scenario B	3.4
	Scenario A	3.7
<hr/>		

a/ The Global 2000 Report to the President by Council for Environmental Quality and Department of State, 1980.

b/ Agriculture Toward 2000, Agricultural Organization of the United Nations, Rome, 1981.

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TABLE IX-2. CHANGES IN REAL GDP, SELECTED COUNTRIES

Central America <u>a/</u>	1982	1983	1984	1985
Costa Rica	-6.9	2.3	3.0	--
El Salvador	-5.6	0.0	1.5	--
Guatemala	-3.5	-2.7	0.0	--
Honduras	-1.8	-0.5	2.0	--
Nicaragua	-1.2	4.6	0.6	--
Panama	5.2	0.4	0.0	--
Andean <u>b/</u>				
Venezuela	--	--	-1.7	1.0
Peru	--	--	2.1	3.0
Ecuador	--	--	3.0	2.0
Bolivia	--	--	-5.0	-3.0
Chile	--	--	6.0	5.0
Colombia	--	--	3.0	3.0

a/ International Monetary Fund, International Financial Statistics, 1984 Yearbook.

b/ Foreign Agricultural Service Annual Attache Reports and ERS/USDA Estimates.

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X. EAP EVALUATION

A. Overview

EAP is an institution with a tremendous amount of heritage and a solid reputation. It is one which has high standards of excellence and has a faculty which believes in the philosophy of learning by doing through quality teaching. Students come from 16 countries and pursue what would be equivalent to a four-year B.S. degree program in three years of continuous study. Upon first observation, it might be considered to be a conservative institution, yet it is not difficult to detect from faculty and administration that it is a forward moving institution striving diligently to develop and maintain a viable curriculum to meet the needs of students. In addition, the school has some of the most modern equipment and is striving to keep up, if not ahead, in this area. Examples include EAP's computer laboratory, the renovation of dairy, meat, and food processing plants, and the addition of a modern post-harvest marketing facility.

EAP has an attractive campus located in the valley just beyond the mountains from Tegucigalpa. There are two farms, with all types of farming conditions available for students; one farm is on mountainous terrain, and the other is level in the valley.

EAP's buildings are very adequate with nice dormitories for students, good classrooms for teaching, an adequate administration building, and a library which now needs expansion. Plans are being made to build a new building to include a student center, an auditorium, and administrative offices.

B. Student Body

Enrollment at EAP, which has grown steadily over the past years, is currently at 430 students from approximately 16 Latin American countries. There is a good representation of students from different countries and income levels, with both sexes included. The number of women has increased steadily, from 6 women in 1981 to 42 in 1984.

Students are considered for admission based upon their secondary school grades and their scores on an entrance examination. Of the last seven classes to be admitted, approximately 25 percent of those that applied were granted admission. Even more outstanding is the number who graduate from each class, an average of 59 percent per class over the past four years. These two pieces of data are an indication of the high standards for admission as well as the rigor of the academic program. During orientation new students are also given mathematics and English competency examinations for placement purposes.

Students live in dormitories and eat in a dining hall. They maintain a rigorous schedule from 5:00 a.m. until 9:00 p.m. when lights are out. During this long day, students must be involved with their field experience module for at least four hours per day for a six-day week, and attend six 50-minute class periods each day five days per week for their educational program. In addition, they are responsible for maintaining their living quarters and managing their study time effectively.

C. Faculty and Staff

Table X-1 provides data on the number and educational level of faculty for the year 1985.

TABLE X-1. EAP FACULTY AND STAFF EDUCATION LEVELS

	Level of Education			
	Ph.D.	M.S.	B.S.	Agronomo
Basic Science	1	5	4	--
Horticulture	2	1	1	6
Agronomy	7	3	1	5
<u>Special Projects</u>				
Agronomy	--	--	--	10
Integrated pest management				
Agronomy UPR	--	--	--	5
Animal Science	6	3	2	7
Development and Planning	--	--	2	--
Engineering and Mechanization	1	1	1	2
Production	--	--	--	5
Agribusiness and Economic	--	3	1	--
TOTAL	17	16	12	40

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It can be observed that approximately half of the academic staff are instructors. These persons are recent graduates of EAP and are hired for not more than two years to assist professors in their teaching program and management of the field experience modules. They are mature young persons who are gaining considerable experience from an instructional standpoint, which is another element in their education.

A large percentage of the faculty are graduates of EAP, yet, this is changing somewhat over recent years because it is recognized that faculty who were not graduates bring a different perspective to the program. It takes a special type of person to

serve on the faculty and work within this extremely rigorous environment. Faculty members must be dedicated to furthering the education of students or they would not remain in this type of situation. It appears there is a good mix between participatory management and direct management from administration. Faculty are very positive and are doing their work extremely well.

D. Facilities and Equipment

It was not the intent of the review team to make a detailed analysis of the facilities and equipment; however, observance was made as to how they were related to the academic program. A school such as EAP needs to have considerable equipment and adequate facilities to conduct such an extensive curriculum.

New and modern equipment is being added each year to existing facilities, and present equipment is in good repair and well managed. Laboratories are well equipped and being expanded each year. Farm tools and equipment are practical and of the type required to teach students modern practices. With the volume of production as well as the number of students who are to become competent in a large number and variety of skills and competencies during their educational program, considerable equipment is required.

The present facilities and equipment are adequate, and there is a priority program for adding to the campus each year which enables the program to grow and be conducted in a modern environment.

E. The Educational Program

Students at EAP have the opportunity to be engaged in a rigorous academic program that includes three dimensions: class work, laboratory experience, and a field learning experience program. Each component complements the other and they are co-

ordinated for effective instruction. The EAP program has been developed with a great amount of attention to detail and finite organization.

1. Scheduling

Classes are divided into two major sections for morning and afternoon scheduling, and sections are further divided to provide for large group, small group, and individualized instruction.

The first and second year students are divided in two groups for scheduling purposes. There are several important considerations made in the scheduling which center around the needs of students; one-half of the students in these two classes do their field experience in the morning while the other half has class work. Students alternate in the afternoon. The third year students are not divided into sections for two reasons: first, the third year class is not as large as the others; second, the subject matter is primarily animal science, and students must be involved both morning and evening to care for the livestock. This scheduling format provides the following advantages:

- o Efficiency for classroom, laboratory and equipment use;
- o Smaller classes with opportunity for more individualized attention to enhance learning by doing;
- o An even distribution of student labor to provide for crop handling and marketing;
- o Provision for students to assist in the care of livestock both morning and evening;

- o All students have the opportunity to be directly involved with every competency and/or skill that is being taught;
- o Instructors may teach around real situations with students having the opportunity to witness and/or experience the situation each day; and
- o Distribution of workload for faculty.

2. Curriculum

The curriculum consists of course work in a variety of subjects including the biological, physical, and social sciences as well as agricultural subject matter content. Students are required to complete 60 credits in academic subject matter during each of the three years for a total of 180 credits during the three-year period. In addition, students are required to complete 15 one-credit experience modules each year for a total of 45 credits in their educational program. Therefore, Zamoranos graduate from EAP with a total of 180 classroom related instruction credits and 45 field experience instruction credits, all of which are graded on a letter basis. These classes and three-week field experience modules are offered during nine fifteen-week periods over the three year program.

Most college or university academic programs in agriculture require a range of 120 to 200 credits for a B.S. equivalent degree, yet, EAP requires 225 credits for students to become agronomos. This type of program could not be accomplished if it were not for the rigorous effort and dedication by students and faculty over the three-year period.

Since the philosophy of learning by doing prevails in each and every program, one may draw the conclusion that it is strictly a technical school in which there is limited academic education and mostly hands-on experiences. To the contrary, students participate in academic classes and do assignments for each. Classwork is coordinated with field experiences and laboratory education. The school has a broad range of agriculture available, and the climatic conditions are such that they can offer experiences for students throughout the year. Every student, therefore, must proceed through what the administration calls three-week modules for practical application experiences. During the last year, students have some freedom in obtaining greater experience in certain modules, but in the first two years this is predetermined.

The field experience modules (usually three weeks in duration) are designed to accompany course work and enhance student learning by providing hands-on experiences as well as observing and participating in management decisions pertaining to each of the crops and/or livestock enterprises of the school farm.

3. Evaluation of Practical Experience

In order to provide a clear picture of the emphasis of instruction for each module, department chairmen were asked to provide a rating of each module. They were asked to consider the extent to which skills/practices were learned, management of crops was taught, the operation of hand tools or machines by students, products and/or materials handling, commodities produced, human relationships developed, and the amount of physical labor that students exerted. This analysis was made to provide evidence that students were doing and learning more than just how to work during these modules. Department chairmen rated the areas of emphasis per module on the basis of (5) very high, (4) high, (3) medium, (2) low, (1) very low, and (0) none.

a. Horticultural Crops. Data and mean scores in Table X-2 pertain to horticulture modules which are taught primarily to the first-year students. It may be concluded that the physical labor exerted by students in the horticulture modules as well as the commodities produced is relatively high as compared to the other areas of emphasis.

b. Agronomy Field Crops. Information is provided in Table X-3 for the agronomy modules. It can be concluded from the mean scores that the Agronomy Department is placing medium emphasis on each of the areas or a balanced approach to the field experience modules.

c. Livestock. The scores for each area of emphasis for the animal science modules are provided in Table X-4. People relationships developed were rated extremely low, with a high emphasis on skills and practices developed and product handling for the modules in this area.

Too much emphasis should not be placed on the authenticity of the information included in Tables X-2 through X-4 because the data were not obtained from a statistical survey but were only the opinions of the department chairmen. On the other hand, it is evidence of what the leader of the department feels is being accomplished. Some department chairmen obtained opinions and ratings from their faculty and students in order to substantiate their evaluation. What is important to observe is that there is a concerted effort to provide students with a balance of experiences. Of course, the emphasis is different within modules and across the various areas of study.

TABLE X-2. DEPARTMENT CHAIRMAN ASSESSMENT OF LEVEL OF EMPHASIS IN FIELD/LAB EXPERIENCE MODULES IN HORTICULTURE CROPS MANAGEMENT a/

Modules Horticulture	Area of Emphasis Per Module						
	Skills/ Practices Developed	Horticulture Crop Management	Hand Tools Equipment Used	Products/ Materials Handling	Commodities Produced	People Relationships Developed	Physical Labor Exerted
1. Plant Health	2	3	2	4	4	3	4
2. Farm Shop	2	0	3	0	0	2	4
3. Harvesting	2	3	0	0	4	3	4
4. Post Harvest	1	2	0	0	4	3	4
5. Food Processing	3	2	4	3	4	3	4
6. Propagation	3	3	2	0	4	3	4
7. Bees	3	0	3	3	4	3	3
8. Fruit Crops	2	3	3	2	3	2	4
9. Vegetables	3	3	2	2	4	3	5
10. Marketing	0	0	0	0	4	3	4
MEAN SCORE	2.10	1.90	1.90	1.40	3.50	2.80	4.00

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a/ Scale = (5) Very High
 (4) High
 (3) Medium
 (2) Low
 (1) Very Low
 (0) None

TABLE X-3. DEPARTMENT CHAIRMAN ASSESSMENT OF LEVEL OF EMPHASIS IN FIELD/LAB EXPERIENCE MODULES IN FIELD CROP MANAGEMENT a/

Modules Horticulture	Area of Emphasis Per Module						
	Skills/ Practices Developed	Crop/Plot Management	Hand Tool/ Machine Operation	Products/ Materials Handling	Commodities Produced	People Relationships Developed	Physical Labor Exerted
1. Integrated Pest Management	3	3	3	3	2	4	2
2. Entomology	4	4	4	4	4	3	2
3. Plant Pathology	4	2	3	2	3	3	2
4. Weed Science	4	2	2	3	3	3	2
5. Forestry	3	4	4	3	4	3	5
6. Field Crops	3	4	4	4	5	3	5
7. Fish Culture	3	3	4	4	4	3	4
8. Soils	4	2	3	3	3	2	3
9. Agricultural Mechanization	3	3	3	3	3	2	2
10. Vegetable Production	2	2	2	2	3	3	2
11. Seed Technology	5	3	4	3	4	2	3
12. Plant Improvement	2	4	3	4	4	3	3
MEAN SCORE	3.33	3.00	3.25	3.17	3.50	2.83	2.91

a/ Scale = (5) Very High
 (4) High
 (3) Medium
 (2) Low
 (1) Very Low
 (0) None

TABLE X-4. DEPARTMENT CHAIRMAN ASSESSMENT OF LEVEL OF EMPHASIS IN FIELD/LAB EXPERIENCE MODULES IN LIVESTOCK MANAGEMENT a/

Modules Horticulture	Area of Emphasis Per Module						
	Skills/ Practices Developed	Livestock Management	Hand Tool/ Machine Operation	Products/ Materials Handling	Commodities Produced	People Relationships Developed	Physical Labor Exerted
1. Swine Production	4	5	2	3	0	0	4
2. Feed Concentrates	3	0	5	5	0	0	4
3. Sheep and Goats	4	5	1	3	2	0	3
4. Dairy Calves	3	4	2	3	0	0	3
5. Dairy Products	5	0	4	4	4	3*	4
6. Meat	5	3	4	4	4	0	3
7. Animal Health and Reproduction	4	3	3	4	0	0	2
8. Dairy Cattle	4	5	4	4	4	0	4
9. Poultry	4	5	3	3	4	0	3
10. Pasture Management	3	0	2	4	0	0	3
11. Beef Cattle	3	5	3	4	0	0	4
12. Animal Nutrition Laboratory	5	0	5	5	0	0	1
MEAN SCORE	3.91	2.92	3.17	3.83	1.50	0.25	3.17

* A small sales outlet is maintained where students participate.

a/ Scale = (5) Very High
 (4) High
 (3) Medium
 (2) Low
 (1) Very Low
 (0) None

F. Assessment of Competencies Taught

Former graduates of EAP have been surveyed using a personal interview procedure. They have been asked to respond about their academic program and to assess their level of competence in various subject areas as a result of their instructional program at EAP.

During the academic and curriculum review process, department chairmen were asked to make an assessment of their perception on the level of performance of selected skills and competencies which students had acquired during their instructional programs at Zamorano. It may be interesting to observe the relationship of the students' opinions to those of the department chairman because the same instrument format was used for both groups.

An assessment of level of performance for the skills/competencies taught is found in Tables X-5 through X-11. Within these tables, the data are recorded as the percentage of students whom the department chairmen perceived to be in five categories:

- o Those students who did not observe or study the skill or competency;
- o Those that observed or studied the skill or competency but would not be able to perform it;
- o Those students who could perform the skill or competency with supervision;
- o Those who could perform the skill or competency without supervision; and

TABLE X-5. DEPARTMENT CHAIRMAN ASSESSMENT OF LEVELS OF PERFORMANCE FOR COMPETENCIES TAUGHT IN AGRICULTURAL BUSINESS

Competency	Included in Cur- riculum Yes/No	Level of Performance				Able to Teach Others
		Did not Observe or Study	Observed or Studied But Not Able to Perform	Perform With Supervision	Perform Without Supervision	
		-----Percentage of Students-----				
1. Identify and use sources of capital wisely in the establishment and operation of an agricultural business.	Yes		40	40	20	
2. Determine cost of production of agricultural products and services.	Yes		50	40	10	
3. Plan a cash flow and operating budget for a business.	Yes		60	30	10	
4. Develop a business plan for organizing the business.	Yes		60	30	10	
5. Prepare a plan for training business workers to improve labor productivity.	Yes		70	25	5	
6. Describe the influence of public policy on the operation and maintenance of an agricultural non-farm business.	Yes		50	30	20	
7. Prepare, summarize, and interpret financial reports.	Yes		70	25	5	
8. Prepare investment projects.	Yes		50	40	10	
9. Evaluate alternative investment projects.	Yes		50	40	10	
AVERAGE FOR ALL COMPETENCIES/SKILLS			56	33	11	

TABLE X-6. DEPARTMENT CHAIRMAN ASSESSMENT OF LEVELS OF PERFORMANCE FOR COMPETENCIES TAUGHT IN AGRICULTURAL MECHANIZATION

Competency	Included in Cur- riculum Yes/No	Level of Performance				
		Did not Observe or Study	Observed or Studied But Not Able to Perform	Perform With Supervision	Perform Without Supervision	Able to Teach Others
-----Percentage of Students-----						
1. Maintain and use major types of tools (both hand and power operated) used in fabrication and repair of agricultural machines and equipment.	Yes		15	50	30	5
2. Select/calculate the cost and procure the necessary stock material for a planned fabrication project.	Yes	30	5	50	15	
3. Maintain and operate primary tillage, planting, fertilization, and harvesting equipment for crops of economic importance.	Yes		50	30	15	5
4. Calibrate planting fertilization, and pest control equipment employing best known safety precautions and procedures.	Yes		40	30	30	
5. Operate, service, adjust, and make minor repairs on internal combustion engines.	Yes		15	80	5	
6. Determine the appropriate mechanical technology to use to maximize returns to available sources.	Yes		10	40	45	5
7. Follow the safety rules for welding and carpentry.	Yes		25	40	30	5
8. Know the parts of the tractor, its operation and use.	Yes		40	30	20	10
9. Planning for the use of the correct equipment in various situations.	Yes		50	20	20	10
10. Calibration and operation of plows, planters, and cultivators.	Yes		40	25	20	15
11. Know the use of alternative sources of traction (animals) for plowing and planting.	Yes		10	10	50	30
AVERAGE FOR ALL COMPETENCIES/SKILLS		3	27	37	25	8

TABLE X-7. DEPARTMENT CHAIRMAN ASSESSMENT OF LEVELS OF PERFORMANCE FOR COMPETENCIES TAUGHT IN ANIMAL SCIENCE

Competency	Included in Cur- riculum Yes/No	Level of Performance				Able to Teach Others
		Did not Observe or Study	Observed or Studied But Not Able to Perform	Perform With Supervision	Perform Without Supervision	
-----Percentage of Students-----						
1. Use nutrient analyses of livestock feeds common to the area to formulate balanced livestock feed rations.	Yes		5	10	70	15
2. Plan a breeding system that will result in desired genetic improvement of progeny.	Yes		5	30	60	5
3. Diagnose and recommend treatment of common livestock diseases and parasitic infections.	Yes		5	15	70	10
4. Plan shelter and facilities that provide for economical livestock production.	Yes	50	20	25	5	
5. Describe the domestic and international policies that have an impact on the market (supply-demand) for livestock and livestock products.	Yes	35	35	25	5	
6. Plan livestock programs for subsistence and market use that will maximize the return to resources.	Yes		10	45	35	10
7. Know the best process for slaughtering cattle, swine, and poultry.	Yes			30	50	20
8. Know how to process meats.	Yes			75	25	
9. Know how to process milk.	Yes			20	60	20
AVERAGE FOR ALL COMPETENCIES/SKILLS		9	9	31	42	9

TABLE X-8. DEPARTMENT CHAIRMAN ASSESSMENT OF LEVELS OF PERFORMANCE FOR COMPETENCIES TAUGHT IN CROP PRODUCTION

Competency	Included in Cur- riculum Yes/No	Level of Performance				
		Did not Observe or Study	Observed or Studied But Not Able to Perform	Perform With Supervision	Perform Without Supervision	Able to Teach Others
-----Percentage of Students-----						
1. Identify the common parts of all plants and other crops common to the zone where he/she works.	Yes		10	40	40	10
2. Select appropriate crop varieties considering maturity, harvestability, disease resistance, lodging resistance, insect resistance, and yield.	Yes		5	15	60	20
3. Know the essential requirements and steps in preparing a seed bed for crops grown for subsistence and market.	Yes			25	50	25
4. Identify symptoms and causal agents of diseases common to economically important crops. Describe the control measures of diseases common to economically important crops.	Yes		10	40	40	10
5. Identify and describe insects that are beneficial and harmful to economically important crops. Describe the cultural, chemical, and biological control programs for harmful insects.	Yes			20	50	30
6. List the common cultural and chemical methods for weed control.	Yes		10	50	35	
7. Describe advantages and disadvantages of various methods of harvesting economically important crops.	Yes		10	40	40	10
8. Plan a crop storage facility for crops stored for home use/livestock feed or for market.	Yes		15	35	40	10
9. Describe the factors that regulate the market (supply and demand). Describe the factors that determine the price received by sellers throughout the marketing system.	Yes		20	60	20	
AVERAGE FOR ALL COMPETENCIES/SKILLS			9	36	42	13

TABLE X-9. DEPARTMENT CHAIRMAN ASSESSMENT OF LEVELS OF PERFORMANCE FOR COMPETENCIES TAUGHT IN ECONOMIC MANAGEMENT AND MARKETING

Competency	Included in Curriculum Yes/No	Level of Performance				Able to Teach Others
		Did not Observe or Study	Observed But Not Able to Perform	Perform With Supervision	Perform Without Supervision	
-----Percentage of Students-----						
1. Determine the marketing alternatives available for agricultural products that will secure the best price for sellers.	Yes		80	20		
2. Calculate expected returns and profits from individual enterprises and combinations of enterprises on farms of various sizes.	Yes		50	30	20	
3. Compare and contrast individual, cooperative, and corporate marketing strategies and describe the potential advantages and disadvantages of each strategy.	Yes		50	30	20	
4. Identify sources of credit for agriculture and the most appropriate use of credit in the agricultural sector.	Yes		60	20	20	
5. Prepare a budget for a farm or related business.	Yes		50	30	20	
6. List steps to follow in managing the farm business to maximize returns to available sources.	Yes		60	30	10	
7. Describe the government policies that affect the operation and maintenance of an agribusiness.	Yes		50	30	20	
8. Summarize and analyze the records of a farm or non-farm business to determine strengths or weaknesses of the business operation.	Yes		60	30	10	
9. Processing and analysis of biological and economical phenomenon and interpretation of results to be used in the decision-making process.	Yes			5	70	25
10. Establishment of experimental designs and ability to interpret statistical results.	Yes			15	70	15
AVERAGE FOR ALL COMPETENCIES/SKILLS			58	28	15	

Competency	Included in Cur- riculum Yes/No	Level of Performance				Able to Teach Others
		Did not Observe or Study	Observed But Not Able to Perform	Perform With Supervision	Perform Without Supervision	
-----Percentage of Students-----						
1. Identify the common parts of horti- cultural plants and list their major function.	Yes				85	15
2. Select appropriate fruit, vegetable, and ornamental plants, based on maturity, harvestability, disease resistance, in- sect resistance, and yield for different environmental conditions.	No	100				
3. List the seedbed preparation and propagation requirements for fruits and vegetables common to that environment.	Yes		10	80	10	
4. Identify symptoms, names, and causal agent diseases common to fruits and vegetables in tropical America.	Yes			60	40	
5. Identify the insects that are bene- ficial and harmful to the economically important fruit, vegetable and ornamental crops.	Yes		25	50	25	
6. Describe the common cultural and chemical weed control methods in fruit, vegetable, and ornamental horticultural crops.	Yes		5	95		
7. Describe the harvest and storage of horticulture crops for maintaining quality and maximizing yield.	No	90		10		
8. Identify tree species and characteristics suitable for culture in various areas of tropical America for commercial use.	Yes		10	90		
9. Describe nursery procedures for pro- cedures for propagation of tree seed- lings to be used in reforestation programs.	Yes		10	90		
10. Utilize methods for protection against forest fires, insects, diseases, and forest animals.	Yes		10	90		
11. Identify multiple use of forests and the effect on our environment of com- mercial, exotic, or native species common to tropical and sub-tropical America.	Yes		10	90		
AVERAGE FOR ALL COMPETENCIES/SKILLS		17	7	60	15	1

TABLE X-11. DEPARTMENT CHAIRMAN ASSESSMENT OF LEVELS OF PERFORMANCE FOR COMPETENCIES TAUGHT IN SOILS, SOIL FERTILITY, AND CONSERVATION

Competency	Included in Cur- riculum Yes/No	Level of Performance				Able to Teach Others
		Did not Observe or Study	Observed or Studied But Not Able to Perform	Perform With Supervision	Perform Without Supervision	
		-----Percentage of Students-----				
1. Describe the physical features, degree of erosion, internal drainage, soil texture, and topography.	Yes		10	50	35	5
2. Plan a land use program on the basis of capability classification that will maximize productivity and protect soil from erosion.	Yes		5	40	40	15
3. Test and interpret soil test results and make fertilizer recommendations based upon yield goals.	Yes		20	50	20	
4. Recognize nutrient deficiency in soils through plant symptoms and know how to correct the problem.	Yes		10	30	50	10
5. Apply or recommend applications of various fertilizer materials at optimum time.	Yes			30	60	10
6. Describe the proper conservation practices with various land capability classes. Plan a crop rotation system.	Yes		10	60	30	
7. Select tillage practices that maintain soil structure and reduce compaction and soil erosion.	Yes		5	25	55	15
AVERAGE FOR ALL COMPETENCIES/SKILLS			6	36	47	11

- o Those students who were competent enough to teach other students how to perform the skill or competency.

As can be observed, there is more difference in the ratings across areas of instruction than there is among the skills or competencies within an area of instruction. This is probably due to the situation that different department chairmen were rating their own areas of teaching which reflects one person's opinion.

In order to grasp an overview of how department chairmen rated the level of student performance for all areas of instruction, a summary with mean ratings may be found in Table X-12. The department chairmen indicate that only 4 percent of the students did not study or observe the skill or competency while 25 percent observed or studied the skill or competency but would not be able to perform it as a graduate. It was estimated that over one-third (37.3 percent) of the students could perform the skill or competency without supervision, and over one-fourth (28.1 percent) could perform the skill or competency with supervision. Six percent had learned the skill or competency well enough that they would be able to teach it to others. These data are evidence of a high level of performance by EAP students.

Comparisons of department chairmen's ratings of student performance were made with employer ratings and are presented in Chapter XI.

TABLE X-12. DEPARTMENT CHAIRMAN ASSESSMENT OF LEVELS OF PERFORMANCE FOR COMPETENCIES TAUGHT: SUMMARY

Competency	Included in Cur- riculum Yes/No	Level of Performance				Able to Teach Others
		Did not Observe or Study	Observed or Studied But Not Able to Perform	Perform With Supervision	Perform Without Supervision	
		-----Percentage of Students-----				
1. Agricultural Business		56	33	11		
2. Agricultural Mechanization	3	27	37	25	8	
3. Animal Science	9	9	31	42	9	
4. Crop Production		9	36	42	13	
5. Economic Management and Marketing		58	28	15		
6. Horticulture	17	7	60	15	1	
7. Soils, Soil Fertility, and Conservation		6	36	47	11	
AVERAGE FOR ALL COMPETENCIES/SKILLS	4	25	28	37	6	

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G. Observations and Conclusions
of EAP Assessment

1. Strengths

To highlight the educational program at EAP and to accentuate important items about the program that may not have been included in the previous materials of this report, the following notes are presented.

- o There is a well-educated, committed, energetic, and loyal faculty at this institution. The faculty has changed considerably over the past few years, and a majority have been recruited and hired by the present EAP director.
- o The student body (430 young men and women from sixteen Latin American countries) are sincere, conscientious, and pleased with and proud of the education they are receiving.
- o There is evidence of excellent organization. Faculty know their responsibility and perform their teaching and counseling in a dedicated manner.
- o The schedule which students and faculty maintain has been arranged to provide for efficiency and meet the needs of the students.
- o EAP is an international school for students learning about agriculture.
- o When students are asked what they think of their educational program, a common response is "It's tough but I like it because I'm learning."

- o Students are goal oriented. They appear to be at EAP for learning; and there appears to be little time wasted.
- o The school has purchased and maintained modern equipment for teaching.
- o The post-harvest marketing facility (a new addition) provides an excellent experience for students as well as good service for the community in providing high quality food products for sale.
- o The integrated pest management (IPM) program is a positive dimension to the program and is especially valuable because it is offered sequentially in all three years. The teaching materials that are being developed for student use are practical and of high quality.
- o The development of instructional guides for the field experience modules is very beneficial, and it will be a major accomplishment when guides have been prepared for all 45 modules.
- o The utilization of EAP graduates as student instructors for a two-year period is an experience of great value while teaching at EAP. It is another dimension to their education in preparation for completing the Bachelor's degree or entering their chosen occupation.
- o Leadership opportunities are being offered to second and third-year students through the provision of their serving as leaders of students in field experience modules. The operation of this system is difficult, yet it works well and students respect their student leaders in each module.

- o In spite of the rigorous schedule, long days, and pressure to learn on students and for faculty to produce and work long days and weeks, the morale of the total student body and faculty is very positive.
- o The utilization of a committee for curriculum consideration and revision of courses and planning for program expansion is commendable.
- o The administration of EAP is concerned and dedicated to the improvement and development of the total program, i.e., student services, academic policies, curriculum offerings, space and equipment.
- o The provision of brief instruction in the agricultural mechanics area in using animal traction is appropriate, as some graduates may have the opportunity to utilize or supervise this type of mechanization in their future work.
- o This school is not one that uses only demonstration in teaching but also provides the opportunity for students to perform the skills and become proficient in most competencies. This is possible primarily because of the volume and varied production on the school farm to provide the experiences.
- o The instructional program at EAP appears to focus much more toward the student who will enter an agriculture business production and/or management operation or farming of large-scale rather than returning to the operation of a small peasant-type farm.

- o Human relationships seem to be taught using a subtle approach such as student leaders for various activities including leadership for field experience module instruction and within the dormitories.
- o The new procedure of using the Spanish version of the Scholastic Aptitude Test (S.A.T.) for admission may be very beneficial; at present, there appears to be little correlation between students' academic achievement and their secondary education grades.
- o Graduates from EAP appear to be limited in beginning salaries and possibly the advantage of acquiring prestigious positions when they enter government work because they do not possess an Ingeniero Agronomo or Bachelor's Degree. Even though their educational program may be comparable, if they do not have the degree, they are subject to discrimination.

2. Suggestions for Improvements

During the review process a constant effort was made to determine helpful ideas and suggestions that could be implemented over time which may be beneficial to the program. They are presented as follows:

- o Conduct a one or two week seminar and/or workshop on teaching methods for graduates who will be serving as instructors.
- o Consider a balance of more agricultural subject matter courses with the basic sciences for the first-year students.

- o Review and possibly revise the academic drop policy. Students may need more time for adjustment during their first trimester.
- o In Latin American countries where the graduates reside, there is a need for emphasis on soil and water conservation. Possibly a course on this topic should be introduced in the curriculum.
- o Since there is a general concern among students and most faculty that students are not as proficient in mathematics as they should be, possibly a redirection or change in emphasis within the mathematics teaching program should be addressed.
- o Most students are becoming proficient in English as evidenced by their ability to pass the TOEFL examination and succeed when they enter English-speaking institutions; yet, 24 credits of English instruction within the curriculum of 180 credits seems to be rather high for the degree of English proficiency which students achieve. Possibly a study of how other institutions teach their intensive English programs may be advantageous. This may result in the adopting of some new procedures, such as using individualized learning packages, that may result in more efficiency for students learning the English language.
- o If farm enterprise records can be maintained, they could be used to provide real and current information for classroom teaching in agricultural economics. The records would also be beneficial for school farm management.

- o A small gas engines unit could be added to the agricultural mechanization program. This would not be an expensive addition and it could be taught as one of the field experience modules with considerable opportunity for practical experience. Students would learn the basic principles of engine operation as well as maintenance and repairs which are needed in Latin America.
- o A program of in-service education for faculty would enhance their ability in teaching. This program may include topics such as teaching methods, test construction, student evaluation, and audio visual materials development and use.
- o A "down link dish" for television reception would provide students an opportunity for individualized instruction through television. This may be new now, with relatively few programs available, but should be considered for the future. This may be especially beneficial as supplemental instruction in the areas of language and mathematics.
- o Establish a center for instructional materials development with a qualified staff member to assist faculty with their teaching materials and methods.

H. EAP Evaluation Summary

EAP-Zamorano possesses an excellent educational program. Students who graduate from EAP are well prepared and possess a high level of competency. The program is rigorous, yet highly respected and accepted by faculty, students, and alumni. It is a unique educational institution in that it provides students such a broad based education in fundamental agriculture and not just emphasis in one or more areas. It does not offer majors, but students gain a balanced education especially in horticulture, agronomy, and animal science with instruction in several related areas.

XI. COMPARISON OF PERFORMANCE LEVEL OF COMPETENCIES

A major objective of the study was to make a qualitative evaluation of the EAP curriculum. There were four components in the qualitative study:

- o To assess the level of competence that faculty perceived the graduates of EAP possessed upon graduation.
- o To assess the level of competence employers of EAP graduates perceived the graduates to have when initially employed.
- o To determine the level of competence EAP graduate employers would have preferred the EAP graduates to have upon initial employment.
- o To determine the level of competence EAP graduate employers and other employers would expect to find in future employees with the level of education provided by EAP.

It is recognized that the whole continuum of competencies is not addressed in this qualitative study. Instead, the competencies should be considered as a sampling of the continuum in each major curriculum area.

A. Methodology

The list of competencies and skills was devised by searching the literature in the United States for competency lists that were descriptive of the program of study at EAP and which were thought to have some application to tropical agriculture in Latin America. The long list of competencies was then submitted to a panel of judges for review and refinement before incorporation into the research process. The identical list of compe-

tencies was used in assessment of the EAP curriculum, the employers' perceptions of EAP graduates, and the perception of employers not hiring EAP graduates (non-EAP employers).

Responses from EAP graduate employers were collected by enumerators in an interview setting. Each employer was asked to respond to each competency three times--first, to assess the level of competency the EAP graduate had when first employed; second, to provide information on the level of competency the employer would have preferred the EAP graduate to possess; and third, to estimate the level of competence the employer would expect future employees to possess.

Enumerators also asked non-EAP graduate employers to respond to the same competencies, but since they had no known EAP graduate employees when selected for the interview, they were asked only about their perceptions of the level of competence they expected in future employees they might hire.

Assessment of the EAP curriculum was a two-stage process. Examination of curriculum determined if the competency was included in the course of the study at EAP. From this examination it was also determined if other competencies should be added to the list for each study area.

When the complete list was compiled for each area, the chairman of the department to which the competency related was asked to assess the level at which it was taught. The faculty members were asked to estimate the percentage of graduates that could be expected to perform at the various levels. This assessment took into account both the classroom and field/laboratory experience modules.

The results of the qualitative analysis of competencies are reported in Tables XI-1 through XI-8. The competencies are examined in the same numerical order in which they were presented to the respondents, with additional competencies, when appropriate, added at the time of the EAP evaluation to the original list.

Each table has five responses per competency if it was included on the original list. However, competencies added during the EAP evaluation have only the EAP faculty assessment. Table XI-8, "Communication and Human Relation Skills," was not assessed at EAP. Each response has five different categories for the rating of competency level of performance:

- o The assessment made by EAP faculty of the level of performance of graduates.
- o EAP employer assessments of the level of graduate performance possessed at the time of hiring.
- o EAP employer assessment of the level of performance they would have preferred the EAP graduate employee to have obtained before employment.
- o EAP graduate employer estimates of the level of performance they would expect in future employees.
- o Non-EAP graduate employer estimates of the level of performance they anticipate in future employees.

Also reported in Table XI-1b through XI-8b is the percent of the employers who indicated that the competency was not needed or used by their employees. The percentage responses under the five categories that describe level of performance are based on the number of employees who reported that the

competency was needed as used in their business or agency enterprise. Percentages have been rounded to the nearest whole number so in some cases do not total 100 percent by plus or minus 1 percent.

Each study area is discussed separately in this report; however, there are a few general observations the reader may wish to keep in mind when reviewing the data.

- o All of the competencies listed except two in the horticulture area were claimed to be taught as part of the EAP curriculum.
- o As a general rule, employers ranked the graduates' level of competence in the highest level, "ability to teach others," category more frequently than did EAP faculty.
- o More employers reported that the student had not studied or observed the competency than did EAP faculty.
- o Almost without exception, employers would have preferred the EAP graduates to possess a higher level of performance than actually exhibited by the graduates.
- o Almost without exception, the employers of EAP graduates expect to hire persons in the future with a higher level of skill than now possessed by EAP graduates.
- o Expectation for the level of performance for future employees is higher for EAP graduate employers than for the non-EAP employers.
- o Employers expect future employees to use the competency to a greater extent than is now done, although the difference in most cases is too small to indicate any major change in job descriptions of employees.

To assist in the interpretation of the assessment of competencies in each of the eight areas, each major table reports percentage responses accompanied by a summary that provides an overall view of the degree of agreement among the comparisons. The comparisons made in the summary tables (Tables XI-1a - XI-8a) examine both high-level performance ratings (ability to perform the task without supervision or ability to teach others) and all levels of performance (performance of the task either with or without supervision or ability to teach others).

In the high-level performance category, four comparisons were made:

- o EAP faculty assessment of performance compared to EAP employers' assessment of EAP graduate's initial performance.
- o EAP employers' assessment of initial performance of the EAP graduate compared to the level of performance preferred by the EAP employer.
- o EAP employers' assessment of initial performance of the EAP graduate compared to the level of performance expected from employees in the near (five to seven years) future.
- o EAP employers' assessment of initial performance of the EAP graduate compared to the level of performance expected in the near (five to seven years) future by employers who were not known to employ EAP graduates.

On each comparison a decision rule (discussed later in this section) was determined a priori to help identify ratings that were significantly different from each other. The second level of analysis was based on the comparison of whether or not the

employee could (or should) perform the competency as opposed to not being able to perform the competency. This is a broader based comparison relying only on the dichotomous choice--perform or not perform. It does not attempt to measure the difference in the various levels of performance but serves only to differentiate between those who can or are expected to be able to perform and those who cannot or are not expected to perform. Again, certain decision rules were established a priori to signal those competencies where there is no reasonably close agreement between and among the ratings.

For this second analysis, a slightly different set of comparisons was made concentrating more heavily upon the assessments made by the EAP faculty of the performance of the graduates. Five comparisons were made:

- o EAP faculty assessment of performance compared to EAP employers' assessment of EAP graduates' initial performance.
- o EAP faculty assessment of EAP graduate performance compared to the EAP employers' assessment of the preferred level of performance.
- o EAP employers' assessment of the initial performance of EAP graduates compared to their preferred level of performance.
- o EAP employers' assessment of the initial performance of EAP graduates compared to their projection of performance expected in the future.
- o EAP employers' assessment of initial performance of EAP graduates compared to the projection of performance expected in the future by employers not known to employ EAP graduates.

In six of the eight comparisons, the decision rule used to flag differences was a plus or minus 20 percent (+20 percent). For example, if the assessment by the EAP faculty of graduate performance was within +19 percent of the level of performance of EAP graduates reported by employers of EAP graduates, no flag was raised. If the comparison was +/=20 percent or -/=20 percent, a notation was made that there were differences to which one should be alert. For the high-level performance analysis, a more lenient decision rule was adopted when comparing assessment of performance of graduates made by EAP graduate employers and the levels of performance expected in the future by both EAP graduate employers and non-EAP graduate employers. It was obvious from examination of the data that almost without fail the flag would have been raised had the +20 percent decision rule been applied. Little would have been learned from the later comparison, since it would not differentiate those competencies that were clearly below the expected standards from those that might be in an acceptable range. The comparison with future expectations for high levels of performance was therefore set at +30 percent.

B. Performance Assessment

Assessments of performance are presented in summaries (Tables IX-1a-IX-8a) of each of the eight agriculture/agribusiness segments with the following key to an understanding of performance assessments.

KEY: Comparisons of Levels of Graduate Competencies

- + The performance assessment by the employers of graduates exceeds the assessment being compared by at least 20 points (each point = 1 percent of the responses in each category), with the following exceptions:

1. For high levels of performance expected by employers in the future, the differential is 30 points.
 2. For the right hand column, it is the faculty assessment that exceeds the EAP employer preferred level of performance by 20 points.
- The performance assessment by the employer of graduates is lower than the assessment it is compared with by at least 20 points, with the following exceptions:
1. For high levels of performance expected by the employers in the future, the differential is 30 points.
 2. For the right hand column, it is the faculty assessment that is lower than the EAP employer preferred level of performance by 20 points.
- o The two assessment scores being compared are within the acceptable range of +/- 30 points as applicable (see the exception above).

1. Agricultural Business

The EAP faculty assessment of graduates' performance in agricultural business is considerably below the level of competence actually reported by employers of EAP graduates. On six of the seven competencies evaluated, employers rated EAP graduates significantly higher than did EAP faculty. However, in all seven competencies, employers preferred graduates to possess a significantly higher level of competence than they initially possessed when employed (Tables XI.1a and 1b).

TABLE XI-1a. AGRICULTURAL BUSINESS--SUMMARY OF GRADUATE PERFORMANCE:
COMPARISON OF EAP FACULTY, EAP EMPLOYERS AND OTHER EMPLOYERS

From Table XI-1b	EAP Employer Performance Assessment Versus						Faculty Assessment Versus Employer Preferred Performance		
	Own Preferred Performance B vs. C	Own Future Expectations B vs. D		Other Employer Future Expectations B vs. E		Faculty Performance Assessment B vs. A		Employer Preferred Performance A vs. C	
	High Levels a/	High Levels b/	All Levels b/	High Levels a/	All Levels b/	High Levels a/	All Levels b/	All Levels b/	
1. Identify and use sources of capital wisely in the establishment and operation of an agricultural business.	-	-	-	o	o	+	o	-	
2. Determine cost of production of agricultural products and services	-	-	o	o	o	+	+	-	
3. Plan a cash flow and operating budget for a business.	-	-	o	o	o	+	+	-	
4. Develop a business plan for organizing and operating the business.	-	-	-	o	o	+	+	-	
5. Prepare a plan for training business workers to improve labor productivity.	-	-	-	o	-	+	+	-	
6. Describe the influence of public policy on the operation and maintenance of an agricultural non-farm business.	-	-	-	o	-	o	o	-	
7. Prepare, summarize and interpret financial reports.	-	-	-	o	o	+	+	-	
8. Prepare investment projects.									
9. Evaluate alternative investment projects.									

SUMMARY: Number of Competencies:

o	Within acceptable range	0	0	2	7	5	1	2	0
+	At least 20% above	0	NA	0	NA	0	6	5	0
-	At least 20% below	7	NA	5	NA	2	0	0	7
+	At least 30% above		0		0				
-	At least 30% below		7		0				

a/ Includes ability to perform without supervision and ability to teach others

b/ Includes high level plus ability to perform with supervision

KEY: Comparisons of Levels of Graduate Competencies

- + The performance assessment by the employers of graduates exceeds the assessment being compared by at least 20 points (each point = 1 percent of the responses in each category), with the following exceptions:
 1. For high levels of performance expected by employers in the future, the differential is 30 points.
 2. For the right hand column, it is the faculty assessment that exceeds the EAP employer preferred level of performance by 20 points.
- The performance assessment by the employer of graduates is lower than the assessment it is compared with by at least 20 points, with the following exceptions:
 1. For high levels of performance expected by the employers in the future, the differential is 30 points.
 2. For the right hand column, it is the faculty assessment that is lower than the EAP employer preferred level of performance by 20 points.
- o The two assessment scores being compared are within the acceptable range of +/- 30 points as applicable (see the exception above).

TABLE XI-1b. AGRICULTURAL BUSINESS: FACULTY AND EMPLOYER ASSESSMENT OF COMPETENCIES

	Basis for Rating <u>a/</u>	Level of Graduate Performance					
		Percent Not Using the Skill or Competency	Did Not Observe or Study	Observed or Studied But Not Able to Perform	Perform with Supervision	Perform without Supervision	Able to Teach Others
-----percent-----							
1. Identify and use sources of capital wisely in the establishment and operation of an agricultural business.	A	--	0	40	40	20	0
	B	65	15	12	33	35	5
	C	62	1	6	24	46	23
	D	61	0	2	21	34	43
	E	61	2	10	37	31	22
2. Determine cost of production of agricultural products and services	A	--	0	50	40	10	0
	B	62	9	11	29	39	12
	C	61	0	3	15	49	33
	D	59	0	2	12	37	49
	E	58	1	6	35	36	24
3. Plan a cash flow and operating budget for a business.	A	--	0	60	30	10	0
	B	60	10	12	35	35	8
	C	59	1	5	20	46	27
	D	59	0	5	18	35	42
	E	59	1	10	35	30	24
4. Develop a business plan for organizing and operating the business.	A	--	0	60	30	10	0
	B	59	11	12	33	36	8
	C	58	0	3	20	52	25
	D	57	0	2	13	42	44
	E	55	0	5	35	36	24
5. Prepare a plan for training business workers to improve labor productivity.	A	--	0	70	25	5	0
	B	65	8	19	32	32	9
	C	63	1	10	13	53	23
	D	62	1	5	7	42	45
	E	53	1	4	29	32	34
6. Describe the influence of public policy on the operation and maintenance of an agricultural non-farm business.	A	--	0	50	30	20	0
	B	68	13	24	33	23	7
	C	68	0	13	22	43	22
	D	67	0	9	15	42	34
	E	60	3	15	33	28	22
7. Prepare, summarize and interpret financial reports.	A	--	0	70	25	5	0
	B	62	13	15	40	23	8
	C	61	0	10	16	49	24
	D	62	0	4	14	40	42
	E	58	3	9	33	31	25
8. Prepare investment projects.	A	--	0	50	40	10	0
	B	--	--	--	--	--	--
	C	--	--	--	--	--	--
	D	--	--	--	--	--	--
	E	--	--	--	--	--	--
9. Evaluate alternative investment projects.	A	--	0	50	40	10	0
	B	--	--	--	--	--	--
	C	--	--	--	--	--	--
	D	--	--	--	--	--	--
	E	--	--	--	--	--	--

a/ A. EAP faculty assessment of EAP graduates competency
 B. Employer assessment of EAP graduates competency
 C. EAP employer assessment of preferred competency level
 D. EAP employer assessment of future expectation
 E. Non-EAP employer assessment of future expectations

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When comparing high-level performance categories of graduates with expectations in the future, employers of EAP graduates still expected them to be significantly better than their assessment of past graduates in all of the seven competencies. On the other hand, when compared to the EAP graduate employer assessment of EAP graduates, non-EAP graduate employers judged that future requirements in all seven competencies were within the acceptable performance range (Table IX-1a and XI-1b).

When the whole range of performance was compared among ratings, there was little change from the high level assessment comparisons. The EAP faculty assessment was significantly below both actual and preferred performance. Actual performance was below future expectations for EAP graduate employers in five of the seven competencies and within acceptable performance range for five of the seven competencies when compared to non-EAP employers' perceptions of future needs.

From 59 to 68 percent of the employers indicated the agricultural business competencies were not used by EAP graduates when initially employed. All groups of employers agree that greater use of these competencies will be required in future employment than has been in the past.

A competency that more than one-third of the EAP graduates could not perform was "to describe the influence of public policy on the operation and maintenance of an agricultural non-farm business." Expectations of EAP graduate employers were that 76 percent of future employees should perform at a high level, sufficient to perform the skill without supervision or be able to teach others.

This general area of agricultural business appears to be in need of careful review. With the relatively high level of expectation by employers and the fairly low level of performance

(20-37 percent could not perform), and the assessment by faculty that high-level performance is not emphasized, there is cause for critical examination of this area of the curriculum. On the survey of graduates, the business administration area ranked among the lowest in student satisfaction with the program.

2. Agricultural Mechanization

Agricultural mechanics competencies were used by only 22 to 31 percent of the EAP graduates. For those who used the competencies, except for competency 1 (Table XI-2b), there was less disparity among the ratings than for any of the other major curriculum areas. For 30 of the comparisons, the differences in performance between groups were within the acceptable ranges, while the comparisons were flagged for examination in only 18 cases. There was no disparity between the performance of EAP graduates and the expectation of employers for future hires. Competency 1, "Maintain and Use Major Types of Tools," should be a cause of concern since 68 percent of the employers requiring the competency indicated the graduate could not perform, while EAP faculty assessments indicated only 15 percent would not be able to perform. The graduates, when surveyed, also expressed the most dissatisfaction with the agricultural mechanics area of any of the technical skill areas cited in the survey. This dissatisfaction was also mentioned by several graduates in the open-ended narrative assessments of EAP.

3. Animal Science/Livestock

The level of animal science competencies achieved is similar to that of agricultural mechanics; according to employers, 20 to 29 percent of the graduates used the competencies. EAP faculty overestimated high level of performance of graduates when compared to the ratings given by employers on three of the six competencies (Table XI-3a and 3b). For one competency, the faculty estimate was below actual performance and two competencies

TABLE XI-2a. AGRICULTURAL MECHANIZATION--SUMMARY OF GRADUATE PERFORMANCE:
COMPARISON OF EAP FACULTY, EAP EMPLOYERS AND OTHER EMPLOYERS

From Table XI-2b	EAP Employer Performance Assessment Versus						Faculty Assessment Versus Employer Preferred Performance		
	Own Preferred Performance B vs. C	Own Future Expectations B vs. D		Other Employer Future Expectations B vs. E		Faculty Performance Assessment B vs. A		Employer Preferred Performance A vs. C	
	High Levels <u>a</u> /	High Levels <u>b</u> /	All Levels <u>b</u> /	High Levels <u>a</u> /	All Levels <u>b</u> /	High Levels <u>a</u> /	All Levels <u>b</u> /	All Levels <u>b</u> /	
1. Maintain and use major types of tools (both hand and power operated) used in fabrication and repair of agricultural machines and equipment	-	-	-	-	-	-	-	0	
2. Select/calculate the cost and procure the necessary stock material for a planned fabrication project.	0	0	0	0	0	+	+	-	
3. Maintain and operate primary tillage, planting, fertilization, and harvesting equipment for crops of economic importance.	0	0	0	0	0	+	+	-	
4. Calibrate planting fertilization, and pest control equipment employing best known safety precautions and procedures.	0	0	0	0	0	+	+	-	
5. Operate, service, adjust and make minor repairs on internal combustion engines.	0	0	0	0	0	+	0	0	
6. Determine the appropriate mechanical technology to use to maximize returns to available sources.	0	0	0	0	0	0	0	0	
7. Follow the safety rules for welding and carpentry									
8. Know the parts of the tractor, its operation and use.									
9. Planning for the use of the correct equipment in various situations.									
10. Calibration and operation of plow, planters, and cultivators.									
11. Know the use of alternative sources of traction (animals) for plowing and planting.									

SUMMARY: Number of Competencies:

0	Within acceptable range	5	5	5	5	5	1	2	3
+	At least 20% above	0	NA	0	NA	0	4	3	0
-	At least 20% below	1	NA	1	NA	1	1	1	3
+	At least 30% above		0		0				
-	At least 30% below		1		1				

a/ Includes ability to perform without supervision and ability to teach others
b/ Includes high level plus ability to perform with supervision

KEY: See Table XI-1a

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TABLE XI-2b. AGRICULTURAL MECHANIZATION: FACULTY AND EMPLOYER ASSESSMENT OF COMPETENCIES

	Basis for Rating ^{a/}	Level of Graduate Performance					Able to Teach Others
		Percent Not Using the Skill or Competency	Did Not Observe or Study	Observed or Studied But Not Able to Perform	Perform with Supervision	Perform without Supervision	
-----percent-----							
1. Maintain and use major types of tools (both hand and power operated) used in fabrication and repair of agricultural machines and equipment.	A	--	0	15	50	30	5
	B	69	54	14	17	4	7
	C	78	4	15	33	25	23
	D	75	2	9	18	36	36
	E	69	3	16	25	30	25
2. Select/calculate the cost and procure the necessary stock material for a planned fabrication project.	A	--	30	5	50	15	0
	B	71	3	8	26	37	26
	C	76	5	3	43	29	21
	D	68	0	3	25	36	36
	E	67	1	8	33	37	21
3. Maintain and operate primary tillage, planting, fertilization, and harvesting equipment for crops of economic importance.	A	--	0	50	30	15	5
	B	77	2	13	23	37	25
	C	79	2	15	32	38	13
	D	76	0	13	13	17	26
	E	72	1	20	23	30	26
4. Calibrate planting fertilization, and pest control equipment employing best known safety precautions and procedures.	A	--	0	40	30	30	0
	B	76	6	9	19	28	39
	C	75	2	18	20	43	18
	D	73	0	7	7	52	33
	E	68	1	10	12	41	36
5. Operate, service, adjust and make minor repairs on internal combustion engines.	A	--	0	15	80	5	0
	B	78	6	13	19	27	35
	C	83	11	18	26	39	5
	D	79	2	15	20	33	30
	E	76	5	32	21	23	19
6. Determine the appropriate mechanical technology to use to maximize returns to available sources.	A	--	0	10	40	45	5
	B	77	4	10	26	40	20
	C	75	4	13	31	40	13
	D	73	0	10	15	36	39
	E	66	3	9	24	36	28
7. Follow the safety rules for welding and carpentry	A	--	0	25	40	30	5
8. Know the parts of the tractor, its operation and use.	A	--	0	40	30	20	10
9. Planning for the use of the correct equipment in various situations.	A	--	0	50	20	20	10
10. Calibration and operation of plow, planters, and cultivators.	A	--	0	40	25	20	15
11. Know the use of alternative sources of traction (animals) for plowing and planting.	A	--	0	10	10	50	30

^{a/} A. EAP faculty assessment of EAP graduates competency
 B. Employer assessment of EAP graduates competency
 C. EAP employer assessment of preferred competency level
 D. EAP employer assessment of future expectation
 E. Non-EAP employer assessment of future expectations

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TABLE XI-3a. ANIMAL SCIENCE/LIVESTOCK--SUMMARY OF GRADUATE PERFORMANCE:
COMPARISON OF EAP FACULTY, EAP EMPLOYERS AND OTHER EMPLOYERS

From Table XI-3b	EAP Employer Performance Assessment Versus						Faculty Assessment Versus Employer Preferred Performance		
	Own Preferred Performance B vs. C	Own Future Expectations B vs. D		Other Employer Future Expectations B vs. E		Faculty Performance Assessment B vs. A		Employer Preferred Performance A vs. C	
	High Levels <u>a/</u>	High Levels <u>b/</u>	All Levels <u>b/</u>	High Levels <u>a/</u>	All Levels <u>b/</u>	High Levels <u>a/</u>	All Levels <u>b/</u>	All Levels <u>b/</u>	
1. Use nutrient analyses of livestock feeds common to the area to formulate balanced livestock feed rations.	-	-	o	o	o	-	-	o	
2. Plan a breeding system that will result in desired genetic improvement of progeny.	-	-	-	o	o	-	-	o	
3. Diagnose and recommend treatment for common livestock diseases and parasitic infections.	o	-	-	o	o	-	o	o	
4. Plan shelter and facilities that provide for economical livestock production.	-	-	o	o	o	+	+	-	
5. Describe the domestic and international policies that have an impact on the market (supply-demand) for livestock and livestock products.	-	-	-	-	-	o	+	-	
6. Plan livestock programs for subsistence and market use that will maximize the return to resources.	-	-	-	o	o	o	o	o	
7. Know the best process for slaughtering cattle, swine and poultry. <u>c/</u>	-	-	-	-	-	NA	NA	NA	
8. Know how to process meats									
9. Know how to process milk									

SUMMARY: Number of Competencies:

o Within acceptable range	1	0	2	5	5	2	2	4
+ At least 20% above	0	NA	0	NA	0	1	3	0
- At least 20% below	6	NA	5	NA	2	4	2	2
+ At least 30% above		0		0				
- At least 30% below		7		2				

a/ Includes ability to perform without supervision and ability to teach others

b/ Includes high level plus ability to perform with supervision

c/ Not included in narrative presentation, since the same competency was not used by all readers

KEY: See Table XI-1a

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TABLE XI-3b. ANIMAL SCIENCE/LIVESTOCK: FACULTY AND EMPLOYER ASSESSMENT OF COMPETENCIES

	Basis for Rating a/	Level of Graduate Performance					Able to Teach Others
		Percent Not Using the Skill or Competency	Did Not Observe or Study	Observed or Studied But Not Able to Perform	Perform with Super- vision	Perform without Super- vision	
-----percent-----							
1. Use nutrient analyses of livestock feeds common to the area to formulate balanced livestock feed rations.	A	--	0	5	10	70	15
	B	72	5	21	40	31	3
	C	71	2	9	20	53	16
	D	69	0	7	18	38	37
	E	62	2	15	22	33	27
2. Plan a breeding system that will result in desired genetic improvement of progeny.	A	--	0	5	30	60	5
	B	72	2	26	31	29	13
	C	71	0	17	14	44	25
	D	71	-	8	12	40	40
	E	65	3	12	25	31	29
3. Diagnose and recommend treatment for common livestock diseases and parasitic infections.	A	--	0	5	15	70	10
	B	69	7	15	22	44	12
	C	69	0	4	21	44	31
	D	68	0	1	11	37	51
	E	58	0	6	10	34	49
4. Plan shelter and facilities that provide for economical livestock production.	A	--	50	20	25	5	0
	B	69	6	16	28	40	10
	C	68	0	6	17	49	28
	D	68	1	3	10	36	50
	E	62	1	9	20	40	31
5. Describe the domestic and international policies that have an impact on the market (supply-demand) for livestock and livestock products.	A	--	35	35	25	5	0
	B	78	27	23	31	17	2
	C	79	2	15	19	43	21
	D	77	2	12	24	30	32
	E	71	2	21	25	31	21
6. Plan livestock programs for subsistence and market use that will maximize the return to resources.	A	--	0	10	45	35	10
	B	68	8	20	28	30	14
	C	68	1	8	18	43	29
	D	67	1	4	10	37	48
	E	65	0	13	20	39	27
7. Know the best process for slaughtering cattle, swine and poultry.	A	--	0	0	30	50	20
	B	80	11	30	30	18	11
	C	78	2	18	20	33	27
	D	77	2	8	20	25	45
	E	70	4	17	19	32	28
8. Know how to process meats	A		0	0	75	25	0
9. Know how to process milk	A		0	0	20	60	20

- a/ A. EAP faculty assessment of EAP graduates competency
 B. Employer assessment of EAP graduates competency
 C. EAP employer assessment of preferred competency level
 D. EAP employer assessment of future expectation
 E. Non-EAP employer assessment of future expectations

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were within the acceptable performance range. For six competencies, graduates' competence was below the level preferred by employers' and for all competencies the performance was below the future expectations of employers of EAP graduates. However, for five of the six competencies, non-EAP employers judged the future needs to be consistent with reported graduate performance when examining high-level performance competencies. A broader range of performance was still below expectations for future hires in four of the competencies when judged by EAP graduate employers. Non-EAP graduate employers would have found EAP graduates within acceptable range of performance in five of the six areas.

Half of the students were judged to be non-performers in the competency related to an understanding of policies that have an impact on markets. Graduates expressed a high level of satisfaction with their animal science, training and faculty judged them to perform well in most competency areas. It is possible that the kinds of specific competencies employers expected of graduates, and expect to find in future hires, do not quite match the competencies being emphasized in the EAP curriculum. The reader should note the competencies dealing with food processing and slaughtering have not been included in the narrative discussion since the assessment made by faculty of the curriculum divided the competency into areas for which there were no matching data.

4. Crop Production

Crop production competencies are among the most used of all of the curriculum areas. With the exception of storage and marketing, about half of the employers reported the crop production competencies to be used or needed (Tables XI-4a and 4b).

TABLE XI-4a. CROP PRODUCTION--SUMMARY OF GRADUATE PERFORMANCE:
COMPARISON OF EAP FACULTY, EAP EMPLOYERS AND OTHER EMPLOYERS

From Table XI-4b	EAP Employer Performance Assessment Versus						Faculty Assessment Versus Employer Preferred Performance			
	Own Preferred Performance B vs. C	Own Future Expectations B vs. D			Other Employer Future Expectations B vs. E			Faculty Performance Assessment B vs. A		Faculty Assessment Versus Employer Preferred Performance A vs. C
	High Levels <u>a/</u>	High Levels <u>b/</u>	All Levels <u>b/</u>	High Levels <u>a/</u>	All Levels <u>b/</u>	High Levels <u>a/</u>	All Levels <u>b/</u>	All Levels <u>b/</u>		
1. Identify the common parts of all plants and other crops common to the zone where he/she works.	o	o	o	o	o	o	o	o		
2. Select appropriate crop varieties considering maturity, harvestability, disease resistance, lodging resistance, insect resistance, and yield	-	-	o	o	o	-	o	o		
3. Know the essential requirements and steps in preparing a seed bed for crops grown for subsistence and market.	o	o	o	o	o	o	o	o		
4. Identify symptoms and causal agents of disease common to economically important crops. Describe the control measures of diseases common to economically important crops.	-	-	o	-	o	o	o	o		
5. Identify and describe insects that are beneficial and harmful to economically important crops. describe the cultural, chemical, and biological control programs for harmful insects.	-	-	o	o	o	-	o	o		
6. List the common cultural and chemical methods for weed control.	o	o	o	o	o	+	o	o		
7. Describe advantages and disadvantages of various methods of harvesting economically important crops.	-	-	o	-	o	o	o	o		
8. Plan a crop storage facility for crops stored for home use/livestock feed or for market.	-	-	-	o	o	-	o	o		
9. Describe the factors that regulate the market (supply and demand). Describe the factors that determine the price received by sellers throughout the marketing system.	-	-	o	o	o	o	o	o		

SUMMARY: Number of Competencies:

o Within acceptable range	3	3	8	7	9	5	9	9
+ At least 20% above	0	NA	0	NA	0	1	0	0
- At least 20% below	6	NA	1	NA	0	3	0	0
+ At least 30% above		0		0				
- At least 30% below		6		2				

a/ Includes ability to perform without supervision and ability to teach others

b/ Includes high level plus ability to perform with supervision

KEY: See Table XI-1a

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TABLE XI-4b. CROP PRODUCTION: FACULTY AND EMPLOYER ASSESSMENT OF COMPETENCIES

	Basis for Rating <u>a/</u>	Level of Graduate Performance					
		Percent Not Using the Skill or Competency	Did Not Observe or Study	Observed or Studied But Not Able to Perform	Perform with Super- vision	Perform without Super- vision	Able to Teach Others
-----percent-----							
1. Identify the common parts of all plants and other crops common to the zone where he/she works.	A	--	--	10	40	40	10
	B	48	5	13	21	50	10
	C	45	1	11	12	53	23
	D	45	1	7	16	39	37
	E	48	2	13	20	35	29
2. Select appropriate crop varieties considering maturity, harvestability, disease resistance, lodging resistance, insect resistance, and yield.	A	--	--	5	15	60	20
	B	55	4	11	35	46	4
	C	50	1	8	18	56	17
	D	50	1	5	10	43	41
	E	46	0	8	22	31	39
3. Know the essential requirements and steps in preparing a seed bed for crops grown for subsistence and market.	A	--	--	--	25	50	25
	B	52	1	18	23	41	19
	C	49	0	8	15	52	26
	D	49	0	5	11	38	46
	E	50	0	12	21	31	37
4. Identify symptoms and causal agents of disease common to economically important crops. Describe the control measures of diseases common to economically important crops.	A	--	--	10	40	40	10
	B	48	9	11	37	33	10
	C	45	1	5	19	52	24
	D	45	0	2	11	41	46
	E	44	0	3	18	40	39
5. Identify and describe insects that are beneficial and harmful to economically important crops. Describe the cultural, chemical, and biological control programs for harmful insects.	A	--	--	--	20	50	30
	B	49	4	15	30	38	12
	C	45	1	6	14	51	28
	D	45	0	3	12	37	49
	E	44	2	5	19	37	38
6. List the common cultural and chemical methods for weed control.	A	--	--	10	50	35	--
	B	49	3	12	26	42	17
	C	45	1	10	12	51	26
	D	45	0	5	9	40	46
	E	45	1	5	16	39	40
7. Describe advantages and disadvantages of various methods of harvesting economically important crops.	A	--	--	10	40	40	10
	B	57	4	19	35	36	5
	C	54	1	8	21	50	19
	D	53	1	5	13	49	32
	E	50	1	10	18	36	36
8. Plan a crop storage facility for crops stored for home use/livestock feed or for market.	A	--	--	15	35	40	10
	B	68	3	29	39	24	6
	C	66	0	9	25	47	19
	D	64	0	6	15	37	42
	E	56	1	18	24	31	26
9. Describe the factors that regulate the market (supply and demand). Describe the factors that determine the price received by sellers throughout the marketing system.	A	--	--	20	60	20	--
	B	62	8	23	32	32	5
	C	59	1	11	27	41	20
	D	59	1	11	16	33	38
	E	56	3	12	31	30	24

- a/ A. EAP faculty assessment of EAP graduates competency
 B. Employer assessment of EAP graduates competency
 C. EAP employer assessment of preferred competency level
 D. EAP employer assessment of future expectation
 E. Non-EAP employer assessment of future expectations

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When all levels of performance are considered, these competencies show a good match among the comparison groups. Thirty-five of the thirty-six comparisons are within the acceptable range of performance.

For the high-level performance categories, EAP faculty assessment of performance was in agreement with employers' assessment for five of the nine competencies, above performance in three and below in one. Actual performance is below the preferred level in six of the nine competencies and below the expected level of future hires as expressed by EAP graduate employers for six of the nine. However, actual performance is in agreement with expectations of non-EAP graduate employers in seven of the nine crop production competencies. This supports the general belief that the school has a very strong program in this field.

Of the competencies tested, graduates were judged to be non-performers most frequently in those dealing with storage and with marketing. However, these were areas that employers also had the lowest expectation for competence both for graduates hired in the past and those to be hired in the future.

Graduates expressed a high level of satisfaction with their crop production training both in general and in the mix between theory and practice. There were, however, indications that there could be more emphasis on theory which might relate to the need for some increased emphasis on storage principles and the theory of markets.

5. Economic Management and Marketing

Only about one-third of the graduates are expected to use the eight competencies cited in economic management and marketing. It is the one curriculum area where the EAP faculty estimated that half or fewer of the graduates would be able to per-

form the various competencies. Actual performance of graduates in the high-level performance area was judged to be above faculty expectations for three of the eight competencies and in the acceptable performance range for the remaining five (Tables XI-5a and 5b).

EAP graduate employers prefer a higher incidence of high-level performance in seven of the eight competencies cited and would expect future performance to be above past performance in the same seven competencies. When high performance level of competency was compared to future expectations of non-EAP graduate employers, the comparison fell within an acceptable range of performance in six of the eight competencies.

When all levels of performance were considered for this competency area, EAP faculty assessments fell below both the preferred level of performance and actual performance in all competencies. The high assessment by faculty of non-performance contributed to this consistent disparity. Performance was below future expectations for five of the seven competencies when judged against EAP graduate employer expectations, but within acceptable range in seven of eight competencies when judged against the expectations of other employers.

The performance expectations for this group of competencies is fairly high for those employers who expect the competencies to be used. Some questions should be raised about the economic management and marketing curriculum to determine if it is possible to improve upon the performance of students at the time of graduation. Particular attention may be focused on government policy knowledge, since this is the area where non-performance is judged to be highest.

TABLE XI-5a. ECONOMIC MANAGEMENT AND MARKETING--SUMMARY OF GRADUATE PERFORMANCE:
COMPARISON OF EAP FACULTY, EAP EMPLOYERS AND OTHER EMPLOYERS

From Table XI-5b	EAP Employer Performance Assessment Versus						Faculty Assessment Versus Employer Preferred Performance		
	Own Preferred Performance B vs. C		Own Future Expectations B vs. D		Other Employer Future Expectations B vs. E		Faculty Performance Assessment B vs. A		Faculty Assessment Versus Employer Preferred Performance A vs. C
	High Levels <u>a/</u>	High Levels <u>b/</u>	All Levels <u>b/</u>	High Levels <u>a/</u>	All Levels <u>b/</u>	High Levels <u>a/</u>	All Levels <u>b/</u>	All Levels <u>b/</u>	
1. Determine the marketing alternatives available for agricultural products that will secure the best price for sellers.	o	o	-	o	o	+	+	-	
2. Calculate expected returns and profits from individual enterprises and combinations of enterprises on farms of various sizes	-	-	-	-	o	o	+	-	
3. Compare and contrast individual, cooperative, and corporate marketing strategies and describe the potential advantages and disadvantages of each strategy.	-	-	-	o	o	o	o	-	
4. Identify sources of credit for agriculture and the most appropriate use of credit in the agricultural sector.	-	-	o	o	o	+	+	-	
5. Prepare a budget for a farm or related business.	-	-	-	o	o	o	+	-	
6. List steps to follow in managing the farm business to maximize returns to available sources.	-	-	o	-	o	+	+	-	
7. Describe government policies that affect the operation and maintenance of an agribusiness.	-	-	-	o	-	o	o	-	
8. Summarize and analyze the records of a farm or non-farm business to determine strengths and weaknesses of the business operation.	-	-	o	o	o	o	+	-	
9. Processing and analysis of biological and economical phenomena and interpretation of results to be used in the decision making process.									
10. Establishment of experimental design and ability to interpret statistical results.									

SUMMARY: Number of Competencies:

o Within acceptable range	1	1	3	6	7	5	2	0
+ At least 20% above	0	NA	0	NA	0	3	6	0
- At least 20% below	7	NA	5	NA	1	0	0	8
+ At least 30% above		0		0				
- At least 30% below		7		2				

a/ Includes ability to perform without supervision and ability to teach others

b/ Includes high level plus ability to perform with supervision

KEY: See Table XI-1a

TABLE XI-5b. ECONOMIC MANAGEMENT AND MARKETING: FACULTY AND EMPLOYER ASSESSMENT OF COMPETENCIES

	Basis for Rating ^{a/}	Level of Graduate Performance					Able to Teach Others
		Percent Not Using the Skill or Competency	Did Not Observe or Study	Observed or Studied But Not Able to Perform	Perform with Super- vision	Perform without Super- vision	
-----percent-----							
1. Determine the marketing alternatives available for agricultural products that will secure the best price for sellers.	A	--	0	80	20	0	0
	B	67	7	18	19	27	30
	C	68	1	10	27	48	11
	D	65	1	3	12	49	35
	E	59	1	8	33	36	22
2. Calculate expected returns and profits from individual enterprises and combinations of enterprises on farms of various sizes	A	--	0	50	30	20	0
	B	66	7	22	37	30	4
	C	65	0	4	24	50	22
	D	64	1	0	11	49	38
	E	68	0	10	12	41	36
3. Compare and contrast individual, cooperative, and corporate marketing strategies and describe the potential advantages and disadvantages of each strategy.	A	--	0	50	30	20	0
	B	68	13	19	40	26	3
	C	68	0	4	27	51	18
	D	67	3	5	9	50	32
	E	62	1	12	33	36	18
4. Identify sources of credit for agriculture and the most appropriate use of credit in the agricultural sector.	A	--	0	60	20	20	0
	B	66	11	13	33	40	3
	C	64	0	6	14	62	18
	D	64	1	4	9	46	41
	E	62	0	8	26	45	21
5. Prepare a budget for a farm or related business.	A	--	0	50	30	20	0
	B	63	6	20	36	34	4
	C	62	0	7	19	57	17
	D	61	1	5	13	48	33
	E	61	0	8	25	40	26
6. List steps to follow in managing the farm business to maximize returns to available sources.	A	--	0	60	30	10	0
	B	65	3	18	40	37	3
	C	63	0	10	12	56	22
	D	62	1	5	10	46	38
	E	58	0	--	22	43	27
7. Describe government policies that affect the operation and maintenance of an agribusiness.	A	--	0	50	30	20	0
	B	69	15	21	31	28	6
	C	68	1	8	22	51	17
	D	67	0	5	14	52	29
	E	61	3	10	28	41	19
8. Summarize and analyze the records of a farm or non-farm business to determine strengths and weaknesses of the business operation.	A	--	0	60	30	10	0
	B	62	6	13	37	37	7
	C	60	0	7	15	52	26
	D	60	0	1	9	44	46
	E	57	0	6	22	43	29
9. Processing and analysis of biological and economical phenomena and interpretation of results to be used in the decision making process.	A	--	0	0	5	70	25
	B	--	--	--	--	--	--
	C	--	--	--	--	--	--
	D	--	--	--	--	--	--
	E	--	--	--	--	--	--
10. Establishment of experimental design and ability to interpret statistical results.	A	--	0	0	15	70	15

- ^{a/} A. EAP faculty assessment of EAP graduates competency
 B. Employer assessment of EAP graduates competency
 C. EAP employer assessment of preferred competency level
 D. EAP employer assessment of future expectation
 E. Non-EAP employer assessment of future expectations

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6. Horticulture

Horticultural competencies are the least used of any of the program areas studied. As few as 9 percent of the graduates were expected to use competencies related to forestry, and about 25 percent or less were expected to use general horticultural competencies (Tables XI-6a and 6b).

Two of the competencies (numbers 2 and 7) in this set were judged not to be specifically included in the EAP curriculum, yet employers judged that graduates could perform the skills at a fairly high level. An explanation may be that these competencies may have a strong transfer of skills from similar competencies taught in the general crop production area.

In the high-level performance category, there were no competencies where EAP faculty assessment of performance matched employers' judgement of performance. Two competencies requiring rote memory by students were assessed by faculty to be above the performance level exhibited by students, while the other nine areas showed students to perform better than expected. For eight of the eleven competencies, student performance was below employer preferences. The high competency expectations of EAP graduate employers compared to other employers was again evident. Other employers assessed performance within the acceptable range in seven of eleven competencies, and EAP graduate employers assessed performance to be below other employers' expectations in four competencies.

On the question of performance versus non-performance, the horticultural competencies, not including harvest and storage, were generally within the acceptable performance range for all comparisons. For the forestry-related items and the harvest/storage horticulture competency, there was less agreement among

TABLE XI-6a. HORTICULTURE--SUMMARY OF GRADUATE PERFORMANCE:
COMPARISON OF EAP FACULTY, EAP EMPLOYERS AND OTHER EMPLOYERS

From Table XI-6b	EAP Employer Performance Assessment Versus						Faculty Assessment Versus Employer Preferred Performance		
	Own Preferred Performance B vs. C	Own Future Expectations B vs. D		Other Employer Future Expectations B vs. E		Faculty Performance Assessment B vs. A		Employer Preferred Performance A vs. C	
	High Levels <u>a/</u>	High Levels <u>b/</u>	All Levels <u>b/</u>	High Levels <u>a/</u>	All Levels <u>b/</u>	High Levels <u>a/</u>	All Levels <u>b/</u>	All Levels <u>b/</u>	
1. Identify the common parts of horticultural plants and list their major function.	o	o	o	o	o	-	o	o	
2. Select appropriate fruit, vegetable, and ornamental plants, based on maturity, harvestability, disease resistance, insect resistance, and yield for different environmental conditions.	-	-	o	o	o	+	+	-	
3. List the seedbed preparation and propagation requirements for fruits and vegetables common to that environment.	o	o	o	o	o	+	o	o	
4. Identify symptoms, names, and causal agent diseases common to fruits and vegetables in tropical America.	-	-	o	-	o	-	o	o	
5. Identify the insects that are beneficial and harmful to the economically important fruit, vegetable and ornamental crops.	-	-	o	-	o	+	o	o	
6. Describe the common cultural and chemical weed control methods in fruit, vegetable, and ornamental horticultural	-	-	o	-	o	+	o	o	
7. Describe the harvest and storage of horticulture crops for maintaining quality and maximizing yield.	-	-	-	-	-	+	+	-	
8. Identify tree species and characteristics suitable for culture in various areas of tropical America for commercial use.	-	-	-	o	o	+	-	o	
9. Describe nursery procedures for propagation of tree seedlings to be used in reforestation programs.	-	o	-	o	-	+	-	o	
10. Utilize methods for protection against forest fires, insects, diseases, and forest animals.	o	o	-	o	o	+	o	o	
11. Identify multiple use of forests and the effect on our environment of commercial, exotic, or native species common to tropical and sub-tropical America.	-	-	-	o	-	+	-	o	

SUMMARY: Number of Competencies:

o Within acceptable range	3	4	6	7	8	0	6	9
+ At least 20% above	0	NA	0	NA	0	9	2	0
- At least 20% below	8	NA	5	NA	3	2	3	2
+ At least 30% above		0		0				
- At least 30% below		7		185	4			

a/ Includes ability to perform without supervision and ability to teach others
b/ Includes high level plus ability to perform with supervision

TABLE XI-6b. HORTICULTURE: FACULTY AND EMPLOYER ASSESSMENT OF COMPETENCIES

	Basis for Rating ^{a/}	Level of Graduate Performance					Able to Teach Others
		Percent Not Using the Skill or Competency	Did Not Observe or Study	Observed or Studied But Not Able to Perform	Perform with Super- vision	Perform without Super- vision	
-----percent-----							
1. Identify the common parts of horticultural plants and list their major function.	A	--	0	0	0	85	15
	B	73	2	17	14	53	15
	C	72	3	8	15	50	24
	D	72	2	10	10	43	37
	E	65	0	19	10	38	32
2. Select appropriate fruit, vegetable, and ornamental plants, based on maturity, harvestability, disease resistance, insect resistance, and yield for different environmental conditions.	A	*	100	0	0	0	0
	B	76	2	13	38	38	9
	C	75	2	7	13	54	25
	D	74	2	3	12	48	34
	E	66	0	11	16	36	37
3. List the seedbed preparation and propagation requirements for fruits and vegetables common to that environment.	A	--	0	10	80	10	0
	B	76	4	15	25	38	19
	C	75	2	11	16	39	32
	D	74	0	9	16	33	43
	E	67	0	14	15	32	38
4. Identify symptoms, names, and causal agent diseases common to fruits and vegetables in tropical America.	A	--	0	0	0	60	40
	B	73	2	13	41	36	8
	C	72	0	8	19	45	27
	D	71	0	5	14	42	39
	E	64	0	4	14	40	42
5. Identify the insects that are beneficial and harmful to the economically important fruit, vegetable and ornamental crops.	A	--	0	25	50	25	0
	B	73	2	17	36	36	10
	C	72	0	11	23	39	27
	D	71	0	6	16	36	42
	E	64	0	3	14	40	43
6. Describe the common cultural and chemical weed control methods in fruit, vegetable, and ornamental horticultural	A	--	0	5	95	0	0
	B	74	2	19	35	33	11
	C	73	0	7	22	43	28
	D	72	0	5	13	42	40
	E	64	0	5	10	42	43
7. Describe the harvest and storage of horticulture crops for maintaining quality and maximizing yield.	A	*	90	0	10	0	0
	B	80	4	33	33	22	7
	C	77	0	16	24	38	22
	D	77	0	12	15	42	31
	E	68	0	14	17	32	36
8. Identify tree species and characteristics suitable for culture in various areas of tropical America for commercial use.	A	--	0	10	90	0	0
	B	90	10	24	29	23	14
	C	89	0	4	31	35	32
	D	88	0	4	23	35	38
	E	81	2	16	32	20	29
9. Describe nursery procedures for propagation of tree seedlings to be used in reforestation programs.	A	--	0	10	90	0	0
	B	91	19	19	24	24	14
	C	89	0	8	33	29	29
	D	89	0	8	28	36	28
	E	81	1	13	26	18	42
10. Utilize methods for protection against forest fires, insects, diseases, and forest animals.	A	--	0	10	90	0	0
	B	91	10	19	19	29	24
	C	89	0	8	21	29	42
	D	89	-	4	32	24	40
	E	81	0	12	26	26	36
11. Identify multiple use of forests and the effect on our environment of commercial, exotic, or native species common to tropical and subtropical America.	A	--	0	10	90	0	0
	B	91	20	30	15	25	10
	C	90	0	13	13	43	30
	D	89	0	8	25	33	33
	E	81	2	14	26	20	37

- ^{a/} A. EAP faculty assessment of EAP graduates competency
 B. Employer assessment of EAP graduates competency
 C. EAP employer assessment of preferred competency level
 D. EAP employer assessment of future expectation
 E. Non-EAP employer assessment of future expectations

* These competencies were not included in the curriculum at EAP 6/8451A

comparison groups. For seven of the eleven horticulture competencies, performance was below expectation when EAP employers compared actual performance with future expectations.

Because these competencies are little used by graduates in this study, the horticulture area could be considered as a specialized area of study open to students selected by counseling rather than required of all students. Allowing some students to specialize in the horticulture area may permit the attainment of a higher level of performance, more in line with the levels expected by employers.

7. Soils, Soil Fertility and Conservation

Employees expect from 33 percent to over 40 percent of the graduates to use competencies related to conservation of soil resources. EAP faculty assessment of graduate performance is very close to the performance reported by employers (Table XI-7a and XI-7b). On the high-level performance categories, faculty assessments and employer judgments were within the acceptable range of performance for five of the seven competencies. However, graduate performance was below the level preferred by employers in all seven competencies. Likewise, performance was below expected performance of future hires for five out of seven competencies when judged by EAP graduate employers. Other employers judged expected future needs to be within the acceptable performance range for six of the seven competencies.

When expanded to include all levels of performance, with one exception, all comparisons were within the acceptable performance range. Expectations for non-performance by future hires is higher in the soils grouping than in some of the other curriculum areas.

TABLE XI-7a. SOILS AND SOIL FERTILITY--SUMMARY OF GRADUATE PERFORMANCE:
COMPARISON OF EAP FACULTY, EAP EMPLOYERS AND OTHER EMPLOYERS

From Table XI-7b	EAP Employer Performance Assessment Versus						Faculty Assessment Versus Employer Preferred Performance	
	Own Preferred Performance B vs. C	Own Future Expectations B vs. D		Other Employer Future Expectations B vs. E		Faculty Performance Assessment B vs. A		Faculty Assessment Versus Employer Preferred Performance A vs. C
	High Levels <u>a/</u>	High Levels <u>b/</u>	All Levels <u>b/</u>	High Levels <u>a/</u>	All Levels <u>b/</u>	High Levels <u>a/</u>	All Levels <u>b/</u>	All Levels <u>b/</u>
1. Describe the physical features, degree of erosion, internal drainage, soil texture, and topography	-	-	o	o	o	o	o	o
2. Plan a land use program on the basis of capability classification that will maximize productivity and protect soil from erosion.	-	-	o	o	o	o	o	o
3. Test and interpret soil test results and make fertilizer recommendations based upon yield goals.	-	-	o	o	o	+	o	o
4. Recognize nutrient deficiency in soils through plant symptoms and know how to correct the problem.	-	-	o	-	o	-	o	o
5. Apply or recommend applications of various fertilizer materials at optimum time.	-	o	o	o	o	o	o	o
6. Describe the proper conservation practices with various land capability classes. Plan a crop rotation system.	-	-	-	o	o	o	o	o
7. Select tillage practices that maintain soil structure and reduce compaction and soil erosion.	-	-	-	o	o	o	o	o

SUMMARY: Number of Competencies:

o	Within acceptable range	0	1	5	6	7	5	7	7
+	At least 20% above	0	NA	0	NA	0	1	0	0
-	At least 20% below	7	NA	2	NA	0	1	0	0
+	At least 30% above		0		0				
-	At least 30% below		6		1				

a/ Includes ability to perform without supervision and ability to teach others

b/ Includes high level plus ability to perform with supervision

KEY: See Table XI-1a

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TABLE XI-7b. SOILS, SOIL FERTILITY AND CONSERVATION: FACULTY AND EMPLOYERS ASSESSMENT OF COMPETENCIES

	Basis for Rating <u>a/</u>	Level of Graduate Performance					Able to Teach Others
		Percent Not Using the Skill or Competency	Did Not Observe or Study	Observed or Studied But Not Able to Perform	Perform with Super- vision	Perform without Super- vision	
-----percent-----							
1. Describe the physical features, degree of erosion, internal drainage, soil texture, and topography	A	--	0	10	50	35	15
	B	60	2	16	38	34	10
	C	58	0	6	27	41	26
	D	58	0	1	15	44	40
	E	60	0	11	20	40	29
2. Plan a land use program on the basis of capability classification that will maximize productivity and protect soil from erosion.	A	--	0	5	40	40	15
	B	59	4	12	31	40	12
	C	58	0	6	20	45	28
	D	57	0	4	11	40	45
	E	60	0	9	19	37	34
3. Test and interpret soil test results and make fertilizer recommendations based upon yield goals.	A	--	0	20	60	20	0
	B	65	3	19	36	32	9
	C	63	1	13	22	40	24
	D	61	0	8	10	37	44
	E	61	0	8	28	32	32
4. Recognize nutrient deficiency in soils through plant symptoms and know how to correct the problem.	A	--	0	10	30	50	10
	B	59	2	14	47	31	6
	C	58	0	6	26	50	18
	D	57	0	4	14	39	44
	E	59	0	6	24	40	30
5. Apply or recommend applications of various fertilizer materials at optimum time.	A	--	0	0	30	60	10
	B	61	1	12	29	45	13
	C	59	0	3	13	58	26
	D	58	0	3	10	34	53
	E	58	1	3	15	39	41
6. Describe the proper conservation practices with various land capability classes. Plan a crop rotation system.	A	--	0	10	60	30	0
	B	67	5	19	27	34	14
	C	64	0	9	16	48	28
	D	64	0	5	7	46	42
	E	59	0	7	26	34	33
7. Select tillage practices that maintain soil structure and reduce compaction and soil erosion.	A	--	0	5	25	55	15
	B	66	5	18	22	34	20
	C	63	0	6	17	49	28
	D	63	0	4	8	40	48
	E	61	1	10	20	37	31

- a/ A. EAP faculty assessment of EAP graduates competency
 B. Employer assessment of EAP graduates competency
 C. EAP employer assessment of preferred competency level
 D. EAP employer assessment of future expectation
 E. Non-EAP employer assessment of future expectations

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Graduates of EAP have expressed fairly high levels of satisfaction with their training in soils but also characterized the instruction as too limited in practice compared to theory. With the increased emphasis on soil conservation and soil improvement and the relatively high levels of non-performance in these areas by past graduates, some revision of curriculum or practice may be in order, if the needs for forest management and reforestation in Central America are to be recognized and met.

8. Communication and Human Relations Competencies

This category of competencies is the most used of any of the eight areas of the curriculum studied since it applies to graduates in all kinds of employment situations. It is the only category for which there is no EAP assessment of graduate capability, since the competencies are not all necessarily deliberately taught as part of the curriculum but rather are assimilated through living and working at EAP. Likewise, some of the competencies are developed in the home environment, community, and school activity prior to enrollment at EAP.

The competencies can be roughly divided into two categories: human relations (competencies 3, 4, 5, 6, and 9) and communications (competencies 1, 3, 7, and 8) (Tables XI-8a and 8b).

For the human relations competencies, all of the comparisons made are within the acceptable performance range and 95 percent or more of the students are judged by employers to be able to perform the competency usually at a high level of performance, not requiring supervision.

Communication competencies are much weaker. Speaking skills are judged to be weaker than writing skills. This shows in competencies 1 and 8, which are primarily speaking skills, as compared to competencies 2 and 7, which involve writing be-

TABLE XI-8a. COMMUNICATIONS AND HUMAN RELATIONS-- SUMMARY OF GRADUATE PERFORMANCE:
COMPARISON OF EAP EMPLOYERS AND OTHER EMPLOYERS

From Table XI-8b	EAP Employer Performance Assessment Versus						Faculty Assessment Versus Employer Preferred Performance		
	Own Preferred Performance B vs. C		Own Future Expectations B vs. D		Other Employer Future Expectations B vs. E		Faculty Performance Assessment		All Levels b/
	High Levels a/	High Levels b/	All Levels b/	High Levels a/	All Levels b/	High Levels a/	All Levels b/		
1. Prepare and deliver effective oral presentations.	-	-	-	-	-	NA	NA	NA	
2. Write in a clear and concise manner that conveys the intended message.	-	-	-	o	o				
3. Meet people and discuss common interest topics.	-	o	o	o	o				
4. Work with others--respect the position of superiors as well as those in lower positions.	o	o	o	o	o				
5. Supervise others while maintaining congenial rapport.	o	o	o	o	o				
6. Listen attentively for content and context of the communication.	o	o	o	o	o				
7. Identify the responsibilities of a job and translate to a description.	-	-	o	-	o				
8. Use appropriate procedures and techniques of persuasion in sales and promotion.	-	-	-	-	-				
9. Respect the views and rights of others regardless of position.	o	o	o	o	o				

SUMMARY: Number of Competencies:

o Within acceptable range	4	5	6	6	7
+ At least 20% above	0	NA	0	NA	0
- At least 20% below	5	NA	.3	NA	2
+ At least 30% above		0		0	
- At least 30% below		4		3	

a/ Includes ability to perform without supervision and ability to teach others

b/ Includes high level plus ability to perform with supervision

KEY: See Table XI-1a
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TABLE XI-8b. COMMUNICATIONS AND HUMAN RELATIONS: EMPLOYER ASSESSMENT OF COMPETENCIES

	Basis for Rating <u>a/</u>	Level of Graduate Performance					Perform without Supervision	Perform with Supervision	Able to Teach Others
		Percent Not Using the Skill or Competency	Did Not Observe or Study	Observed or Studied But Not Able to Perform	Perform with Supervision	Perform without Supervision			
-----percent-----									
1. Prepare and deliver effective oral presentations.	A	--	--	--	--	--	--	--	
	B	46	14	15	28	37	7		
	C	43	3	6	12	60	20		
	D	41	0	2	7	48	43		
	E	40	0	3	14	50	32		
2. Write in a clear and concise manner that conveys the intended message.	A	--	--	--	--	--	--		
	B	39	9	13	24	43	11		
	C	37	1	6	13	60	20		
	D	37	0	1	8	54	38		
	E	36	0	4	14	56	26		
3. Meet people and discuss common interest topics.	A	--	--	--	--	--	--		
	B	38	4	14	14	58	10		
	C	35	1	2	8	70	19		
	D	35	0	0	5	60	35		
	E	37	0	1	8	59	33		
4. Work with others--respect the position of superiors as well as those in lower positions.	A	--	--	--	--	--	--		
	B	36	1	6	16	61	15		
	C	35	1	2	8	65	24		
	D	35	0	0	6	51	43		
	E	36	0	0	8	56	35		
5. Supervise others while maintaining congenial rapport.	A	--	--	--	--	--	--		
	B	39	3	10	17	58	13		
	C	36	1	3	11	65	19		
	D	36	0	1	8	51	41		
	E	37	0	1	10	59	29		
6. Listen attentively for content and context of the communication.	A	--	--	--	--	--	--		
	B	37	1	7	14	63	14		
	C	35	1	3	8	65	24		
	D	35	0	0	6	55	39		
	E	36	1	2	5	60	32		
7. Identify the responsibilities of a job and translate to a description.	A	--	--	--	--	--	--		
	B	44	11	6	32	43	8		
	C	42	1	5	14	61	20		
	D	41	0	0	5	53	42		
	E	39	0	1	11	60	27		
8. Use appropriate procedures and techniques of persuasion in sales and promotion.	A	--	--	--	--	--	--		
	B	65	16	21	26	32	5		
	C	62	1	10	11	58	20		
	D	60	0	5	10	43	42		
	E	47	0	5	22	38	34		
9. Respect the views and rights of others regardless of position.	A	--	--	--	--	--	--		
	B	37	4	8	16	60	13		
	C	36	1	2	10	63	24		
	D	35	0	0	5	52	43		
	E	36	2	1	5	59	34		

a/ A. EAP faculty assessment of EAP graduates competency
 B. Employer assessment of EAP graduates competency
 C. EAP employer assessment of preferred competency level
 D. EAP employer assessment of future expectation
 E. Non-EAP employer assessment of future expectations
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haviors. Since employer expectations in the communication area are high and the competencies are highly valued by employers, an assessment of the communication curriculum by school authorities appears warranted.

C. Performance Assessment Summary

The 63 competencies assessed in this study represent only a sampling of the skills, knowledge, and attitudes that could be expected to be taught in the EAP curriculum. They were carefully selected to represent a continuum of activity in each of the eight curriculum areas.

The assessment of competencies acquired by graduates as appraised by EAP faculty, the assessment of graduates' levels of performance as appraised by their employers, and judgments about the preferred and expected levels of competency needed of future graduates were all used to provide a qualitative assessment of the EAP curriculum. The assessment was designed and implemented to evaluate the future employment needs of business, industry, and public agencies in Latin America.

In general, the following conclusions can be drawn:

- o EAP graduates perform at a higher level of performance than anticipated by EAP faculty.
- o Employers would prefer the graduates to be even more competent, especially in the future. No attempt was made, however, to determine if employers were prepared to compensate graduates for attaining higher levels of skills.
- o The level of performance of EAP graduates is generally a good match with the expectations for competence expressed by employers not hiring EAP graduates, but falls below expectations of those who presently employ EAP graduates.

- o Some EAP faculty are better than others in assessing the level of performance at which their graduates are capable.

To be of most value to EAP, each competency must be examined individually. For some competencies, there may be a logical explanation of why there is great disparity in the performance ratings between comparisons presented in this study. For others there may be evidence that what is taught and the way it is taught needs to be modified to best meet the perceived needs of the workplace. In any case, examining each competency, its frequency of use, and the assessment provided by the various groups, will help EAP staff and administrators make appropriate adjustments in the EAP curriculum.

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APPENDICES

APPENDIX A

Methodology

Background Information

Survey Instruments

feasible. A territory so vast and a population of business, industry, and government so dispersed required unique procedures which were technically sound and as free as possible from bias. The methodology and procedures focused on three primary populations:

- o The graduates of EAP
- o Employers and potential employers of graduates of EAP
- o The school itself--its policies and its programs

The fourth population, other institutions, was of largely secondary interest to this study. Of the four focal points of the study, only three populations are well defined: the graduates of EAP, the school itself, and the other educational institutions. The third element, employers and potential employers, was an unknown in the study area.

Through a unique information gathering strategy, it was planned that all elements be logically and systematically sampled to obtain the information required. The methodology used outlines the step-by-step procedure for selecting the samples from the population of student graduates and the employers, both current and potential.

A. Procedures For Locating Graduates

In order to conduct the EAP study as planned, it was necessary to secure a current mailing address of each of the graduates. The procedures were adapted from a similar follow-up study conducted by Peterson and Rabideau in Minnesota 1/ where, in a sample of 484 graduates, current mailing addresses were located for 99 percent of the graduates with United States mail deliverable addresses. The brief questionnaire that was then sent to each graduate produced a response from 97.7 percent of those whose addresses were known.

Similar procedures were planned for the study of EAP graduates, but due to lack of communication, only a portion of the procedure was followed. EAP had a complete roster of graduates with addresses. However, it was determined after the initial mailing that many of the addresses were not current. With the help of EAP alumni chapter officers and country representatives, responses were obtained from over 200 of the graduates who were the target for the study, exceeding the goal set in the project design.

Construction of the instruments was guided by the instructions provided by Dillman in his book Mail and Telephone Surveys 2/ and followed the practices found to be useful in other questionnaire studies. The questionnaire mailed to graduates of EAP was kept very brief, asking only those questions considered essential to meet project objectives. A copy of the questionnaire follows as a part of this Appendix.

Employer questionnaire/interview schedules were organized to provide quantitative and qualitative information about employees. The quantitative information was straightforward, seeking information on current employment, projected employment, and perceptions of supply. The primary thrust, however, was on obtaining qualitative information on the competency of employees. The procedure for reporting to each competency was used successfully by Virta 3/ (1968) in obtaining competency assessments in the horticulture industry to differentiate the skill levels of various classifications of workers in the industry. Virta devised the five response categories used to describe the level of skill: does not perform; knowledgeable but able to perform only with supervision; can perform with limited supervision; perform without supervision; and perform without supervision well enough to train others. He found these descriptive measures of job performance to be easily understood by employers and appropriate ways to differentiate among employees with different levels of skill. His study was part of a long line of

competency studies, each using slightly different terminology by researchers such as Coster 4/, Gunderson 5/, Hartog 6/, Crawford 7/, and many others.

A comprehensive manpower supply and demand study was conducted by the Minnesota State Department of Education under the direction of William Howenhaus. In this study, a selected group of teachers of vocational agriculture from local high schools interviewed agribusiness firms in their local communities. The objective was to determine the number of employees in each firm that needed agricultural competencies and to project the number of employees to be employed in the near future (5-7 years). From these projections an estimate was made of the new employees needed. The study provided clues as to the kind of training programs needed to supply the manpower demands of the agricultural industry. The technique for gathering information from employers by interview was followed in the EAP study. 8/

B. Identifying And Surveying Graduates Of EAP

Central to this study were the identification and location of 2,142 students that had graduated since the school graduated the first class in 1946. Assistance was provided by the director of the school, who supplied a mailing list of over 1,300 graduates. In October, 1984 these graduates were mailed a graduate survey form a/ and cover letter from the director of EAP which solicited responses. All communication of the graduate survey was in Spanish.

Additionally, letters were sent to all Asociacion de Graduados de la Escuela Agricola Panamericana (AGEAP) chapter presidents soliciting their help to encourage responses from graduates. Initially, the response was slow.

a/ Copies of all referenced survey materials can be found at the end of this Appendix.

Experience, Incorporated coordinators of field studies attended the AGEAP convention in El Salvador in November and, with the assistance of the EAP Director and Dean, emphasized the importance of the study and requested Zamoranos to return their questionnaires and encourage others to cooperate in the study. A follow-up letter was sent to AGEAP country representatives, again soliciting their support for alumni response.

In an effort to reach graduates who had not responded to the initial questionnaire, a second letter and the survey instrument were mailed in December to over 500 graduates of the last eight years (1976-1983) from the nine targeted countries where interviews would be conducted. Graduates were requested to return the questionnaire to Experience, Incorporated headquarters in Minneapolis. Copies of all questionnaires were shared with the director of EAP. EAP alumni representatives assisted in the refinement of addresses for this mailing, compiled from graduates and summarized as follows:

<u>Country</u>	<u>EAP Graduates 1976-1983</u>
Honduras	188
Costa Rica	77
Guatemala	52
Colombia	59
Ecuador	52
Nicaragua	52
Panama	33
Belize	21
Dominican Republic	<u>17</u>
TOTAL	551

A goal of 200 respondents was established as a desirable sample. These respondents would provide the names and addresses of employers of EAP graduates needed for the interviews.

A third and final effort to have AGEAP representatives assist was made with a letter in February which solicited their help. Subsequently, the Experience, Incorporated survey team, conducting the interviews of employers, made personal calls and visits to graduates to assist in obtaining questionnaires from graduates until the goal of 200 was reached.

TABLE A-1. GRADUATE SURVEY REPOSSES

Country	1976-1983	Prior to 1976	Total
Belize	9	2	11
Bolivia	4	3	7
Brazil	0	1	1
Colombia	20	15	35
Costa Rica	35	19	54
Dominican Republic	8	6	14
Ecuador	16	5	21
El Salvador	0	0	8
Guatemala	16	13	29
Honduras	89	53	142
Mexico	2	3	5
Nicaragua	9	6	15
Panama	13	14	27
Venezuela	<u>2</u>	<u>3</u>	<u>5</u>
TOTAL	223	151	374

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It was felt that the most recent graduates would provide the best yardstick of the supply/demand match; consequently, the study concentrated on graduates of the last eight years (1976-1983).

C. Sampling Frame For Employers Of EAP Graduates
And Interviewing Procedures

From the responses of graduates, lists of names and locations of employers of EAP graduates were developed for each of the nine countries targeted for the manpower study.

The Spanish language survey instrument designed to gather information from employers was field tested during November in El Salvador and Honduras. EAP board members and EAP alumni representatives contributed to the editing and refinement of the instrument. It was again field tested in Honduras during December at the time of the survey team's training.

Selection of the interview team was made from 1984 EAP graduates from the nine countries where interviews would be conducted. Their training, conducted entirely in Spanish occurred at Zamorano during the week following graduation. Sixteen team members were trained to conduct interviews of employers and to gather opinions from EAP graduates.

Initially, individuals conducting interviews were assigned names and addresses of employers who employed Zamoranos. As graduate survey responses dwindled, interviewers assisted in increasing the number of surveys returned by personally contacting Zamoranos in their country and assigning themselves to making the call to employers to conduct the interviews, until a total of 223 interviews had been conducted.

D. Rationale For Sampling Procedure

The extremely large population of businesses from which the employer information was to be drawn called for innovative sampling techniques that were based in part on random selection, but simple enough to be done in the field at relatively low

cost. The key selection criterion was the elimination of researcher bias in the selection of the businesses to be sampled. The procedures used are outlined in this methodology section. The rationale for the system is as follows.

The sample of businesses employing EAP graduates was purposeful. Only businesses which employed graduates of EAP as reported by the graduates themselves were included in the interview sample. Not all graduates responded to the initial questionnaire to identify their employer. Certainly those businesses that do employ EAP graduates do not represent the norm of all businesses in the study areas. They represent only the range of businesses that have in the past employed EAP graduates.

The businesses that were not known to employ EAP graduates were sampled using a random process done in two stages. The area from which the businesses were drawn was in a sense random, since they were drawn from the same city in which an EAP graduate was employed. Since the EAP graduate responded at random to the original survey, it can be assumed that the cities in which their employers resided represented a random selection from among all of the cities in which EAP graduates were employed.

The first stage random sampling involved selecting one of six types of businesses. The selection was made by a roll of a six-sided die, a completely random process.

Selecting the specific business from among the many businesses represented by the type of business was also done by random process. After numbering the businesses in a directory the die was again rolled to pick a specific business for interview. Rolling a die is a confirmed method of making a random selection.

The method of compiling the lists of businesses from which the sample was drawn insured that only those businesses that were large enough to have a telephone would be included, thus eliminating smaller businesses which did not have telephone service. The rationale for these exclusions was that they were unlikely candidates to employ persons with technical training in agriculture and thus would add little to the knowledge sought about current or projected manpower needs for persons with agricultural skills.

E. Sampling Procedures For Identifying
Potential Employers of Agricultural Graduates

To expand upon the demand side market analysis, it was necessary to sample a select group of firms which are potential employers of EAP graduates or graduates of other agricultural institutions. Because the location of the EAP graduates was not known, the sampling of potential employers was based upon some important assumptions:

- o Graduates generally return to their country of origin. Since EAP graduates come originally from all of the countries included in this study, it was felt that identifying the employment site of graduates should provide a reasonable distribution of sites throughout tropical America where employment opportunities exist.

- o If a production business, industry, firm, or government agency that employs a graduate of EAP exists in a specific country and city, it was assumed that there were other production businesses, industries, firms, or government agencies in that country and city that were of sufficient size to be potential employers of EAP graduates.

- o Within the country and city, the agricultural production businesses, industries, firms, or government agencies were aggregated geographically to permit a simple on-site sampling plan to provide data on two additional potential employers.

Based upon these assumptions, the following procedure was used for identifying potential employers. It was important that information from employers, both current and potential, be collected by personal interview. The steps utilized required that the interviewers make some sampling decisions on-site, according to the following procedures.

First, the type of business operated by the employer of the EAP graduate in the country and city was identified. This identification of business was recorded on a sampling card.

Next, an ordinary gaming die was rolled and the number was identified that corresponded to one of the six remaining types of employing businesses or agencies. This choice was then recorded. The die was then rolled a second time and the type of business was recorded. Enumerators then had the two types of businesses from which the potential employer sample was drawn. Listed below is the sampling card which shows the types of businesses/agencies categorized in this study.

SAMPLING CARD

Cross out the type of business operated by the graduate's employer. Number the remaining types of business from 1-6. Roll die to determine selection of two random businesses.

	Number
Agricultural Production	_____
Agricultural Processing	_____
Marketing and Distribution	_____
Agricultural Supplies and Service	_____
Credit	_____
Education	_____
Government Agency	_____
Business types selected by roll of the die:	

Next, using local telephone and other agribusiness directories available, enumerators compiled a list of the businesses in that country and city that fit into the type of business identified by the roll of the die. However, it never exceeded 48 names of businesses. When compiled, the list was then numbered starting with a number equal to the number of names on the list divided by six, with the answer raised to the next highest number in case of a fraction.

The individual businesses to be sampled were then selected by repeated rolls of the die. The number of rolls of the die was equal to the lowest number assigned to a business on the list, and this process was repeated for the second type of business identified by the roll of the die.

Enumerators on the study team used this procedure in interviewing 444 potential employers of EAP graduates.

F. Sampling of EAP Graduates

While conducting the employer interviews, the enumerators also contacted graduates of EAP to obtain their opinion of alternative programs that the college might consider for the future. This opinionnaire is presented in Appendix pp. A-25-26. These interviews focused on obtaining opinions from employees without regard to date of graduation, although an effort was made to obtain opinions from the most senior graduates at each place of employment.

Table A-2 identifies the number of employer and graduate interviews that were conducted.

G. Evaluation of EAP

The evaluation of EAP concentrated on specific competencies essential for current and future graduates. The professors at EAP were asked to identify the competencies taught in each course. Independent assessments were then made by the on-site evaluator who reviewed the course outline to validate the instructors' responses.

TABLE A-2. EMPLOYER AND GRADUATE INTERVIEWS BY COUNTRY

Country	Zamorano Employers	Non Zamorano Employers	Graduates	
			1976-1983	Prior to 1976
Honduras	91	188	77	37
Costa Rica	43	86	31	13
Ecuador	28	56	23	8
Colombia	20	38	20	3
Guatemala	12	26	7	5
Dominican Republic	10	21	4	6
Panama	11	16	--	--
Belize	7	13	7	--
Nicaragua <u>a/</u>	--	--	<u>1</u>	<u>--</u>
TOTAL	222	444	170	72

a/ Although graduates from Nicaragua responded to the mail questionnaire, it was not possible for the enumerators to conduct interviews with employers in the country due to political restrictions.

To assess the level at which each competency was taught, a questionnaire was prepared for the instructor to determine the level of competence which he/she perceived the student had attained. These levels of competence were identified on the following scale beginning with "No Level of Competence" and progressing to "Have Observed or Studied," "Can Perform with Supervision," "Can Perform without Supervision," and finally, "Can Perform Well Enough to Instruct or Support Others."

Responses were then compared to those of employers who responded with their perceptions of competency levels of graduates of EAP working for their business or agency. Such an assessment is an initial step in communicating the quality of the graduate and the perceived needs by agriculture/agribusinesses now and in the future. It should be pointed out that limitations exist in describing the results of such an assessment because most

employers were not familiar with competency statements and, more important, institutions of higher education seldom if ever perceive themselves to be in the business of teaching to specific competencies. At best, they prescribe a broad, general academic curriculum with little or no emphasis on specific competencies such as those identified for EAP. This institution is a rare exception in that it combines both a quality academic program and numerous hours and credits of hands-on, vocational education. But it remains, nonetheless, an institution of higher education in agriculture.

8486A

ESCUELA AGRICOLA PANAMERICANA: NUMBER OF GRADUATES BY YEAR AND COUNTRY

Country	Years																			Total	
	46-64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82		83
1 Honduras	200	5	11	14	16	17	20	13	16	10	15	17	14	34	33	24	20	17	14	32	542
2 Costa Rica	116	11	9	9	9	8	11	7	13	10	8	9	19	11	9	6	6	9	9	8	297
3 Guatemala	88	6	6	8	5	6	4	3	4	4	6	4	6	5	7	6	6	6	6	10	196
4 Colombia	80	4	4	6	6	5	3	4	2	6	10	8	6	7	7	5	8	8	11	7	197
5 Ecuador	58	5	4	3	6	4	4	6	7	6	6	5	6	5	7	4	8	4	6	12	166
6 Nicaragua	85	3	3	3	1	2	3	2	1	3	3	5	7	6	5	8	4	5	4	13	166
7 El Salvador	105	6	2	5	4	3														4	129
8 Panama	66	6	4	2	1	2	3	3	3		2	1	2	6	4	2	2	5	5	7	126
9 Rep. Dominicana	21	4	4	4	4	5	7	9	8	9	10	3		1		3	5	2	2	4	105
10 Mexico	13	1				1	2	5	2	2	1	3		2	1	2	1	2		1	39
11 Belize	4	3	1		1	1	1	1	1	3	4	2	1	4	5	1	2	1	3	4	43
12 Peru	21	4	1	2								1				4	1	1	1		36
13 Venezuela	3										1	1	1	20				1			27
14 Bolivia	10			1	2	1	1	1		1		3		2	3	5	5	2	4	2	43
15 Cuba	20																				20
16 Chile	6	1																			7
17 Argentina								1													1
18 Brazil																					1
19 Uruguay																					1
Totals	896	59	49	57	55	55	59	55	57	54	66	62	62	103	81	70	70	63	65	104	2142

SOURCE: Escuela Agricola Panamericana Annual Report, 1983



ZAMORANO - Aprender Haciendo

escuela
agrícola
panamericana

P.O. BOX 93 TEGUCIGALPA, HONDURAS

33-31 73 y 33-27 17 (Zamorano)
Telefonos: 32-85 43 y 32-43 17 (Tegucigalpa)

Estimado Colega Zamorano:

Con mucho placer hemos visto el desarrollo de tu carrera y confiamos que estés tan orgulloso de tus éxitos como nosotros lo estamos de tí en tu Escuela.

Para hacer del Zamorano una institución aún mejor necesitamos de tu valiosa ayuda. Como graduado sin duda tienes mejores ideas que muchos expertos de como modificar los programas educativos de tu Escuela para hacerlos mejores y más relevantes a las realidades actuales, a los futuros graduados y a los futuros empleadores. Sabemos que el Zamorano ganará mucho con tus ideas y evaluación y por eso es necesario que completes el cuestionario adjunto y nos lo devuelvas en el sobre que se adjunta.

Estamos pidiendo información sobre tu educación y empleos que has tenido. También necesitamos conocer las ideas de tu jefe actual en relación con las modificaciones y sugerencias del programa de entrenamiento y el curriculum de la Escuela. Estas ideas contribuirán a hacer que sus graduados salgan mejor preparados para enfrentarse con los retos del futuro. Necesitamos que autorices que entrevistemos a tu jefe marcando la casilla apropiada.

Tambien necesitamos tu opinión y tu sentir sobre el tipo de educación que recibiste en El Zamorano. Examina cada punto con cuidado y da tu opinión franca y honesta.

Además es muy importante que nos envíes el nombre y la dirección de colegas Zamoranos que no han recibido este cuestionario. Para beneficio de este estudio y de tu Alma Mater necesitamos respuestas a estas preguntas de la mayoría de graduados; si alguien no recibió una copia tal vez le puedes proporcionar una copia de tu cuestionario.

Finalmente, se ha dejado espacio suficiente para que nos des tu opinión sobre cualquier aspecto que pueda mejorar el programa de estudios del Zamorano. Cualquier comentario constructivo será de gran valor para hacer de la Escuela una institución aún mejor.

¡El tiempo es oro!. Sin embargo, con unos pocos minutos de tu tiempo puedes contribuir a tu Alma Mater algo que todo el oro del mundo no puede comprar, y esto es tu dedicación, tus valiosas ideas y tu deseo de contribuir al proyecto más valioso del hemisferio: ¡APRENDER-HACIENDO!

Confíalmente,

Simón E. Malo
Director

Adjunto

ATENCIÓN: POR FAVOR COMPLETE
Y MANDE A VUELTA DE CORREO
LO MAS PRONTO POSIBLE

Nombre _____
Dirección Postal _____
Ciudad _____ País _____
Teléfono oficina _____ Res. _____

Estudio de Seguimiento: Egresados de la Escuela Agrícola
Panamericana El Zamorano, Honduras

Favor de contestar las siguientes preguntas:

1. ¿ En que año egresó de la EAP? _____
2. ¿Cuál es su ocupación actual? _____
3. Educación recibida después de su graduación de la EAP:
Describe todos los cursos, seminarios, talleres, y grados obtenidos.

Por Favor, Dénos el Nombre de Institución y Dirección	Fecha y Año	Duración de la actividad en Semanas	Tipo de curso o programa de estudio	Tipo de Certificado, diploma, etc
-------------------------------------------------------------	-------------------	-------------------------------------------	-------------------------------------------	--------------------------------------

a. Estudios
Universitarios _____

b. Estudios de
Postgrado _____

c. Cursos de
Adiestramiento _____

4. Experiencias de Trabajo después de graduación.
Indique las diferentes instituciones con las cuáles ha trabajado,
recientemente, si ha permanecido en ella por más de un mes.

Institución _____	Dirección _____
Fecha de Ingreso _____	Teléfono _____
Fecha de Egreso _____	Título _____

Describe sus funciones y personal a su cargo:

Institución _____ Dirección _____

Teléfono _____
Fecha de Ingreso _____ Título _____
Fecha de Egreso _____

Describa sus funciones y personal a su cargo:

Institución _____ Dirección _____

Teléfono _____
Fecha de Ingreso _____ Título _____
Fecha de Egreso _____

Describa sus funciones y personal a su cargo:

5a. Deseamos entrevistar a patrones de egresados del Zamorano.

Favor de indicar el nombre y dirección completa de su patrón

5b. ¿Es Usted propietario?

SÍ

No

¿Estaría Usted de acuerdo, que un miembro del grupo de este estudio, lo visite?

SÍ

No

6. Utilizando esta escala ¿Como calificaría Usted los estudios de ciencias básicas en el Zamorano?

1	2	3	4	5
insuficiente	suficiente	bueno	muy bueno	excelente

7. Conteste las siguientes preguntas con uno ú otro de los dos (a) ó (b)

a. Si obtuvo un grado Universitario. ¿Tuvo que obtenerlo porque sus oportunidades de hallar trabajo fueron limitadas?

Sí, describa _____

No

b. Si no obtuvo un grado Universitario. ¿Crée Usted, que en relación a su preparación, la falta del título universitario ha puesto límites en su carrera profesional?

No

Sí, describa _____

8. Suponiendo que tuviera la oportunidad de obtener un grado universitario, ¿Dónde preferiría obtenerlo?

a. en el Zamorano _____

b. en otra parte _____

9. Evaluación del Programa Educativo de EAP.

Utilizando la escala que sigue para los ocho (8) programas de estudio que se realizan en la Escuela, indique su opinión del valor de cada área con relación a:

(1) su primer trabajo después de graduación

(2) a su trabajo actual. (Marque su opinión con un círculo)

Por favor véa instrucciones abajo para el uso de la escala.

Area De Estudio	(1) Primer Empleo						(2) Empleo Actual															
1. Suelos, fertilidad de suelos y conservación	A	0	1	2	3	4	A	0	1	2	3	4	B		1	2	3	B		1	2	3
2. Producción agronómica	A	0	1	2	3	4	A	0	1	2	3	4	B		1	2	3	B		1	2	3
3. Producción Hortícola	A	0	1	2	3	4	A	0	1	2	3	4	B		1	2	3	B		1	2	3
4. Zootecnia	A	0	1	2	3	4	A	0	1	2	3	4	B		1	2	3	B		1	2	3
5. Maquinaria Agrícola	A	0	1	2	3	4	A	0	1	2	3	4	B		1	2	3	B		1	2	3
6. Economía Agrícola, Contabilidad, Mercadeo	A	0	1	2	3	4	A	0	1	2	3	4	B		1	2	3	B		1	2	3
7. Administración de Negocios Agro-Industriales	A	0	1	2	3	4	A	0	1	2	3	4	B		1	2	3	B		1	2	3
8. Comunicación y relaciones humanas	A	0	1	2	3	4	A	0	1	2	3	4	B		1	2	3	B		1	2	3

Instrucciones:

Escala A

Escala B

- 0 = si no lo requiere o no es usado
- 1 = si ha usado la información pero cree que su preparación fué muy, insatisfactoria
- 2 = Si ha usado la información y cree que su preparación fué insatisfactoria
- 3 = Si ha usado la información y cree que su preparación fue satisfactoria
- 4 = Si ha usado la información y cree que su preparación fué muy satisfactoria

- 1 = Mucha teoría y muy poca práctica
- 2 = buena combinación de teoría & práctica
- 3 = muy poca teoría y mucha práctica

10. Podría Usted indicar lo que estima que han sido los aspectos mas beneficiosos en su educación en el Zamorano. Comente en cuáles áreas cree Usted que se puede mejorar o fortalecer el programa o la vida estudiantil.

1. Programa de estudios

Beneficios -

Deficiencias

2. Vida estudiantil

Beneficios -

Deficiencias

3. Otros comentarios -

ATTENTION: PLEASE COMPLETE AND
RETURN AS SOON AS POSSIBLE

Name _____

Address _____

Country _____

Telephone-Office _____ Home _____

Graduate Survey Project: Graduates of the Panamerican Agricultural School
El Zamorano, Honduras.

Please answer the following questions:

1. What year did you graduate from EAP? _____
2. Present occupation? _____

3. Further studies after graduating from EAP?
Describe all seminars, workshops and degrees obtained.

Name and address of school	Month and Year	Course Duration in Weeks	Type of Course or Program	Certificate or Diploma
a. University Studies				
b. Postgraduate Studies				
c. Specialized Training				

4. Work experience after graduation.
List any work experience, starting with the most recent, if worked over a month.

Company _____ Address _____

Telephone _____
Started _____ Title _____
Resigned _____

Job description and duties. Personnel under your supervision: _____

Company _____ Address _____

Telephone _____
Started _____ Title _____
Resigned _____

Job description and duties. Personnel under your supervision: _____

Company _____ Address _____

Telephone _____
Started _____ Title _____
Resigned _____

Job description and duties. Personnel under your supervision: _____

5a. We wish to interview present employers of former Zamorano students:
Please indicate your present employer's name and address

5b. If you own your own business please mark the box with an X
Would you object to a visit from a member of our survey team?

Yes No

6. Using this scale how would you rate the basic science studies?

1 2 3 4 5
Below Average Average Good Very Good Excellent

7. Answer the following questions. Choose A or B

a. Do you have a university degree? Did you have to get a university degree due to the limited opportunities in the work field?

Yes, please describe _____

No

b. If you do not have a university degree: Do you believe that in relation to your preparation the lack of the university title has limited your professional career path

No

Yes, please describe _____

8. If you had the opportunity to get a university degree, where would you like to obtain this degree?

a. Zamorano _____

b. Other _____

9. EAP Study Program Evaluation

Using the following scale please rate the eight (8) programs of study offered at the school. Give your opinion in each area in relation to:
 (1) Your first job after graduation. (2) Your present job (please circle your choice).

See please instructions below for use of the scales

Study Program	First Job	Second Job
1. Soils, Soil Fertility and Conservation	A 0 1 2 3 4 B 1 2 3	A 0 1 2 3 4 B 1 2 3
2. Field Crop Production	A 0 1 2 3 4 B 1 2 3	A 0 1 2 3 4 B 1 2 3
3. Horticultural Production	A 0 1 2 3 4 B 1 2 3	A 0 1 2 3 4 B 1 2 3
4. Animal Science	A 0 1 2 3 4 B 1 2 3	A 0 1 2 3 4 B 1 2 3
5. Agricultural Machinery	A 0 1 2 3 4 B 1 2 3	A 0 1 2 3 4 B 1 2 3
6. Agricultural Economy, Bookkeeping, Marketing	A 0 1 2 3 4 B 1 2 3 4	A 0 1 2 3 4 B 1 2 3
7. Business Administration Agro-Industries	A 0 1 2 3 4 B 1 2 3	A 0 1 2 3 4 B 1 2 3
8. Communications and Human Relations	A 0 1 2 3 4 B 1 2 3	A 0 1 2 3 4 B 1 2 3

Instructions: Scale A

Scale B

0 not required or not used

1. Used the information but believe instruction was very unsatisfactory.

2. Used the information but believe instruction was unsatisfactory.

3. Used the information and believe instruction was satisfactory

1. Too much theory and not enough practice.

2. Good combination of theory and practice

3. Not enough theory and too much practice

10. Please indicate, in your opinion, what have been the most important aspects of your education at Zamorano. What areas of the study program, or campus life could use either strengthening or improvement?

1. Study Program

Advantages _____

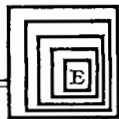
Deficiencies _____

2. Campus Life

Advantages _____

Deficiencies _____

3. Other Comments



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2000 DAIN TOWER MINNEAPOLIS, MN 55402 U.S.A. (612) 371-7990

CABLE: EXPERIENCE

TELEX: 467326 EXPERIENCE CI

The Board of Directors of Escuela Agricola Panamericana has requested our services to direct a study that will determine the agricultural manpower needs in Tropical America where Zamoranos are employed. The general objective of the study is to identify the most useful niche for EAP in the agricultural education needs of nine countries with the largest number of graduates.

Our first effort is to locate as many graduates as we are able in order that we may obtain their opinions about their training at Zamorano and to determine their present employment. The initial mailing has been made to 1,300 graduates from whom we will collect this information

Subsequently, we will be conducting a personal interview with agriculture/agribusiness employers who will respond to the contributions that EAP has made in preparing students for employment. Furthermore, we will be conducting a survey of employers who have not employed Zamoranos.

We hope to have the mail questionnaire to the graduates returned within a month. A follow-up will be made at the Zamorano International Convention in San Salvador in an effort to complete the survey of every Zamorano graduate.

Through your contact with Zamoranos you can encourage them to return the questionnaire at the earliest convenience, and you can provide addresses for those whom we will identify in a future mailing with unknown addresses.

[FOLLOWING PARAGRAPH INCLUDED IN LETTER TO NINE COUNTRIES]

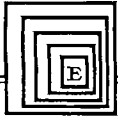
Secondly, you can be of great help to us if you can supply us with directories that provide names, addresses, and telephone numbers of potential employers of Zamoranos. These lists will be used in selections of employers for interviews when we conduct the manpower survey. Seven categories of agriculture/agribusiness are identified on the enclosed sheet. Would you please review these categories and send the directories from these categories by air mail to us as soon as possible?

Hopefully we will be able to meet you at the International Convention in San Salvador.

Sincerely,

Lee D. Sandager/I. Miley Gonzalez
Project Coordinators

cc: Simon Malo
William Bursch



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2000 DAIN TOWER MINNEAPOLIS, MN 55402 U.S.A. (612) 371-7990

CABLE: EXPERIENCE

TELEX: 467326 EXPERIENCE CI

This letter follows our letter of November 19 which requested your assistance in having Zamoranos complete and mail the survey questionnaire to EAP. We thank you for your contributions in assisting this important response from graduates since 1976.

We are also attempting to obtain addresses for Zamoranos not known to the school. Could you and your alumni further assist this study by supplying us with addresses for any graduates on the enclosed list and mail them to:

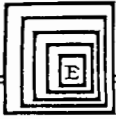
Experience, Incorporated
1930 Dain Tower
Minneapolis, Minnesota 55402 USA

If you have not already sent directories of crop and livestock producers to EAP, we would appreciate your sending these directories to the above address also.

Sincerely,

Lee D. Sandager/I. Miley Gonzalez
Project Coordinators

cc: Simon Malo
John Smith
Mario Nufio
William Bursch



EXPERIENCE, INCORPORATED

EXPERIENCE® - Agribusiness / Agriculture Worldwide

1930 DAIN TOWER MINNEAPOLIS, MN 55402 U.S.A. (612)333-5231

CABLE: EXPERIENCE

TELEX: 467326 EXPERIENCE CI

Diciembre 17, 1984

Estimado Zamorano:

Por medio de la presente le saludamos y esperamos que esté gozando estos días festivos.

En octubre de este año, se le envió una carta de parte del Dr. Simón Malo, Director de la Escuela Agrícola Panamericana, en la cuál se pedía que usted completara y remitiera una encuesta con el fin de llevar a cabo el estudio respecto a la EAP y a las necesidades de recursos humanos en la América Latina.

Es posible que la carta no le haya llegado a la dirección que se usó; así que aprovechamos de esta Pascua navideña para comunicarnos con usted otra vez.

Si todavía no ha completado la encuesta, rogamos que usted tome unos pocos minutos para hacerlo. Por favor remítala directamente, por correo aéreo a la dirección siguiente:

Experience, Incorporated
1930 Dain Tower
Minneapolis MN 55402 USA

Nos urge recibir la encuesta inmediatamente con el fin de poder empezar con la próxima fase de este proyecto muy importante para su "alma mater."

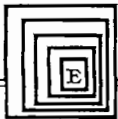
Feliz Navidad y Próspero Año Nuevo.

Atentamente,

Lee D. Sandager y Miley Gonzalez
Coordinadores de Proyecto EAP

/llz
1684

adj.



EXPERIENCE, INCORPORATED

EXPERIENCE® - Agribusiness / Agriculture Worldwide

2000 DAIN TOWER MINNEAPOLIS, MN 55402 U.S.A. (612) 371-7990

CABLE: EXPERIENCE

TELEX: 467326 EXPERIENCE CI

December 17, 1984

Dear Zamorano :

In his letter of October, 1984 Dr. Simon Malo, Director of EAP, requested you filled out and return the graduate survey for the study of Human Resources in Latin America that we are conducting for the school.

Perhaps you did not receive the letter.

If you have not yet completed the survey please do so as soon as possible and send it directly to the following address:

Experience, Incorporated
1930 Dain Tower
Minneapolis, MN 55402 USA

It is urgent that we receive the completed questionnaire so we can start with the second phase of the project, of great importance to your "alma mater"

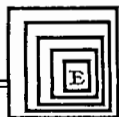
We take this opportunity to wish you a Merry Christmas and prosperous New Year.

Sincerely,

Lee D. Sandager/Miley Gonzalez
EAP Project Coordinators

/llz
1684

Encl.



EXPERIENCE, INCORPORATED

EXPERIENCE® - Agribusiness / Agriculture Worldwide

2000 DAIN TOWER MINNEAPOLIS, MN 55402 U.S.A. (612) 371-7990

CABLE: EXPERIENCE

TELEX: 467326 EXPERIENCE CI

To date we have received [number] questionnaires returned from [country] that will assist in our study of Tropical Agricultural Manpower. We anticipate more are in the mail.

Especially important to our study at this time is the return of the mail questionnaire from Zamoranos who graduated during the past eight years.

Enclosed is a list of the Zamoranos graduating since 1976 that we have not yet heard from. Would you please help us by having them complete the questionnaire and sending it directly to this address:

Experience, Incorporated
1930 Dain Tower
Minneapolis, Minnesota 55402 USA

We appreciate all your efforts to contribute to the future of EAP.

Sincerely,

Lee D. Sandager/I. Miley Gonzalez
Project Coordinators

INTERVIEW NUMBER 1
EMPLOYER OF ZAMORANO

Preliminary Information:

Date _____ Country _____ Seal _____
 Name of Interviewer _____
 Person Interviewed _____
 Name of Business _____ Signature _____
 Address _____

- Bus.Code 1. Type of Business (mark with a circle)
- | | | |
|--------|--------------------------------|---------------------------------------|
| 1.0() | 1.1 Agricultural Production | 1.2 Agricultural Processing |
| | 1.3 Marketing and Distribution | 1.4 Agricultural Supplies and Service |
| | 1.5 Finance and Credit | 1.6 Education |
| | | 1.7 Governmental Agency |

2. Name of person and title of position: _____

If you are that person, describe your own job and duties.

Job Code 3. In order to gain some sense of the need for manpower trained in
 2.1 () agriculture, please give your best estimate of the total number of people
 you now employ or think you will employ in the future to either improve
 the quality of your work force or expand your business or agency. You will
 have to give your best realistic estimate in each category. If you are
 self-employed, be sure to count yourself.

- 3.1 Total Number of Employees in the Business - All Types (3.11) _____
- | | | |
|-------------------------------|--------|-------|
| Number of full-time employees | (3.12) | _____ |
| Number of part-time employees | (3.13) | _____ |

3.2 Assessment of supply and demand for agricultural employees

Academic Training of the Employee	Current Employees	Employees Required in the Future
(3.21) Completed primary school	(3.211) Number _____	(3.222) Number _____
(3.22) Secondary Agriculture School Graduate	(3.221) Number _____	(3.222) The supply will be Inadequate _____(1) Adequate _____(2) Surplus _____(3)

<p>(3.23) Persons who have two years of post-secondary agricultural study.</p>	<p>(3.231) Number _____ Institutions from which you hired most of your graduates. 1. _____ 2. _____ 3. _____</p>	<p>(3.232) Number _____ The supply will be Adequate _____(1) Inadequate _____(2) Surplus _____(3)</p>
<p>(3.24) Persons who have a bachelor's degree in an agricultural field.</p>	<p>(3.241) Number _____ Institutions from which you hired most of your graduates. 1. _____ 2. _____ 3. _____</p>	<p>(3.242) Number _____ The supply will be Adequate _____(1) Inadequate _____(2) Surplus _____(3)</p>
<p>(3.25) Advanced professionals who have a master's or a doctorate in an agricultural discipline.</p>	<p>(3.251) Number _____ Institutions from which you hired most of your graduates. 1. _____ 2. _____ 3. _____</p>	<p>(3.252) Number _____ The supply will be Adequate _____(1) Inadequate _____(2) Surplus _____(3)</p>

4. You employ one (or several) graduates of EAP. Think about the last EAP graduate you employed. Why did you select an EAP graduate rather than a graduate from a different institution?

COMPETENCY ASSESSMENT: INSTRUCTIONS

5. In the following part of the study, you will find eight general areas of competency development that are thought to be needed in one or more agricultural fields. Each general area contains 10 to 20 specific competencies. Please respond to each competency three times.

Your first response will describe the most recent EAP graduate you employed. If you are self-employed, it might be you. Try to describe the employee as accurately as you can based on his/her competency at the time of employment. This response is labeled WAS on the competency form. It is identified with the letter A.

The second response should describe the level of competency you would have preferred the last employee to have had when first hired in order to adequately perform the job for which he/she was hired. This response is labeled preferred on the competency form (for would have preferred competency at this level). It is identified with the letter B.

The third response is for your perception of the level of competence you expect new employees whom you employ three to five years from now to have when they are employed. This response is labeled expected. It is identified with the letter C.

You are asked to rank each competency on a scale from 0 to 5. The brief headings on the questionnaire are as follows.

Number

- | | |
|---|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 0 | This competency is not necessary in the job the employee performs. |
| 1 | The employee has neither studied nor utilized the competency. |
| 2 | The employee has (or should have) studied or utilized the competency, but is not able to perform either independently or with supervision. |
| 3 | Employee is knowledgeable enough about the competency so he/she can perform with supervision. |
| 4 | Employee has enough knowledge about the competency that you can depend on the employee to perform the competency independently without supervision. |
| 5 | Employee has enough knowledge about the competency that you could depend on the employee to teach others how to perform the competency or gain knowledge the competency requires. |

Example:

You hired a new employee, a graduate of EAP last year. You recorded your perception of the employee's level of competence for the Horticultural Production competency listed below. If you perceive that the employee, when hired, could perform the task with supervision, circle the appropriate number (3 in this case) in the WAS (A) response category.

As you think about the job and the job assignment, you would have preferred that the employee could have done the job without supervision. You indicate so by scoring the same competency under the preferred set of responses (B) by circling the 4.

In thinking ahead three to five years, you expect persons you hire three to five years from now will not have to be skilled enough to perform in this competency, but should still have studied or observed the competency area, since you think your clients will seek assistance in performing the competency from other sources. Thus, you rate the expected set of responses to reflect that belief (C). You show this expectation by circling the 1.

<u>HORTICULTURAL PRODUCTION</u>	A. <u>Was</u>	B. <u>Preferred</u>	C. <u>Expected</u>
Identify insects, insect damage and select insecticides or cultural practices for insect control on various vegetable crops.	<u>3</u>	<u>4</u>	<u>1</u>

Note to interviewers:

See the last page for the responses to Section II.

III. PERSONAL ATTRIBUTES OF THE EMPLOYEE

Schools have a responsibility for providing sound technical training. But they also have a responsibility for teaching and reinforcing other qualities that are generally thought to be desirable in a good employee. Think about the most recent EAP graduate you employed. Ask yourself how you would in general rank the EAP graduates in comparison to all of your other agriculture/agribusiness employees when you consider the following factors.

<u>FACTORS</u>	<u>Above Average</u>	<u>Average</u>	<u>Below Average</u>
6.1 Loyalty to the employer and business or agency	_____	_____	_____
6.2 Positive attitude toward work of all kinds at all levels	_____	_____	_____
6.3 Honesty in dealing with others	_____	_____	_____
6.4 Promptness and dependability in coming to work	_____	_____	_____
6.5 Self-confidence in employee's own ability	_____	_____	_____
6.6 Employee's acceptance of terms, conditions, and environment of the work place	_____	_____	_____
6.7 Employee's acceptance of responsibilities	_____	_____	_____
6.8 Employee's willingness to work together in cooperative effort	_____	_____	_____
6.9 Ability to establish and achieve goals	_____	_____	_____

IMPORTANCE OF PERSONAL ATTRIBUTES

7. Now that you have ranked the EAP graduates in comparison to other employees, on each of these factors or attributes, please indicate how important you consider each of these factors to be in your decision to hire, retain, and promote the employee. Rank each of the following factors on a scale of importance from 1 to 10 (1 being least important and 10 being most important).

7.1	Communication skills	1	2	3	4	5	6	7	8	9	10
7.2	Loyalty	1	2	3	4	5	6	7	8	9	10
7.3	Attitude toward work	1	2	3	4	5	6	7	8	9	10
7.4	Honesty	1	2	3	4	5	6	7	8	9	10
7.5	Punctuality and dependability	1	2	3	4	5	6	7	8	9	10
7.6	Self-confidence	1	2	3	4	5	6	7	8	9	10
7.7	General business sense and knowledge	1	2	3	4	5	6	7	8	9	10
7.8	Satisfaction with job	1	2	3	4	5	6	7	8	9	10
7.9	Acceptance of responsibility	1	2	3	4	5	6	7	8	9	10
7.10	Cooperation	1	2	3	4	5	6	7	8	9	10
7.11	Establish and achieve goals	1	2	3	4	5	6	7	8	9	10
7.12	Technical agriculture knowledge	1	2	3	4	5	6	7	8	9	10

ANSWER SHEET -- SECTION II

0	1	2	3	4	5
not needed	not studied or utilized	studied or used but not able to perform	can perform with supervision	can perform without supervision	can instruct others in competency

A. Agricultural Mechanics

(A) was
(B) preferred
(C) expected

	A	B	C
1.	___	___	___
2.	___	___	___
3.	___	___	___
4.	___	___	___
5.	___	___	___
6.	___	___	___

D. Agribusiness

(A) was
(B) preferred
(C) expected

	A	B	C
1.	___	___	___
2.	___	___	___
3.	___	___	___
4.	___	___	___
5.	___	___	___
6.	___	___	___
7.	___	___	___

G. Livestock

(A) was
(B) preferred
(C) expected

	A	B	C
1.	___	___	___
2.	___	___	___
3.	___	___	___
4.	___	___	___
5.	___	___	___
6.	___	___	___
7.	___	___	___

B. Crop Production

(A) was
(B) preferred
(C) expected

	A	B	C
1.	___	___	___
2.	___	___	___
3.	___	___	___
4.	___	___	___
5.	___	___	___
6.	___	___	___
7.	___	___	___
8.	___	___	___
9.	___	___	___

E. Communications

(A) was
(B) preferred
(C) expected

	A	B	C
1.	___	___	___
2.	___	___	___
3.	___	___	___
4.	___	___	___
5.	___	___	___
6.	___	___	___
7.	___	___	___
8.	___	___	___
9.	___	___	___

C. Soils, Fertility and Conservation

(A) was
(B) preferred
(C) expected

	A	B	C
1.	___	___	___
2.	___	___	___
3.	___	___	___
4.	___	___	___
5.	___	___	___
6.	___	___	___
7.	___	___	___

F. Economic Management and Marketing

(A) was
(B) preferred
(C) expected

	A	B	C
1.	___	___	___
2.	___	___	___
3.	___	___	___
4.	___	___	___
5.	___	___	___
6.	___	___	___
7.	___	___	___
8.	___	___	___

H. Horticulture

(A) was
(B) preferred
(C) expected

	A	B	C
1.	___	___	___
2.	___	___	___
3.	___	___	___
4.	___	___	___
5.	___	___	___
6.	___	___	___
7.	___	___	___
8.	___	___	___
9.	___	___	___
10.	___	___	___
11.	___	___	___

SAMPLE CARD

- Agricultural
Production
- Agricultural
Processing
- Marketing and
Distribution
- Agricultural Supplies
and Service
- Finance and Credit
- Education
- Governmental Agencies

ENTREVISTA NUMERO 1
EMPLEADOR DE ZAMORANO

Información Preliminar:

Fecha _____ País _____ Sello _____
 Nombre del Entrevistador _____
 Persona Entrevistada _____
 Nombre del Negocio _____ Firma _____
 Dirección _____

- Bus.Code 1. Clase de Negocio (Marque con un círculo)
- | | | |
|--------|-----------------------------|----------------------------------------|
| 1.0() | 1.1 Producción Agrícola | 1.2 Elaboración de Productos Agrícolas |
| | 1.3 Mercadeo y Distribución | 1.4 Venta, Instalación y Reparación |
| | 1.5 Finanzas y Crédito | 1.6 Educación |
| | | 1.7 Agencias Gubernamentales |

2. Nombre de la persona y cargo desempeñado: _____

Si es usted esta persona, describa el título de su cargo y su trabajo

Job Code 3. Para poder formar un criterio sobre las necesidades de recursos humanos en el sector agrícola, por favor denos una idea de la cantidad de personas que usted emplea actualmente, o que planea emplear en el futuro para mejorar el calibre de sus empleados o para ampliar su negocio o empresa. Le rogamos una estimación realista en cada categoría. Si es usted propietario, inclúyase también.

- 3.1 Total de empleados en el negocio - Toda clase (3.11) _____
- Número de empleados a tiempo completo (3.12) _____
- Número de empleados a tiempo parcial (3.13) _____

3.2 Asesoría de la oferta y demanda de empleados en el sector agrícola

Preparación Académica del Empleado	Empleados Actuales	Requerimientos de Empleados en el Futuro
(3.21) Graduado de primaria	(3.211) Número _____	
(3.22) Graduado de Escuela Secundaria Agrícola	(3.221) Número _____	(3.222) Número _____ La oferta será Suficiente _____ (1) Insuficiente _____ (2) Excesiva _____ (3)

<p>(3.23) Personas con tres años de estudios agropecuarios y con título o grado.</p>	<p>(3.231) Número _____ Colegio del cual se graduaron. 1. _____ 2. _____ 3. _____</p>	<p>(3.232) Número _____ La oferta será Suficiente _____(1) Insuficiente _____(2) Excesivo _____(3)</p>
<p>(3.24) Personas con grado Universitario en estudios Agropecuarios.</p>	<p>(3.241) Número _____ Universidad de la cual se graduaron. 1. _____ 2. _____ 3. _____</p>	<p>(3.242) Número _____ La oferta será Suficiente _____(1) Insuficiente _____(2) Excesivo _____(3)</p>
<p>(3.25) Profesionales con la maestría o el doctorado.</p>	<p>(3.251) Número _____ Universidad de la cual se graduaron. 1. _____ 2. _____ 3. _____</p>	<p>(3.252) Número _____ La oferta será Suficiente _____(1) Insuficiente _____(2) Excesivo _____(3)</p>

4. Ud. emplea uno (o varios) graduados de EAP.
Piense detenidamente acerca del último graduado de la EAP que Ud. empleó.
¿Por qué seleccionó un graduado de EAP en lugar de un graduado de otra institución?

ASESORAMIENTO DE DESTREZA: INSTRUCCIONES

5. En la siguiente parte del estudio, se encuentran ocho (8) áreas de enseñanza en la educación agrícola que contienen una serie de destrezas (habilidades, conocimiento, actitudes). El propósito es de evaluar o describir al empleado más reciente graduado de la EAP.

La primera respuesta describirá al empleado con la mayor exactitud posible, basándose en el grado de destreza que el/ella tuvo cuando comenzó a trabajar. Esta clasificación contiene la palabra Tuvo en el formulario y se ha identificado con la letra A.

La segunda respuesta debe describir el grado de destreza que Ud. hubiera preferido que este empleado hubiese tenido cuando comenzó a trabajar. Esta respuesta está calificada Preferido en el formulario e identificada con la letra B.

La tercera clasificación es para percibir el grado de destreza que Ud. espera que los empleados tengan en el futuro al comenzar las funciones del cargo para el cual serán empleados. Esta respuesta está calificada bajo la palabra Espero e identificada con la letra C.

La siguiente escala contiene las clasificaciones para determinar hasta que punto o grado Ud. cree que esta persona estuvo o debió haber estado capacitada:

Numero

- | | |
|---|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 0 | Esta destreza <u>no es necesaria</u> en el cargo que este empleado desempeña. |
| 1 | Este empleado no ha estudiado u observado esta destreza |
| 2 | El empleado ha estudiado u observado esta destreza, pero no es capaz de desempeñarse ni independientemente ni con supervisión. |
| 3 | El empleado conoce a fondo esta destreza y el/ella puede desempeñarse con supervisión. |
| 4 | El empleado conoce a fondo esta destreza y el/ella puede desempeñarse independientemente sin supervisión. |
| 5 | El empleado conoce a fondo esta destreza y el/ella puede enseñar a otros como desempeñarse en estas funciones o puede ayudarlos a adquirir el conocimiento necesario. |

Ejemplo:

Su nuevo empleado se graduó de la EAP. Usted va a evaluar su destreza en Horticultura. Si usted cree que este empleado cuando comenzó a trabajar, pudo desempeñarse sin supervisión, indíquelo con el número apropiado (en este caso el número 3) en la clasificación (A).

<u>HORTICULTURA</u>	A <u>Tuvo</u>	B. <u>Preferido</u>	C. <u>Espero</u>
Reconoce e identifica insectos y daños causados por estos. Escoge insecticidas o métodos apropiados para controlarlos.	<u>3</u>	<u>4</u>	<u>1</u>

Si Usted hubiera preferido que el empleado se hubiera desempeñado sin supervisión de ninguna clase al llevar a cabo esta tarea, indíquelo marcando esta misma destreza bajo la clasificación (B) con el número 4.

Piense detenidamente acerca del futuro. Si Ud. cree que sus nuevos empleados no tendrán el conocimiento necesario en esta destreza, pero que si deben estudiar u observar esta destreza durante su adiestramiento. Si usted espera esto de sus empleados, indíquelo así marcando la categoría (C) con el número 1.

Nota a los entrevistadores:

Véase la última página para las respuestas de la sección II.

III. ATRIBUTOS PERSONALES DEL EMPLEADO

Las instituciones educacionales tienen la responsabilidad de proveer un sólido entrenamiento técnico; pero también tienen la responsabilidad de enseñar y reforzar otras aptitudes. Piense detenidamente acerca del último graduado de EAP que Ud. ha empleado.

Pregúntese como clasifica en comparación con sus otros empleados en las ramas de agricultura y agronegocios. Base su opinión en lo siguiente:

<u>FACTORES</u>	<u>Superior</u>	<u>Igual</u>	<u>Inferior</u>
6.1 Lealtad al patrono	_____	_____	_____
6.2 Disposición mental hacia toda clase de trabajo en todos los niveles	_____	_____	_____
6.3 Sinceridad en su trato con otros	_____	_____	_____
6.4 Puntualidad y confiabilidad en el trabajo	_____	_____	_____
6.5 Confianza en si mismo y en su habilidad personal	_____	_____	_____
6.6 Aceptación de los terminos, de las condiciones y del ambiente en el lugar de trabajo	_____	_____	_____
6.7 Aceptación de responsabilidades	_____	_____	_____
6.8 Habilidad de trabajar con otros en un ambiente de cooperación y mutuo esfuerzo	_____	_____	_____
6.9 Habilidad de establecer y alcanzar las metas	_____	_____	_____

IMPORTANCIA DE LOS ATRIBUTOS PERSONALES

7. Indique el grado de importancia que Ud. le da a los atributos personales al emplear o promover a un empleado.

7.1	Habilidad en comunicación	1	2	3	4	5	6	7	8	9	10
7.2	Lealtad	1	2	3	4	5	6	7	8	9	10
7.3	Disposición mental hacia el trabajo	1	2	3	4	5	6	7	8	9	10
7.4	Honestidad	1	2	3	4	5	6	7	8	9	10
7.5	Puntualidad y confiabilidad	1	2	3	4	5	6	7	8	9	10
7.6	Confianza en si mismo	1	2	3	4	5	6	7	8	9	10
7.7	Conocimiento y sentido común para el negocio en general	1	2	3	4	5	6	7	8	9	10
7.8	Satisfacción en su trabajo	1	2	3	4	5	6	7	8	9	10
7.9	Aceptación de responsabilidad	1	2	3	4	5	6	7	8	9	10
7.10	Cooperación	1	2	3	4	5	6	7	8	9	10
7.11	Establecimiento y logro de metas deseadas	1	2	3	4	5	6	7	8	9	10
7.12	Conocimiento de técnicas agrícolas	1	2	3	4	5	6	7	8	9	10

HOJA DE RESPUESTAS--SECCION II

0	1	2	3	4	5
No es necesaria	no estudió u observó	estudió y observó pero no se desempeña	Se desempeña con supervisión	Se desempeña sin supervisión	Puede enseñar a otros

A. Mecanización Agrícola

- (A) tuvo
 (B) preferido
 (C) se espera
- | | | | |
|----|-----|-----|-----|
| | A | B | C |
| 1. | --- | --- | --- |
| 2. | --- | --- | --- |
| 3. | --- | --- | --- |
| 4. | --- | --- | --- |
| 5. | --- | --- | --- |
| 6. | --- | --- | --- |

D. Agro Negocios

- (A) tuvo
 (B) preferido
 (C) se espera
- | | | | |
|----|-----|-----|-----|
| | A | B | C |
| 1. | --- | --- | --- |
| 2. | --- | --- | --- |
| 3. | --- | --- | --- |
| 4. | --- | --- | --- |
| 5. | --- | --- | --- |
| 6. | --- | --- | --- |
| 7. | --- | --- | --- |

G. Ganadería

- (A) tuvo
 (B) preferido
 (C) se espera
- | | | | |
|----|-----|-----|-----|
| | A | B | C |
| 1. | --- | --- | --- |
| 2. | --- | --- | --- |
| 3. | --- | --- | --- |
| 4. | --- | --- | --- |
| 5. | --- | --- | --- |
| 6. | --- | --- | --- |
| 7. | --- | --- | --- |

B. Agronomía

- (A) tuvo
 (B) preferido
 (C) se espera
- | | | | |
|----|-----|-----|-----|
| | A | B | C |
| 1. | --- | --- | --- |
| 2. | --- | --- | --- |
| 3. | --- | --- | --- |
| 4. | --- | --- | --- |
| 5. | --- | --- | --- |
| 6. | --- | --- | --- |
| 7. | --- | --- | --- |
| 8. | --- | --- | --- |
| 9. | --- | --- | --- |

E. Comunicaciones

- (A) tuvo
 (B) preferido
 (C) se espera
- | | | | |
|----|-----|-----|-----|
| | A | B | C |
| 1. | --- | --- | --- |
| 2. | --- | --- | --- |
| 3. | --- | --- | --- |
| 4. | --- | --- | --- |
| 5. | --- | --- | --- |
| 6. | --- | --- | --- |
| 7. | --- | --- | --- |
| 8. | --- | --- | --- |
| 9. | --- | --- | --- |

C. Suelo, Fertilidad de Suelo

- (A) tuvo
 (B) preferido
 (C) se espera
- | | | | |
|----|-----|-----|-----|
| | A | B | C |
| 1. | --- | --- | --- |
| 2. | --- | --- | --- |
| 3. | --- | --- | --- |
| 4. | --- | --- | --- |
| 5. | --- | --- | --- |
| 6. | --- | --- | --- |
| 7. | --- | --- | --- |

F. Administración Económica

- (A) tuvo
 (B) preferido
 (C) se espera
- | | | | |
|----|-----|-----|-----|
| | A | B | C |
| 1. | --- | --- | --- |
| 2. | --- | --- | --- |
| 3. | --- | --- | --- |
| 4. | --- | --- | --- |
| 5. | --- | --- | --- |
| 6. | --- | --- | --- |
| 7. | --- | --- | --- |
| 8. | --- | --- | --- |

H. Horticultura

- (A) tuvo
 (B) preferido
 (C) se espera
- | | | | |
|----|-----|-----|-----|
| | A | B | C |
| 1. | --- | --- | --- |
| 2. | --- | --- | --- |
| 3. | --- | --- | --- |
| 4. | --- | --- | --- |
| 5. | --- | --- | --- |
| 6. | --- | --- | --- |
| 7. | --- | --- | --- |

<p>(3.23) Persons who have two years of post-secondary agricultural study.</p>	<p>(3.231) Number _____ Institutions from which you hired most of your graduates. 1. _____ 2. _____ 3. _____</p>	<p>(3.232) Number _____ The supply will be Adequate _____(1) Inadequate _____(2) Surplus _____(3)</p>
<p>(3.24) Persons who have a bachelor's degree in an agricultural field.</p>	<p>(3.241) Number _____ Institutions from which you hired most of your graduates. 1. _____ 2. _____ 3. _____</p>	<p>(3.242) Number _____ The supply will be Adequate _____(1) Inadequate _____(2) Surplus _____(3)</p>
<p>(3.25) Advanced professionals who have a master's or a doctorate in an agricultural discipline.</p>	<p>(3.251) Number _____ Institutions from which you hired most of your graduates. 1. _____ 2. _____ 3. _____</p>	<p>(3.252) Number _____ The supply will be Adequate _____(1) Inadequate _____(2) Surplus _____(3)</p>

4. If you do not employ (or have employed) a graduate of EAP, please indicate the reason or reasons for which you have not employed them.

COMPETENCY ASSESSMENT: INSTRUCTIONS

5. In the following part of the study, you will find eight general areas of competency development that are thought to be needed in one or more agricultural fields. Each general area contains 10 to 20 specific competencies. Please evaluate or describe the type of professional whom you would employ in the future.

Your response will describe the level of competency which you expect your employees to have in the future when they are hired for a position. This response will be classified as expected and identified by the letter A.

The following scale contains the classifications which will determine the competency level which you believe each person will need in his/her position.

Number

- 0 This competency is not necessary in the job the employee performs.
- 1 The employee has neither studied nor utilized the competency.
- 2 The employee has (or should have) studied or utilized the competency, but is not able to perform either independently or with supervision.
- 3 Employee is knowledgeable enough about the competency so he/she can perform with supervision.
- 4 Employee has enough knowledge about the competency that you can depend on the employee to perform the competency independently without supervision.
- 5 Employee has enough knowledge about the competency that you could depend on the employee to teach others how to perform the competency or gain knowledge the competency requires.

Example:

In thinking ahead three to five years, you expect persons you hire three to five years from now will not have to be skilled enough to perform in this competency, but should still have studied or observed the competency area, since you think your clients will seek assistance in performing the competency from other sources; you show this expectation by circling the 1.

HORTICULTURAL PRODUCTION

Expected

Identify insects, insect damage
and select insecticides or
cultural practices for insect
control on various vegetable crops.

1

6. XXXXXX

IMPORTANCE OF PERSONAL ATTRIBUTES

7. Considering your employees in general, please indicate how important you consider each of these factors to be in your decision to hire, retain, and promote the employee. Rank each of the following factors on a scale of importance from 1 to 10 (1 being least important and 10 being most important).

7.1	Communication skills	1	2	3	4	5	6	7	8	9	10
7.2	Loyalty	1	2	3	4	5	6	7	8	9	10
7.3	Attitude toward work	1	2	3	4	5	6	7	8	9	10
7.4	Honesty	1	2	3	4	5	6	7	8	9	10
7.5	Punctuality and dependability	1	2	3	4	5	6	7	8	9	10
7.6	Self-confidence	1	2	3	4	5	6	7	8	9	10
7.7	General business sense and knowledge	1	2	3	4	5	6	7	8	9	10
7.8	Satisfaction with job	1	2	3	4	5	6	7	8	9	10
7.9	Acceptance of responsibility	1	2	3	4	5	6	7	8	9	10
7.10	Cooperation	1	2	3	4	5	6	7	8	9	10
7.11	Establish and achieve goals	1	2	3	4	5	6	7	8	9	10
7.12	Technical agriculture knowledge	1	2	3	4	5	6	7	8	9	10

ANSWER SHEET -- SECTION II

0	1	2	3	4	5
not needed	not studied or utilized	studied or used but not able to perform	can perform with supervision	can perform without supervision	can instruct others in competency

A. Agricultural Mechanics

preferred

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

D. Agribusiness

preferred

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____

G. Livestock

preferred

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____

B. Crop Production

preferred

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____

E. Communications

preferred

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____

C. Soils, Fertility and
Conservation

preferred

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____

F. Economic Man-
agement and
Marketing

preferred

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____

H. Horticulture

preferred

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____

ENTREVISTA NUMERO 2
OTRO EMPLEADOR

Información Preliminar:

Fecha _____ País _____

Sello _____

Nombre del Entrevistador _____

Persona Entrevistada _____

Nombre del Negocio _____

Dirección _____

Firma _____

- Bus.Code 1. Clase de Negocio (Marque con un círculo)
- 1.0() 1.1 Producción Agrícola 1.2 Elaboración de Productos Agrícolas
1.3 Mercadeo y Distribución 1.4 Venta, Instalación y Reparación
1.5 Finanza y Crédito 1.6 Educación 1.7 Agencias Gubernamentales

2. XXXXXXXX

Job Code 3. Para poder formar un criterio sobre las necesidades de recursos humanos en el sector agrícola, por favor denos una idea de la cantidad de personas que usted emplea actualmente, o que planea emplear en el futuro para mejorar el calibre de sus empleados o para ampliar su negocio o empresa. Le rogamos una estimación realista en cada categoría. Si es usted propietario, inclúyase tambien.

2.1 ()

- 3.1 Total de empleados en el negocio - Toda clase (3.11) _____
Número de empleados a tiempo completo (3.12) _____
Número de empleados a tiempo parcial (3.13) _____

3.2 Asesoría de la oferta y demanda de empleados en el sector agrícola

Preparación Académica del Empleado	Empleados Actuales	Requerimientos de Empleados en el Futuro
(3.21)	(3.211)	
Graduado de primaria	Número _____	

(3.21) Graduado de primaria (3.211) Número _____

(3.22) Graduado de Escuela Secundaria Agrícola

(3.221) Número _____

(3.222) Número _____
La oferta será
Suficiente _____ (1)
Insuficiente _____ (2)
Excesiva _____ (3)

(3.23) Personas con tres años de estudios agropecuarios y con título o grado.	(3.231) Número _____ Colegio del cual se graduaron. 1. _____ 2. _____ 3. _____	(3.232) Número _____ La oferta será Suficiente _____(1) Insuficiente _____(2) Excesiva _____(3)
(3.24) Personas con grado de Licenciado Universitario en estudios Agropecuarios.	(3.241) Número _____ Universidad de la cual se graduaron. 1. _____ 2. _____ 3. _____	(3.242) Número _____ La oferta será Suficiente _____(1) Insuficiente _____(2) Excesiva _____(3)
(3.25) Profesionales con la maestría o el doctorado.	(3.251) Número _____ Universidad de la cual se graduaron. 1. _____ 2. _____ 3. _____	(3.252) Número _____ La oferta será Suficiente _____(1) Insuficiente _____(2) Excesiva _____(3)

4. Si Ud. no emplea (o ha empleado) un Zamorano, por favor indique alguna razón o razones por las cuales no tiene o no ha empleado a un Zamorano.

ASESORAMIENTO DE DESTREZA: INSTRUCCIONES

5. En la siguiente parte del estudio, encontrara ocho (8) areas de ensenanza en la educacion agrícola que contiene una serie de destrezas (habilidades, conocimiento, actitudes). El propósito es de evaluar o describir el tipo de profesional que Ud. emplearía en el futuro.

Su respuesta debe describir el grado de destreza que Ud. espera que los empleados tengan en el futuro al comenzar las funciones del cargo para el cual serán empleados. Esta respuesta está calificada bajo la palabra Espera e identificada con la letra A.

La siguiente escala contiene las clasificaciones para determinar hasta que punto o grado Ud cree que esta persona fue o debería ser capacitada.

Numero

- 0 Esta destreza no es necesaria en el cargo que este empleado desempeña.
- 1 Este empleado no ha estudiado u observado esta destreza
- 2 El empleado ha estudiado u observado esta destreza, pero no es capaz de desempeñarse ni independientemente ni con supervision.
- 3 El empleado conoce a fondo esta destreza y el/ella puede desempeñarse con supervisión.
- 4 El empleado conoce a fondo esta destreza y el/ella puede desempeñarse independientemente sin supervisión.
- 5 El empleado conoce a fondo esta destreza y el/ella puede enseñar a otros como desempeñarse en estas funciones o puede ayudarlos a adquirir el conocimiento necesario.

Ejemplo:

Piense detenidamente acerca del futuro, si Ud. cree que sus nuevos empleados que trabajarán para Usted no tendrán el conocimiento necesario en esta destreza, pero que si deben estudiar u observar esta destreza durante su adiestramiento para poder ayudar a clientes quienes de otra forma buscarán esta ayuda en otra parte, indíquelo así marcando la categoría se ESPERA con el número 1.

HORTICULTURA

Se Espera

Reconoce e identifica insectos y danos causados por estos.
Escoje insecticidas o metodos apropiados para controlarlos.

1

6. XXXXXXXXX

IMPORTANCIA DE LOS ATRIBUTOS PERSONALES

7. Considerando a sus empleados en general, por favor indique el grado de importancia que Ud. les da a estos atributos y como pesan en su decisión al emplear, retener o promover a un empleado.

7.1	Habilidad en comunicación	1	2	3	4	5	6	7	8	9	10
7.2	Lealtad	1	2	3	4	5	6	7	8	9	10
7.3	Disposición mental hacia el trabajo	1	2	3	4	5	6	7	8	9	10
7.4	Honestidad	1	2	3	4	5	6	7	8	9	10
7.5	Puntualidad y confiabilidad	1	2	3	4	5	6	7	8	9	10
7.6	Confianza en si mismo	1	2	3	4	5	6	7	8	9	10
7.7	Conocimiento y sentido común para el negocio en general	1	2	3	4	5	6	7	8	9	10
7.8	Satisfacción en su trabajo	1	2	3	4	5	6	7	8	9	10
7.9	Aceptación de responsabilidad	1	2	3	4	5	6	7	8	9	10
7.10	Cooperación	1	2	3	4	5	6	7	8	9	10
7.11	Establecimiento y alcance de metas deseadas	1	2	3	4	5	6	7	8	9	10
7.12	Conocimiento de técnicas agrícolas	1	2	3	4	5	6	7	8	9	10

SECCION II ASESORAMIENTO DE DESTREZAS

Respuestas del Empleador

0	1	2	3	4	5
No es necesaria	no estudió u observó	estudió y observó pero no se desempeña	Se desempeña con supervisión	Se desempeña sin supervisión	Puede enseñar a otros

Espero

A. Mecanización Agrícola
espero

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

D. Agro Negocios
espero

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____

G. Ganadería
espero

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____

B. Agronomía

espero

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____

E. Comunicaciones

espero

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____

H. Horticultura y Dasonomía
espero

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____

C. Suelo, Fertilidad de Suelos y Conservación
espero

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____

F. Economía Agrícola y Mercadeo
espero

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____

COMPETENCIES FOR SECTION II

AGRICULTURAL MECHANICS

1. Maintain and use major types of tools (both hand and power operated) used in fabrication and repair of agricultural machines and equipment.
2. Select/calculate the cost and procure the necessary stock material for a planned fabrication project.
3. Maintain, and operate primary tillage, planting, fertilization, and harvesting equipment for crops of economic importance.
4. Calibrate planting, fertilization, and pest control equipment employing best known safety precautions and procedures.
5. Operate, service, adjust, and make minor repairs on internal combustion engines.
6. Determine the appropriate mechanical technology to use to maximize returns to available sources.
4. Identify symptoms and causal agents of diseases common to economically important crops. Describe the control measures of diseases common to economically important crops.
5. Identify and describe insects that are beneficial and harmful to economically important crops. Describe the cultural, chemical, and biological control programs for harmful insects.
6. List the common cultural and chemical methods for weed control.
7. Describe advantages and disadvantages of various methods of harvesting economically important crops.
8. Plan a crop storage facility for crops stored for home use/livestock feed or for market.
9. Describe the factors that regulate the market (supply and demand). Describe the factors that determine the price received by sellers throughout the marketing system.

CROP PRODUCTION

1. Identify the common parts of all plants and other crops common to the zone where he/she works.
2. Select appropriate crop varieties considering maturity, harvestability, disease resistance, lodging resistance, insect resistance, and yield.
3. Knows the essential requirements and steps in preparing a seed bed for crops grown for subsistence and market.

SOILS, SOIL FERTILITY, AND CONSERVATION

1. Describe the physical features, degree of erosion, internal drainage, soil texture, and topography.
2. Plan a land use program on the basis of capability classification that will maximize productivity and protect soil from erosion.
3. Test and interpret soil test results and make fertilizer recommendations based upon yield goals.
4. Recognize nutrient deficiency in soils through plant symptoms and know how to correct the problem.

5. Apply or recommend applications of various fertilizer materials at optimum time.
6. Describe the proper conservation practices with various land capability classes. Plan a crop rotation system.
7. Select tillage practices that maintain soil structure and reduce compaction and soil erosion.

AGRIBUSINESS

1. Identify and use sources of capital wisely in the establishment and operation of an agricultural business.
2. Determine cost of production of agricultural products and services.
3. Plan a cash flow and operating budget for a business.
4. Develop a business plan for organizing and operating the business.
5. Prepare a plan for training business workers to improve labor productivity.
6. Describe the influence of public policy on the operation and maintenance of an agricultural non-farm business.
7. Prepare, summarize, and interpret financial reports.

COMMUNICATION AND HUMAN RELATIONS SKILLS

1. Prepare and deliver effective oral presentations.
2. Write in a clear and concise manner that conveys the intended message.

3. Meet people and discuss common interest topics.
4. Work with others--respect the position of superiors and well as those in lower positions.
5. Supervise others while maintaining congenial rapport.
6. Listen attentively for content and context of the communication.
7. Identify the responsibilities of a job and translate to a job description.
8. Use appropriate procedures and techniques of persuasion in sales and promotion.
9. Respect the views and rights of others regardless of position.

ECONOMIC MANAGEMENT AND MARKETING

1. Determine the marketing alternatives available for agricultural products that will secure the best price for sellers.
2. Calculate expected returns and profits from individual enterprises and combinations of enterprises on farms of various sizes.
3. Compare and contrast individual, cooperative, and corporate marketing strategies and describe the potential advantages and disadvantages of each strategy.
4. Identify sources of credit for agriculture and the most appropriate use of credit in the agricultural sector.
5. Prepare a budget for a farm or related business.
6. List steps to follow in managing the farm business to maximize returns to available sources.

7. Describe government policies that affect the operation and maintenance of an agribusiness.
8. Summarize and analyze the records of a farm or non-farm business to determine strengths and weaknesses of the business operation.

LIVESTOCK

1. Use nutrient analyses of livestock feeds common to the area to formulate balanced livestock feed rations.
2. Plan a breeding system that will result in desired genetic improvement of progeny.
3. Diagnose and recommend treatment for common livestock diseases and parasitic infections.
4. Plan shelter and facilities that provide for economical livestock production.
5. Describe the domestic and international policies that have an impact on the market (supply-demand) for livestock and livestock products.
6. Plan livestock programs for subsistence and market use that will maximize the return to resources.
7. Identify the steps and describe quality processing of beef, pork, and poultry.

HORTICULTURE

1. Identify the common parts of horticultural plants and list their major function.

2. Select appropriate fruit, vegetable, and ornamental plants, based on maturity, harvestability, disease resistance, insect resistance, and yield for different environmental conditions.
3. List the seedbed preparation and propagation requirements for fruits and vegetables common to that environment.
4. Identify symptoms, names, and causal agent diseases common to fruits and vegetables in tropical America.
5. Identify the insects that are beneficial and harmful to the economically important fruit, vegetable, and ornamental crops.
6. Describe the common cultural and chemical weed control methods in fruit, vegetable, and ornamental horticultural crops.
7. Describe the harvest and storage of horticulture crops for maintaining quality and maximizing yield.
8. Identify tree species and characteristics suitable for culture in various areas of tropical America for commercial use.
9. Describe nursery procedures for propagation of tree seedlings to be used in reforestation programs.
10. Utilize methods for protection against forest fires, insects, diseases, and forest animals.
11. Identify multiple use of forests and the effect on our environment of commercial, exotic, or native species common to tropical and sub-tropical America.

HABILIDADES Y DESTREZAS

MECANIZACION Y MECANICA AGRICOLA

1. Mantiene y usa herramientas (manuales y mecánicas) para la reparación de maquinaria agrícola, equipo, etc.
2. Calcula el costo, y suministra el material necesario para la planificación y fabricación de un proyecto.
3. Mantiene y opera el equipo de siembra, fertilización y cosecha de cultivos de mayor importancia económica.
4. Calibra los equipos usados en la siembra, fertilización y control de plagas, empleando los métodos necesarios y tomando las precauciones para mayor seguridad personal.
5. Opera, mantiene, ajusta y hace reparaciones menores en motores de combustión interna.
6. Escoge maquinaria con la tecnología más apropiada para conseguir las máximas ganancias con los recursos disponibles.
4. Reconoce los síntomas y agentes de enfermedades comunes a cultivos de mayor importancia y utiliza las medidas de control más efectivas.
5. Identifica y describe insectos que son beneficiosos así como también insectos nocivos; utiliza métodos químicos y biológicos de control de culturas químicas y biológicas.
6. Usa métodos de cultura y químicos para el control de hierbas nocivas.
7. Se aprovecha de las ventajas y de las desventajas de diversos métodos de cosechas de cultivos de mayor importancia económica.
8. Hace un plan para el almacenamiento de las cosechas para uso doméstico, alimentación de ganado y mercadeo.
9. Describe los diferentes factores que afectan y regulan los precios recibidos por los productores en el comercio.

AGRONOMIA

1. Conoce los términos botánicos de la mayor parte de los cultivos en la zona donde trabaja.
2. Selecciona las variedades de cultivos más apropiadas tomando en cuenta el tiempo de madurar, facilidad para cosechar, resistencia a enfermedades e insectos, y rendimiento.
3. Sabe preparar el terreno para cultivos de uso doméstico y para los de venta en el mercado.
1. Describe las propiedades físicas, el grado de erosión, drenaje, composición del suelo, y topografía.
2. Planea un programa para el mejor uso de las tierras, basándose en la capacidad y clasificación, para hacer uso máximo de la productividad y proteger el suelo contra la erosión.
3. Toma muestras e interpreta los resultados de pruebas de suelo y recomienda fertilizantes basándose en la meta de rendimiento deseado.

4. Reconoce las deficiencias nutritivas del suelo basándose en síntomas, en las plantas, y sabe como corregir el problema.
5. Aplica o recomienda la aplicación de fertilizantes durante el tiempo más favorable y calibra el equipo de fertilización.
6. Describe los métodos de conservación de suelos más apropiados para las diferentes clases de suelos y planea un sistema de rotación de cultivos.
7. Utiliza métodos de labranza que ayudan a mantener la estructura del suelo; reduce la compactación y erosión del mismo.

AGRO NEGOCIOS

1. Identifica fuentes de capital para establecer y operar negocios agrícolas.
2. Determina el costo de producción y de servicios para el comercio de ciertos productos agrícolas.
3. Hace un plan para el movimiento de capital líquido; opera con un presupuesto.
4. Desarrolla un plan para la organización y operación del negocio.
5. Prepara un plan de entrenamiento para los empleados con el fin de mejorar labores productivas.
6. Describe la influencia de ciertas políticas públicas en la operación y mantenimiento de negocios agrícolas.
7. Prepara, sintetiza e interpreta reportes financieros.

COMUNICACIONES Y RELACIONES HUMANAS

1. Prepara y hace presentaciones orales en forma elocuente.
2. Se expresa por escrito en una forma precisa, transmitiendo sus ideas claramente.
3. Habla con la gente acerca de temas de mutuo interés.
4. Colabora con otros y respeta la posición de sus superiores así como la de sus subordinados.
5. Supervisa pero al mismo tiempo congenia con otros.
6. Escucha atentamente al tema de la conversación.
7. Identifica las responsabilidades de un cargo y las describe por escrito.
8. Usa procedimientos y la técnica apropiada en programas de venta y de promoción.
9. Respeto el punto de vista y los derechos de otros, cualquiera que sea su rango.

ECONOMIA AGRICOLA Y MERCADEO

1. Determina las alternativas disponibles para el mercadeo de productos agrícolas, asegurando los mejores precios para los vendedores.
2. Calcula ganancias y réditos para empresas individuales o en combinación con otros negocios, y para fincas de diferentes tamaños.
3. Compara las estrategias de mercadeo de tipo individual y cooperativo. Describe el potencial de cada una de las estrategias y las ventajas y desventajas.

4. Identifica fuentes de crédito agrícola y el uso más apropiado de este crédito, en el sector agrícola.
5. Prepara un presupuesto para una hacienda u otro negocio relacionado a ésta.
6. Administra un negocio agrícola correctamente, buscando obtener las máximas ganancias con los recursos disponibles.
7. Describe la influencia que ejercen políticas de gobierno en la operación y mantenimiento de agro negocios.
8. Sintetiza y analiza los registros llevados por fincas y negocios con el objeto de determinar los métodos más eficaces y las deficiencias en la operación del negocio.

GANADERIA

1. Analiza el contenido nutritivo en los alimentos para ganado y formula raciones balanceadas.
2. Planea y usa un sistema de casta que resultará en el mejoramiento genético de la cría.
3. Examina y recomienda el tratamiento a seguir para la cura de enfermedades y extirpación de parásitos comunes que afectan al ganado.
4. Planea instalaciones para ganado que facilitan una producción más económica.
5. Describe políticas internas e internacionales que afectan la oferta y demanda de ganado y productos ganaderos en el mercado.

6. Determina correctamente el costo y la ganancia y planea programas ganaderos para uso doméstico y para mercadeo.
7. Conoce el mejor proceso de elaboración para carne de res, cerdo, aves de corral, y productos lácteos.

HORTICULTURA

1. Identifica las partes botánicas de plantas y reconoce sus funciones.
2. Selecciona las frutas, hortalizas, y plantas ornamentales más apropiadas a las condiciones climáticas, basándose en madurez, facilidad cosecha, resistencia a pestes e insectos y rendimiento.
3. Prepara la tierra para la siembra y propagación de frutas y hortalizas comunes al medio ambiente.
4. Reconoce síntomas y agentes de enfermedades que afectan a frutas y hortalizas comunes a la América Latina y utiliza los métodos de control más apropiados.
5. Identifica insectos que son beneficiosos y también insectos nocivos a frutas, hortalizas y plantas ornamentales de mucha importancia económica; utiliza programas de control.
6. Describe métodos agrícolas; productos químicos para el control de hierbas nocivas que causan daños a frutas, hortalizas y plantas ornamentales.
7. Usa métodos de cosecha y almacenamiento de productos manteniendo al mismo tiempo la calidad y el máximo rendimiento.

8. Identifica las especies y características de árboles adaptados a la zona de América tropical donde trabaja y la posibilidad técnica y económica de las plantaciones forestales.
9. Describe las funciones y procedimientos de producción, instalación, y manejo de viveros forestales para uso en programas de reforestación.
10. Utiliza métodos de protección contra incendios, plagas de insectos, enfermedades y fauna silvestre.
11. Identifica los usos múltiples de las plantaciones forestales y su efecto en la ecología de las principales especies comerciales, nativas, y exóticas de la América tropical y sub-tropical.

0921Z

OPINIONNAIRE FOR EAP GRADUATES

Name _____ City _____ Country _____ I certify that the responses to this opinionnaire are my own opinons.
Year of Graduation _____
Occupation _____
Interviewer _____ Signature _____
Date _____

EAP has served Tropical America for over 40 years by providing well trained agriculturists for all phases of the agricultural industry throughout Latin America. While the effective impact has been significant, the Board of Directors is taking a forward look to determine if EAP should make changes which would enable the school to make even greater contributions.

The following partial list of alternatives have been proposed as some of the most desirable changes in the academic program and practical training at Zamorano.

Please provide us your opinion of the most desireable changes by listing a First Choice and a Second Choice.

- A. Maintain the program as it is now being conducted with minor curriculum changes to meet current and future agricultural industry needs.
- B. Expand the enrollment to about 1,000 students and maintain the same instructional program model.
- C. Maintain the same enrollment and same 3 year program and establish course work requiring more time leading to a university degree for those students with high scholarship achievement.
- D. Maintain the program as it is; in addition, expand training in research requiring more time leading to a university degree for those students with high scholarships.
- E. With the same or reduced time in school, encourage students to specialize, therefore allowing opportunity for more graduates with existing facilities and budget.
- F. Other programs (please be brief) _____

PRIMARY SELECTION (indicate the letter)

Using your best judgment, indicate how you believe your First Choice would alter the effectiveness of EAP in each of the following areas.

	<u>Improve</u>	<u>Reduce</u>	<u>No Change</u>
1. Ability to get a job	_____	_____	_____
2. Ability to pursue higher education	_____	_____	_____
3. Ability of EAP to maintain the strong discipline development program	_____	_____	_____
4. Ability of graduates to develop and be promoted in their organizations or professions	_____	_____	_____
5. Ability of EAP to meet the employment needs of Latin America	_____	_____	_____
6. Ability of EAP to develop good work habits and values in their students	_____	_____	_____

SECONDARY SELECTION (indicate the letter)

Using your best judgment, indicate how you believe your Second Choice would alter the effectiveness of EAP in each of the following areas.

	<u>Improve</u>	<u>Reduce</u>	<u>No Change</u>
1. Ability to get a job	_____	_____	_____
2. Ability to pursue higher education	_____	_____	_____
3. Ability of EAP to maintain the strong discipline development program	_____	_____	_____
4. Ability of graduates to develop and be promoted in their organizations or professions	_____	_____	_____
5. Ability of EAP to meet the employment needs of Latin America	_____	_____	_____
6. Ability of EAP to develop good work habits and values in their students	_____	_____	_____

ENTREVISTA NUMERO 3
ENTREVISTA DE GRADUADOS DEL ZAMORANO

Nombre _____ Ciudad _____ País _____ Certifico que las
Año de Egreso _____ Ocupación _____ respuestas a esta
Nombre del Entrevistador _____ entrevista son mis
propias opiniones.
Signa _____
Fecha _____

La Escuela Agrícola Panamericana fué fundada hace más de 40 años para impartir educación agrícola de primera clase a estudiantes de toda América Latina combinando lo mejor de la técnica aplicada y la vida del campo con los modernos sistemas de enseñanza de las ciencias agrícolas. Aún cuando el impacto de esta institución ha sido impresionante, la Junta Directiva ha tomado pasos para determinar que necesidades y cambios habrá en la demanda de recursos humanos en el sector agrícola en el futuro, y en que manera puede contribuir el Zamorano en este proceso de suma importancia.

Las siguientes alternativas se han propuesto como unas de las más deseables al considerar cambios en el programa académico y entrenamiento práctico del Zamorano. Por favor dénos su opinión de cuáles de estas alternativas considera Ud. más importantes indicando su primera y segunda selección. Además, hay espacio para que de sugerencias sobre otras alternativas o cualquier otro comentario que quiera dar.

Alternativas:

- A. Mantener el programa en existencia haciendo cambios menores en el curriculum para hacer frente a las presente y futuras necesidades de la industria agrícola.
- B. Aumentar la inscripción hasta 1.000 estudiantes y mantener el mismo modelo o sistema de enseñanza.
- C. Mantener la inscripción al nivel presente con el programa de 3 años y establecer cursos adicionales que requieran más tiempo cuya culminación sería un grado universitario (tal como Ingeniero Agrónomo, Bachelor of Science, etcétera) para aquellos estudiantes de alta calidad académica.
- D. Mantener el programa en existencia y aumentar la capacitación en investigación científica requiriendo más tiempo de aquellos estudiantes de alta erudición para alcanzar un grado universitario.
- E. Animar a los estudiantes a escoger una especialización en cierta rama de la agricultura durante el período de los 3 años de estudios, o en menos tiempo; dando en esta forma la oportunidad a otros estudiantes, usando las mismas facilidades sin aumento en el presupuesto.
- F. Otros programas (describa en breve).

PRIMERA SELECCION (indique la letra) _____

A su manera de pensar, indique su opinión sobre que efecto tendrá para El Zamorano, el cambio que señaló en su Primera Selección con relación a los siguientes factores:

	<u>MEJORARA</u>	<u>REDUCIRA</u>	<u>NINGUN CAMBIO</u>
1. Habilidad de obtener empleo.	_____	_____	_____
2. Capacidad para continuar estudios de post-grado.	_____	_____	_____
3. La capacidad del Zamorano en mantener un programa o sistema estricto de disciplina.	_____	_____	_____
4. Habilidad del egresado de desarrollarse y avanzar en su puesto profesional dentro de su profesión u organismo.	_____	_____	_____
5. Habilidad de la Escuela en preparar recursos humanos para las necesidades de América Latina.	_____	_____	_____
6. Habilidad de la Escuela en desarrollar una mística de trabajo, puntualidad y otros atributos que se adquieren en el ambiente del Zamorano.	_____	_____	_____

SEGUNDA SELECCION (indique la letra) _____

Indique en lo siguiente, su opinión sobre que efecto tendría para El Zamorano el cambio que Ud. señaló en su Segunda Selección con relación a los siguientes factores:

	<u>MEJORARA</u>	<u>REDUCIRA</u>	<u>NINGUN CAMBIO</u>
1. Habilidad de obtener empleo.	_____	_____	_____
2. Capacidad para continuar estudios de post-grado.	_____	_____	_____
3. La capacidad del Zamorano en mantener un programa o sistema estricto de disciplina.	_____	_____	_____
4. Habilidad del egresado de desarrollarse y avanzar en su puesto profesional dentro de su profesión u organismo.	_____	_____	_____
5. Habilidad de la Escuela en preparar recursos humanos para las necesidades de América Latina.	_____	_____	_____
6. Habilidad de la Escuela en desarrollar una mística de trabajo, puntualidad y otros atributos que se adquieren en el ambiente del Zamorano.	_____	_____	_____

APPENDIX B

Supply and Demand Projections by Ag Sector -- Zamorano Employers

Interview Schedule #1
Zamorang Employer

Table 2.1 Current Employment, Projected Employment and Perceived Supply By Academic Training Level for Employees in * (1) AG. PRODUCTION Businesses or Agencies.

	Current Employees		Projected Employment		No. of Bus: Perceived Supply		
	(1) Av.No. per business	No. of Businesses Reporting	Av.No.	No. Reporting	Inadequate 2	Adequate 1	Surplus 3
Primary School Only	<u>37.2</u>	<u>55</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>
Secondary School	<u>33.4</u>	<u>22</u>	<u>33.8</u>	<u>27</u>	<u>4</u>	<u>21</u>	<u>8</u>
Two Year Post.Sec.	<u>1.7</u>	<u>66</u>	<u>2.2</u>	<u>67</u>	<u>4</u>	<u>41</u>	<u>5</u>
B.S. Degree Equiv.	<u>1.1</u>	<u>13</u>	<u>1.6</u>	<u>37</u>	<u>2</u>	<u>26</u>	<u>7</u>
Advanced Degree	<u>0.5</u>	<u>15</u>	<u>0.8</u>	<u>20</u>	<u>4</u>	<u>20</u>	<u>2</u>

B-1 (1) Average number is based on all businesses.

Table 2.0 All types of business
* use type of business as reported in
1.0. Change table no. to coincide with
type of business (2.1, 2.2, 2.3, etc.)

Int. Sched. #1

** Count the businesses reporting

*

Table 2.1 Current Employment, Projected Employment and Perceived Supply By Academic Training Level for Employees in * (2) AG. PROCESSING Businesses or Agencies.

	Current Employees		Projected Employment		No. of Bus: Perceived Supply		
	(1) Av. No. per business	No. of businesses Reporting	Av. No.	No. Reporting	Inadequate	Adequate	Surplus
Primary School Only	<u>75.7</u>	<u>7</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>
Secondary School	<u>2.4</u>	<u>7</u>	<u>4.1</u>	<u>7</u>	<u>1</u>	<u>3</u>	<u>0</u>
Two Year Post. Sec.	<u>2.9</u>	<u>9</u>	<u>5.5</u>	<u>10</u>	<u>1</u>	<u>6</u>	<u>0</u>
B.S. Degree Equiv.	<u>5.6</u>	<u>6</u>	<u>9.2</u>	<u>7</u>	<u>1</u>	<u>4</u>	<u>0</u>
Advanced Degree	<u>1.4</u>	<u>7</u>	<u>2.6</u>	<u>8</u>	<u>0</u>	<u>5</u>	<u>1</u>

(1) Average number is based on all businesses.

Table 2.0 All types of business
 * use type of business as reported in
 1.0. Change table no. to coincide with
 type of business (2.1, 2.2, 2.3, etc.)

Int. Sched. #1

** Count the businesses reporting

Table 2.1 Current Employment, Projected Employment and Perceived Supply By Academic Training Level for Employees in * (3) MKTING & DISTRIBUTION Businesses or Agencies.

	Current Employees		Projected Employmnt		No. of Bus:Perceived Supply		
	(1)Av.No. per Business	No. of businesses Reporting	Av.No.	No.Reporting	Inadequate	Adequate	Surplus
Primary School Only	<u>23.2</u>	<u>10</u>	<u>X</u>	<u>X</u>	<u>x</u>	<u>X</u>	<u>x</u>
Secondary School	<u>3.1</u>	<u>4</u>	<u>3.4</u>	<u>6</u>	<u>1</u>	<u>5</u>	<u>0</u>
Two Year Post.Sec.	<u>2.7</u>	<u>17</u>	<u>3.2</u>	<u>18</u>	<u>2</u>	<u>10</u>	<u>2</u>
B.S. Degree Equiv.	<u>2.0</u>	<u>9</u>	<u>2.8</u>	<u>10</u>	<u>1</u>	<u>8</u>	<u>1</u>
Advanced Degree	<u>0.5</u>	<u>7</u>	<u>0.7</u>	<u>9</u>	<u>0</u>	<u>4</u>	<u>0</u>

B-3
(1) Average number is based on all businesses.

Table 2.0 All types of business
* use type of business as reported in
1.0. Change table no. to coincide with
type of business (2.1, 2.2, 2.3, etc.)

Int. Sched. #1

** Count the businesses reporting

★

Table 2.1 Current Employment, Projected Employment and Perceived Supply By Academic Training Level for Employees in * (4) AG SUP. & SERV. Businesses or Agencies.

	Current Employees		Projected Employment		No. of Bus: Perceived Supply		
	(1) Av.No. Per Business	No. of Businesses Reporting	Av.No.	No. Reporting	Inadequate	Adequate	Surplus
Primary School Only	<u>4.8</u>	<u>8</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>
Secondary School	<u>1.6</u>	<u>6</u>	<u>2.6</u>	<u>11</u>	<u>3</u>	<u>4</u>	<u>6</u>
Two Year Post.Sec.	<u>2.4</u>	<u>16</u>	<u>3.1</u>	<u>17</u>	<u>1</u>	<u>11</u>	<u>3</u>
B.S. Degree Equiv.	<u>1.7</u>	<u>9</u>	<u>2.3</u>	<u>11</u>	<u>0</u>	<u>3</u>	<u>8</u>
Advanced Degree	<u>0.8</u>	<u>7</u>	<u>0.9</u>	<u>8</u>	<u>1</u>	<u>3</u>	<u>3</u>

B-4

(1) Average number is based on all businesses.

Table 2.0 All types of business
* use type of business as reported in
1.0. Change table no. to coincide with
type of business (2.1, 2.2, 2.3, etc.)

Int. Sched. #1

** Count the businesses reporting

Interview Schedule #1
 Zamorano Employer

*

Table 2.1 Current Employment, Projected Employment and Perceived Supply By Academic Training Level
 for Employees in * (5) FINANCE & CREDIT Businesses or Agencies.

	Current Employees		Projected Employment		No. of Bus: Perceived Supply		
	(1) Av. No. Per Business	No. of Businesses Reporting	Av. No.	No. Reporting	Inadequate	Adequate	Surplus
Primary School Only	<u>11.4</u>	<u>4</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>
Secondary School	<u>1.4</u>	<u>4</u>	<u>1.3</u>	<u>5</u>	<u>2</u>	<u>4</u>	<u>0</u>
Two Year Post.Sec.	<u>2.9</u>	<u>17</u>	<u>3.6</u>	<u>17</u>	<u>1</u>	<u>8</u>	<u>0</u>
B.S. Degree Equiv.	<u>5.5</u>	<u>15</u>	<u>7.5</u>	<u>17</u>	<u>2</u>	<u>8</u>	<u>2</u>
Advanced Degree	<u>1.0</u>	<u>8</u>	<u>1.3</u>	<u>10</u>	<u>3</u>	<u>4</u>	<u>0</u>

B-5

(1) Average number is based on all businesses.

Table 2.0 All types of business
 * use type of business as reported in
 1.0. Change table no. to coincide with
 type of business (2.1, 2.2, 2.3, etc.)

Int. Sched. #1

** Count the businesses reporting

Interview Schedule #1
 Zamorano Employer

Table 2.1 Current Employment, Projected Employment and Perceived Supply By Academic Training Level
 for Employees in * (6) EDUCATION Businesses or Agencies.

	Current Employees		Projected Employment		No. of Bus:Perceived Supply		
	(1)Av.No. Per Business	No. of Businesses Reporting	Av.No.	No.Reporting	Inadequate	Adequate	Surplus
Primary School Only	<u>5.3</u>	<u>11</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>
Secondary School	<u>1.7</u>	<u>7</u>	<u>2.0</u>	<u>7</u>	<u>1</u>	<u>7</u>	<u>2</u>
Two Year Post.Sec.	<u>3.6</u>	<u>18</u>	<u>5.6</u>	<u>19</u>	<u>1</u>	<u>16</u>	<u>2</u>
B.S. Degree Equiv.	<u>2.9</u>	<u>15</u>	<u>4.4</u>	<u>18</u>	<u>1</u>	<u>17</u>	<u>2</u>
Advanced Degree	<u>1.6</u>	<u>12</u>	<u>2.3</u>	<u>15</u>	<u>0</u>	<u>13</u>	<u>2</u>

(1) Average number is based on all businesses.

Table 2.0 All types of business
 * use type of business as reported in
 1.0. Change table no. to coincide with
 type of business (2.1, 2.2, 2.3, etc.)

Int. Sched. #1

** Count the businesses reporting

Interview Schedule #1
 Zamorano Employer

★

Table 2.1 Current Employment, Projected Employment and Perceived Supply By Academic Training Level
 for Employees in ★ (7) GOVT. AGENCY Businesses or Agencies.

	Current Employees		Projected Employment		No. of Bus: Perceived Supply		
	(1) Av. No. Per Business	No. of Businesses Reporting	Av. No.	No. Reporting	Inadequate	Adequate	Surplus
Primary School Only	<u>17.2</u>	<u>17</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>
Secondary School	<u>7.6</u>	<u>22</u>	<u>3.0</u>	<u>44</u>	<u>0</u>	<u>20</u>	<u>0</u>
Two Year Post.Sec.	<u>11.5</u>	<u>37</u>	<u>16.4</u>	<u>37</u>	<u>2</u>	<u>26</u>	<u>2</u>
B.S. Degree Equiv.	<u>11.7</u>	<u>39</u>	<u>15.4</u>	<u>43</u>	<u>1</u>	<u>30</u>	<u>1</u>
Advanced Degree	<u>2.5</u>	<u>25</u>	<u>4.4</u>	<u>29</u>	<u>3</u>	<u>22</u>	<u>0</u>

(1) Average number is based on all businesses.

Table 2.0 All types of business
 * use type of business as reported in
 1.0. Change table no. to coincide with
 type of business (2.1, 2.2, 2.3, etc.)

Int. Sched. #1

** Count the businesses reporting

APPENDIX C

Ratings of Personal Attributes by Industry Segment

*
 Table 4.1 Employer Rating of Personal Attributes of EAP Graduates Compared to Other Employees.
 In * AG PRODUCTION Businesses or Agencies

Attribute	No. of Businesses Rating EAP Graduates As:		
	<u>Above Average</u>	<u>Average</u>	<u>Below Average</u>
Loyalty to the employer and business or agency	<u>29</u>	<u>22</u>	<u>1</u>
Positive attitude toward work of all kinds at all levels	<u>37</u>	<u>25</u>	<u>0</u>
Honesty in dealing with others	<u>37</u>	<u>24</u>	<u>1</u>
Promptness and dependability in coming to work	<u>41</u>	<u>19</u>	<u>2</u>
Self-confidence in employee's own ability	<u>36</u>	<u>25</u>	<u>1</u>
Employee's acceptance of terms, conditions, and environment of the work place	<u>32</u>	<u>24</u>	<u>6</u>
Employee's acceptance of responsibilities	<u>39</u>	<u>22</u>	<u>1</u>
Employee's willingness to work together in cooperative effort	<u>30</u>	<u>28</u>	<u>4</u>
Ability to establish and achieve goals	<u>32</u>	<u>28</u>	<u>1</u>
Average no. of businesses reporting	<u>19.4</u>	<u>24.1</u>	<u>1.8</u>

N=1

~~N~~ = 9

4.0 Total of all businesses

* Change table no. & description to coincide with bus. types from 1.0.

★
 Table 4.1 Employer Rating of Personal Attributes of EAP Graduates Compared to Other Employees.
 In ★ AG. PROCESSING Businesses or Agencies

Attribute	No. of Businesses Rating EAP Graduates As:		
	<u>Above Average</u>	<u>Average</u>	<u>Below Average</u>
Loyalty to the employer and business or agency	<u>7</u>	<u>3</u>	<u>0</u>
Positive attitude toward work of all kinds at all levels	<u>8</u>	<u>2</u>	<u>0</u>
Honesty in dealing with others	<u>8</u>	<u>2</u>	<u>0</u>
Promptness and dependability in coming to work	<u>8</u>	<u>2</u>	<u>0</u>
Self-confidence in employee's own ability	<u>7</u>	<u>3</u>	<u>0</u>
Employee's acceptance of terms, conditions, and environment of the work place	<u>8</u>	<u>2</u>	<u>0</u>
Employee's acceptance of responsibilities	<u>9</u>	<u>1</u>	<u>0</u>
Employee's willingness to work together in cooperative effort	<u>7</u>	<u>3</u>	<u>0</u>
Ability to establish and achieve goals	<u>6</u>	<u>3</u>	<u>1</u>
Average no. of businesses reporting	<u>7.5</u>	<u>2.3</u>	<u>0.1</u>

N=1
 $\sum N = 9$

4.0 Total of all businesses

* Change table no. & description to coincide with bus. types from 1.0.

★
 Table 4.1 Employer Rating of Personal Attributes of EAP Graduates Compared to Other Employees.
 In ★ MKTG & DISTRIBUTION Businesses or Agencies

Attribute	No. of Businesses Rating EAP Graduates As:		
	<u>Above Average</u>	<u>Average</u>	<u>Below Average</u>
Loyalty to the employer and business or agency	<u>7</u>	<u>9</u>	<u>1</u>
Positive attitude toward work of all kinds at all levels	<u>9</u>	<u>7</u>	<u>1</u>
Honesty in dealing with others	<u>6</u>	<u>11</u>	<u>0</u>
Promptness and dependability in coming to work	<u>10</u>	<u>6</u>	<u>1</u>
Self-confidence in employee's own ability	<u>11</u>	<u>6</u>	<u>0</u>
Employee's acceptance of terms, conditions, and environment of the work place	<u>10</u>	<u>7</u>	<u>0</u>
Employee's acceptance of responsibilities	<u>11</u>	<u>6</u>	<u>0</u>
Employee's willingness to work together in cooperative effort	<u>10</u>	<u>7</u>	<u>0</u>
Ability to establish and achieve goals	<u>10</u>	<u>7</u>	<u>0</u>
Average no. of businesses reporting	<u>9.3</u>	<u>7.3</u>	<u>0.3</u>

N=1

ΣN ÷ 9

4.0 Total of all businesses

* Change table no. & description to coincide with bus. types from 1.0.

★
 Table 4.1 Employer Rating of Personal Attributes of EAP Graduates Compared to Other Employees.
 In ★ AG. SUPPLIES & SERVICES Businesses or Agencies

Attribute	No. of Businesses Rating EAP Graduates As:		
	<u>Above Average</u>	<u>Average</u>	<u>Below Average</u>
Loyalty to the employer and business or agency	<u>9</u>	<u>8</u>	<u>0</u>
Positive attitude toward work of all kinds at all levels	<u>9</u>	<u>7</u>	<u>0</u>
Honesty in dealing with others	<u>11</u>	<u>6</u>	<u>0</u>
Promptness and dependability in coming to work	<u>10</u>	<u>7</u>	<u>0</u>
Self-confidence in employee's own ability	<u>8</u>	<u>9</u>	<u>0</u>
Employee's acceptance of terms, conditions, and environment of the work place	<u>7</u>	<u>10</u>	<u>0</u>
Employee's acceptance of responsibilities	<u>8</u>	<u>9</u>	<u>0</u>
Employee's willingness to work together in cooperative effort	<u>10</u>	<u>6</u>	<u>1</u>
Ability to establish and achieve goals	<u>6</u>	<u>9</u>	<u>2</u>
Average no. of businesses reporting	<u>8.7</u>	<u>7.9</u>	<u>0.2</u>

N=1
 $\Sigma N = 9$

4.0 Total of all businesses

* Change table no. & description to coincide with bus. types from 1.0.

★
 Table 4.1 Employer Rating of Personal Attributes of EAP Graduates Compared to Other Employees.
 In ★ FINANCE & CREDIT Businesses or Agencies

Attribute	No. of Businesses Rating EAP Graduates As:		
	<u>Above Average</u>	<u>Average</u>	<u>Below Average</u>
Loyalty to the employer and business or agency	<u>7</u>	<u>11</u>	<u>1</u>
Positive attitude toward work of all kinds at all levels	<u>9</u>	<u>9</u>	<u>1</u>
Honesty in dealing with others	<u>9</u>	<u>10</u>	<u>0</u>
Promptness and dependability in coming to work	<u>7</u>	<u>11</u>	<u>1</u>
Self-confidence in employee's own ability	<u>9</u>	<u>8</u>	<u>2</u>
Employee's acceptance of terms, conditions, and environment of the work place	<u>7</u>	<u>11</u>	<u>1</u>
Employee's acceptance of responsibilities	<u>9</u>	<u>9</u>	<u>1</u>
Employee's willingness to work together in cooperative effort	<u>9</u>	<u>8</u>	<u>2</u>
Ability to establish and achieve goals	<u>9</u>	<u>9</u>	<u>1</u>
Average no. of businesses reporting	<u>8.3</u>	<u>9.6</u>	<u>1.2</u>

N=1

ΣN ÷ 9

4.0 Total of all businesses

* Change table no. & description to coincide with bus. types from 1.0.

*

Table 4.1 Employer Rating of Personal Attributes of EAP Graduates Compared to Other Employees.
 In * EDUCATION Businesses or Agencies

Attribute	No. of Businesses Rating EAP Graduates As:		
	<u>Above Average</u>	<u>Average</u>	<u>Below Average</u>
Loyalty to the employer and business or agency	<u>10</u>	<u>9</u>	<u>0</u>
Positive attitude toward work of all kinds at all levels	<u>11</u>	<u>8</u>	<u>0</u>
Honesty in dealing with others	<u>8</u>	<u>11</u>	<u>0</u>
Promptness and dependability in coming to work	<u>12</u>	<u>6</u>	<u>1</u>
Self-confidence in employee's own ability	<u>12</u>	<u>7</u>	<u>0</u>
Employee's acceptance of terms, conditions, and environment of the work place	<u>13</u>	<u>6</u>	<u>0</u>
Employee's acceptance of responsibilities	<u>13</u>	<u>5</u>	<u>1</u>
Employee's willingness to work together in cooperative effort	<u>9</u>	<u>8</u>	<u>2</u>
Ability to establish and achieve goals	<u>11</u>	<u>7</u>	<u>1</u>
Average no. of businesses reporting	<u>11.0</u>	<u>7.4</u>	<u>0.6</u>

N=1
 $\sum N = 9$

4.0 Total of all businesses

* Change table no. & description to coincide with bus. types from 1.0.

C-6

Table 4.1 ^{*} Employer Rating of Personal Attributes of EAP Graduates Compared to Other Employees.
 In ^{*} GOV'T AGENCY Businesses or Agencies

Attribute	No. of Businesses Rating EAP Graduates As:		
	<u>Above Average</u>	<u>Average</u>	<u>Below Average</u>
Loyalty to the employer and business or agency	<u>18</u>	<u>24</u>	<u>0</u>
Positive attitude toward work of all kinds at all levels	<u>24</u>	<u>16</u>	<u>2</u>
Honesty in dealing with others	<u>22</u>	<u>19</u>	<u>0</u>
Promptness and dependability in coming to work	<u>27</u>	<u>13</u>	<u>2</u>
Self-confidence in employee's own ability	<u>26</u>	<u>16</u>	<u>0</u>
Employee's acceptance of terms, conditions, and environment of the work place	<u>19</u>	<u>21</u>	<u>0</u>
Employee's acceptance of responsibilities	<u>25</u>	<u>17</u>	<u>0</u>
Employee's willingness to work together in cooperative effort	<u>23</u>	<u>16</u>	<u>3</u>
Ability to establish and achieve goals	<u>23</u>	<u>19</u>	<u>0</u>
Average no. of businesses reporting	<u>23.0</u>	<u>17.9</u>	<u>1.0</u>

N=1
~~N~~ : 9

4.0 Total of all businesses

* Change table no. & description to coincide with bus. types from 1.0.

APPENDIX D

**Profile of 664 Employers in
Agriculturally Related Activities**

To better portray the total employment picture, and to gain insights as to the differences in structure between businesses that employ EAP graduates and those not known to employ EAP graduates, information from the two groups interviewed is combined in Appendix Tables D-1, D-2, and D-3. Categories have been collapsed for ease of presentation and interpretation of the profile of agriculturally related businesses in the countries under study.

When both groups of employers are combined, the largest proportion of businesses included in the sample are agricultural production businesses (19.9 percent) and the smallest proportion are educational agencies. Because the sampling procedure was designed to approximate a random draw from the whole population of agricultural business, it can be assumed that the proportion of total business represented by each agricultural segment in the sample approximates the proportion represented in the population.

In total, roughly half of the businesses are small (20 or fewer employees) while only 6.2 percent are large (400 or more employees). There are, however, some marked differences among the segments. Businesses in marketing and distribution, agricultural supplies and service, and finance have the largest proportion of small businesses. Educational agencies and agricultural processing firms have a majority of businesses in the mid-sized range, while agricultural production, agricultural processing and government agencies have a larger proportion of large businesses than other segments of the agricultural sector.

If part-time employees are removed from the count as shown in Table D-2, those industries that employ fairly large numbers of part-time employees appear to have a different size structure. The most noticeable differences occur in agricultural production and agricultural supplies and service categories, where the proportion of businesses classified as large declines by about 50 percent. There are corresponding increases in the percentage of businesses classified as small.

Opportunities for part-time employment occur chiefly in the segments of agricultural production, agricultural processing and education. In these segments, there is some part-time employment in all size categories. Government agencies, finance institutions, agricultural supplies and service, and marketing and distribution offer limited part-time employment opportunity.

8473A

TABLE D-1. PROFILE OF AGRICULTURAL BUSINESSES - PART-TIME EMPLOYEES

Number of Employees	Ag Production				Ag Processing				Marketing & Dist.				Ag Supplies & Ser.				Finance			Education			Govt. Agencies					
	EMP		No	Total	EMP		No	Total	EMP		No	Total	EMP		No	Total	EMP		No	Total	EMP		No	Total	EMP		No	Total
	EAP	EAP		%	EAP	EAP		%	EAP	EAP		%	EAP	EAP		%	EAP	EAP		%	EAP	EAP		%	EAP	EAP		%
	Grad	Grad			Grad	Grad			Grad	Grad			Grad	Grad			Grad	Grad			Grad	Grad			Grad	Grad		
0	47	28	75	56.4	8	51	59	73.7	18	78	96	80.7	18	68	86	82.6	18	48	66	93.0	17	31	48	73.9	43	39	82	89.1
1-10	18	13	31		0	12	12		0	15	15		1	16	17		3	2	5		5	6	11		1	6	7	
11-20	<u>2</u>	<u>1</u>	<u>3</u>		<u>1</u>	<u>3</u>	<u>4</u>		<u>0</u>	<u>3</u>	<u>3</u>		<u>0</u>	<u>0</u>	<u>0</u>		<u>0</u>	<u>0</u>	<u>0</u>		<u>1</u>	<u>1</u>	<u>2</u>		<u>0</u>	<u>2</u>	<u>2</u>	
Total	20	14	34	25.6	1	15	16	20.0	0	18	18	15.1	1	16	17	16.3	3	2	5	7.0	6	7	13	20.0	1	8	9	9.8
21-50	4	2	6		1	1	2		0	3	3		0	1	1		0	0	0		0	2	2		0	1	1	
51-400	<u>7</u>	<u>2</u>	<u>9</u>		<u>0</u>	<u>1</u>	<u>1</u>		<u>0</u>	<u>1</u>	<u>1</u>		<u>0</u>	<u>0</u>	<u>0</u>		<u>0</u>	<u>0</u>	<u>0</u>		<u>0</u>	<u>1</u>	<u>1</u>		<u>0</u>	<u>0</u>	<u>0</u>	
Total	11	4	15	11.3	1	2	3	3.8	0	4	4	3.4	0	1	1	0.1	0	0	0	0	0	3	3	4.6	0	1	1	1.1
401	<u>5</u>	<u>4</u>	<u>9</u>		<u>1</u>	<u>1</u>	<u>2</u>		<u>1</u>	<u>0</u>	<u>1</u>		<u>0</u>	<u>0</u>	<u>0</u>		<u>0</u>	<u>0</u>	<u>0</u>		<u>0</u>	<u>1</u>	<u>1</u>		<u>0</u>	<u>0</u>	<u>0</u>	
Total			133				80				119				104				71				65				92	

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TABLE D-2. PROFILE OF AGRICULTURAL BUSINESSES - FULL-TIME EMPLOYEES (664 BUSINESSES REPORTING)

Number of Employees	Ag Production				Ag Processing				Marketing & Dist.				Ag Supplies & Ser.				Finance				Education				Govt. Agencies			
	EMP		No Total		EMP		No Total		EMP		No Total		EMP		No Total		EMP		No Total		EMP		No Total		EMP		No Total	
	EAP	EAP		%	EAP	EAP		%	EAP	EAP		%	EAP	EAP		%	EAP	EAP		%	EAP	EAP		%	EAP	EAP		%
	Grad	Grad			Grad	Grad			Grad	Grad			Grad	Grad			Grad	Grad			Grad	Grad			Grad	Grad		
1-10	28	14	42		0	17	17		5	40	45		3	54	57		8	22	30		8	14	22		13	10	23	
11-20	16	6	22		1	11	12		7	26	33		3	11	14		4	7	11		6	7	13		11	8	19	
Total Small	44	20	64	48.1	1	28	29	36.3	12	66	78	65.6	6	65	71	68.3	12	29	41	57.7	14	21	35	53.0	24	18	42	45.7
21-50	15	11	26		3	16	19		4	17	21		8	9	17		4	10	14		8	9	19		9	9	18	
51-400	18	17	35		6	21	27		2	15	17		4	10	14		5	9	14		2	9	11		8	17	25	
Total Midsized	33	28	61	45.9	9	37	46	57.5	6	32	38	31.9	12	19	31	29.8	9	19	28	39.4	10	18	28	42.4	17	26	43	46.7
400 or more	6	2	8		1	4	5		1	2	3		1	1	2		0	2	2		0	3	3		3	4	7	
Total Large	6	2	8	6.0	1	4	5	6.2	1	2	3	2.5	1	1	2	1.9	0	2	2	2.8	0	3	3	4.6	3	4	7	7.6
Total All			133				80				119				104				71				66				92	
% of Bus. in sample			19.3				12.0				17.9				15.7				11.3				9.9				13.9	

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TABLE D-3. PROFILE OF AGRICULTURAL BUSINESSES - TOTAL EMPLOYEES

Number of Employees	Ag Production				Ag Processing				Marketing & Dist.				Ag Supplies & Ser.				Finance				Education				Govt. Agencies			
	EMP		No Total		EMP		No Total		EMP		No Total		EMP		No Total		EMP		No Total		EMP		No Total		EMP		No Total	
	EAP	EAP		%	EAP	EAP		%	EAP	EAP		%	EAP	EAP		%	EAP	EAP		%	EAP	EAP		%	EAP	EAP		%
	Grad	Grad			Grad	Grad			Grad	Grad			Grad	Grad			Grad	Grad			Grad	Grad			Grad	Grad		
1-10	21	12	33		0	12	12		5	38	43		3	51	54		8	22	30		6	9	15		13	9	22	
11-20	<u>17</u>	<u>5</u>	<u>22</u>		<u>1</u>	<u>14</u>	<u>15</u>		<u>7</u>	<u>23</u>	<u>30</u>		<u>3</u>	<u>12</u>	<u>15</u>		<u>4</u>	<u>7</u>	<u>11</u>		<u>6</u>	<u>8</u>	<u>14</u>		<u>11</u>	<u>8</u>	<u>19</u>	
Total Small	38	17	55	41.4	1	26	27	33.8	12	61	73	61.3	6	63	69	64.5	12	29	41	57.8	12	17	29	43.9	24	17	41	44.6
21-50	15	10	25		3	16	19		4	21	25		8	11	19		4	10	14		10	13	23		9	9	18	
51-400	<u>20</u>	<u>18</u>	<u>38</u>		<u>6</u>	<u>22</u>	<u>28</u>		<u>1</u>	<u>16</u>	<u>17</u>		<u>4</u>	<u>10</u>	<u>14</u>		<u>5</u>	<u>9</u>	<u>14</u>		<u>2</u>	<u>9</u>	<u>11</u>		<u>8</u>	<u>18</u>	<u>26</u>	
Total Mid-sized	35	28	63	47.4	9	38	47	58.8	5	37	42	35.3	12	21	33	30.8	9	19	28	39.4	12	22	34	51.5	17	27	44	47.8
400 or more	<u>10</u>	<u>5</u>	<u>15</u>		<u>1</u>	<u>5</u>	<u>6</u>		<u>2</u>	<u>2</u>	<u>4</u>		<u>1</u>	<u>4</u>	<u>5</u>		<u>0</u>	<u>2</u>	<u>2</u>		<u>0</u>	<u>3</u>	<u>3</u>		<u>3</u>	<u>4</u>	<u>7</u>	
Total Large	10	5	15	11.2	1	5	6	7.4	2	2	4	3.4	1	4	5	4.7	0	2	2	2.8	0	3	3	4.6	3	4	7	7.6
Total All	83	50	133		11	69	80		19	100	119		19	88	107		21	50	71		24	42	66		44	48	92	
% of Bus. in sample			19.9				12.0				17.8				16.0				10.6				9.9				13.8	

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APPENDIX E

**Supply and Demand Projections --
Employment by Industry**

TABLE E-1. EMPLOYMENT OF NON-ZAMORANO EMPLOYERS BY INDUSTRY

	Two-Year Post Secondary			Percent of Total Job Increase	B.S. Degree Equivalent			Percent of Total Job Increase
	Current <u>a/</u>	Future <u>b/</u>	Increase		Current <u>a/</u>	Future <u>b/</u>	Increase	
Ag Production	16.0	60.9	44.9	6.55	60.0	90.0	30.0	5.20
Ag Processing	62.7	249.6	186.9	27.30	75.6	121.8	46.2	8.01
Marketing & Distribution	21.0	83.2	62.2	9.08	133.3	216.6	83.3	14.44
Ag Suppliers & Services	75.9	152.0	76.1	11.10	46.8	74.8	28.0	4.85
Finance & Credit	43.7	125.8	82.1	11.98	99.0	214.6	115.6	20.03
Education	137.7	213.9	76.2	11.12	174.8	252.3	77.5	13.43
Government Agency	<u>165.0</u>	<u>321.9</u>	<u>156.9</u>	<u>22.90</u>	<u>498.8</u>	<u>695.2</u>	<u>196.4</u>	<u>34.04</u>
TOTAL	522.0	1,207.3	685.3	100.00	1,088.3	1,665.3	577.0	100.00

a/ Mid-1985b/ Approximately 3-7 years

8485A

TABLE E-2. EMPLOYMENT OF ZAMORANO EMPLOYERS BY INDUSTRY

	Two-Year Post Secondary			Percent of Total Job Increase	B.S. Degree Equivalent			Percent of Total Job Increase
	Current <u>a/</u>	Future <u>b/</u>	Increase		Current <u>a/</u>	Future <u>b/</u>	Increase	
Ag Production	112.2	147.4	35.2	10.80	14.3	59.2	44.9	11.75
Ag Processing	26.1	55.0	28.9	8.90	33.6	64.4	30.8	8.06
Marketing & Distribution	45.9	57.6	11.7	3.60	18.0	28.0	10.0	2.61
Ag Supplies & Services	38.4	52.7	14.3	4.40	15.3	25.3	10.0	2.61
Finance & Credit	49.3	61.2	11.9	3.70	82.5	127.5	45.0	11.77
Education	64.8	106.4	41.6	12.80	43.5	79.2	35.7	9.34
Government Agency	<u>425.5</u>	<u>606.8</u>	<u>181.3</u>	<u>55.80</u>	<u>456.3</u>	<u>662.2</u>	<u>205.9</u>	<u>53.86</u>
	762.2	1,087.1	324.9	100.00	663.5	1,045.8	382.3	100.00

a/ Mid-1985

b/ Approximately 3-7 years

8485A

TABLE E-3. EMPLOYMENT BY INDUSTRY: ALL EMPLOYERS

	Two-Year Post Secondary			Percent of Total Job Increase	B.S. Degree Equivalent			Percent of Total Job Increase
	Current <u>a/</u>	Future <u>b/</u>	Increase		Current <u>a/</u>	Future <u>b/</u>	Increase	
Ag Production	128.2	208.3	80.1	7.92	74.3	149.2	74.9	7.80
Ag Processing	88.8	304.6	215.8	21.36	109.2	186.2	77.0	8.02
Marketing & Distribution	66.9	140.8	73.9	7.31	151.3	244.6	93.3	9.72
Ag Supplies & Services	114.3	204.7	90.4	8.94	62.1	100.1	38.0	3.96
Finance & Credit	93.0	187.0	94.0	9.30	181.5	342.1	160.6	16.74
Education	202.5	320.3	117.8	11.66	218.3	331.5	113.2	11.80
Government Agency	<u>590.5</u>	<u>928.7</u>	<u>338.2</u>	<u>33.47</u>	<u>955.1</u>	<u>1,357.4</u>	<u>402.3</u>	<u>41.93</u>
TOTAL	1,284.2	2,294.4	1,010.2	100.00	1,751.8	2,711.1	959.3	100.00

a/ Mid-1985b/ Approximately 3-7 years

8485A

APPENDIX F

Interview Guidelines

for

Survey of Institutions

APPENDIX F

INTERVIEW GUIDELINES FOR
SURVEY OF INSTITUTIONS

1. Date/Location:

March 17-19 - Quito, Ecuador

Contact: Dr. Gerardo Naranjo, Dean, Agriculture Faculty,
National University

Dr. Naranjo, Dean of Agriculture for the National University located in Quito, is an agricultural educator with excellent credentials and reputation in South America, particularly the Andean region.

Purpose and Outline:

- a. Become acquainted more fully with programs producing agriculture professionals in Ecuador and the National University in particular.
- b. Gain information from other information sources on future manpower needs in agriculture. DCA has several other contacts.
- c. Collect any published data/information available for literature review.
- d. Contact interviewers (Esteban and Isabel) in Quito.
- e. Contact Quito EAP Chapter President and stimulate return of graduate survey forms.

2. Date/Location:

Guayaquil, Ecuador - March 19-20

Contacts: The following contacts listed above are EAP graduates, attended EAP graduation last December, and are acquaintances of DCA. All are anxious to assist with the study.

Mr. Laniado, Minister of Agriculture
Mr. Mauricio Laniado, merchant and son
of Minister of Agriculture
Mr. Rodolfo Avambulo, agribusinessman
Mr. Hugo Alban, Agribusinessman

Purpose and Outline:

- a. Gain manpower information/future needs/and related data from the Minister of Agriculture and close associates.
- b. Through contacts, gain access to agriculture faculty and dean, University of Guayaquil.
- c. Contact Mr. David Daines, employed by Continental Grains in Guayaquil. Daines is a close personal friend with significant information on agriculture manpower needs, deficiencies, etc.
- d. Collect pertinent written information/data.
- e. Contact Interviewer (Carlos) in Guayaquil area.

3. Date/Location:

March 21-22 - Monterrey, Mexico

Contact: Mr. Eddie Delgado -- friend of Frank
Bendana and graduate of Monterrey Technical Institute

Purpose and Outline:

- a. Visit and become acquainted with the agriculture programs of the Monterrey Technological Institute, which enjoys an excellent reputation throughout Latin America.
- b. Acquire manpower data and other published information.
- c. Ascertain opinions concerning EAP graduate's qualifications, professional status, and academic preparation.

4. Date/Location:

March 18-20 - San Jose, Costa Rica

Contacts: Dr. Samuel Stone
Dr. Luis Carlos Gonzalez, Dean, College of
Agriculture, University of Costa Rica

Purpose and Outline:

- a. Through contacts, acquire information about the proposed new school to be located in Costa Rica, what curricula is contemplated, projected numbers of students, etc.
- b. Discuss with Dr. Stone, EAP Board of Directors and EAP graduates, their professional opinions concerning the new school, the future demand for EAP graduates in the region; also to ascertain their opinions of EAP graduate's professional status and qualifications in the job market.
- c. Collect published information on manpower needs/assessments which may be available.
- d. Contact and follow-up with Costa Rican interviewers. If personal visits are not possible, telephone contact will be made.
- e. Contact EAP Chapter leadership in country and stimulate additional returns of graduate survey.

General Purpose

The travel serves several important functions vis-a-vis the EAP study. It is also necessary to examine some institutions other than EAP, to make observations about their programs and how they compare to EAP. Visits with these institutions provide first-hand knowledge of significant value to the overall study. The travel is designed to accomplish the following:

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