

# ESCUELA AGRICOLA PANAMERICANA

Tegucigalpa, Honduras

ANNUAL REPORT 1987



## CHAIRMAN'S REPORT 1987

During the last decade Zamorano has made spectacular advances. The student body and staff have more than doubled their size while the standard of teaching has improved, as evidenced by the high quality of our graduating classes. Women now form an increasing proportion of our student body and the first Ingenieros Agrónomos will be graduating in April 1988, after a fourth year of studies to complement the traditional three years leading to the Agrónomo degree. The high quality of our staff shows in the increasing number of post graduate degrees that appear in the faculty list toward the end of this Annual Report.

The production of the school farm has greatly increased over the same period. The farms are the source of practical experience for the student body and supply food for the school dining hall. Surplus production of certain items provides income to cover part of the operating costs of the institution.

Teaching and farming are complemented by new research programs of a practical nature in areas such as pests and diseases in crops, bean and sorghum production, grass and forage crops, water buffalos and forestry management. These research projects stimulate teachers and benefit from the active participation of the students.

All this expansion of teaching, production and research has necessitated a large building program including not only new student dormitories and staff residences but also new laboratories and classrooms, the enlargement of the dining hall and the library as well a host of other specialized buildings. Old timers will not feel out of place because the architectural integrity of the campus has been preserved and even large new buildings such as the slaughter house, the milk processing plant and a two-level dormitory do not appear out of place among the original buildings conceived more than forty years ago.

New land has been acquired to protect the school from encroachment by land developers and squatters as well as to protect and increase sources of water. Water supply for crop irrigation could become a limiting factor in the future development of the school.

The funding necessary to support all this increased activity has largely kept up with expenditures, causing only small and manageable deficits from time to time. However, the Board is concerned that some of the sources of funding do not help to guarantee the future financial independence of the school. Income from the endowment fund and other sources directly controlled by the school, account for less than half of the total funding.

The Board is therefor now guiding the school towards a period of consolidation of past gains, of strengthening of management and of the creation of a solid base on which to build future advances. Also during 1988 an active fund-raising campaign will be organized to increase the endowment fund. A grant expected from the Honduran government and the United States Agency for International Development will stimulate matching funds from private and corporate donors.



Morán, Mario  
Narváez, Ramón  
Nufio, Mario  
O'Connell, Gilbert E.  
Olaechea, Javier  
Oster, Merrill  
Oyuela, Rivaldo  
Palomo, José  
Popenoe, Hugh  
Putnam, George E.  
Quiroz, Armando  
Rockefeller, Rodman  
Román, Jorge  
Rosengarten Jr., Frederic  
Rucks, Pablo  
Sawyer, Raymond M.  
Segovia, José  
Sempé, Roberto  
Smathers Jr., Frank  
Smith, John G.  
Thomas, S. Alexander  
Varela, Hugo  
Weeks, John W.  
Williams, Emilio  
Wills, Manuel  
Wright, Burke

### Government Groups

ASHA/USAID (American Schools  
and Hospitals Abroad)  
German Foundation for International  
Development (DSE)  
German Ministry for Economic  
Cooperation (BMZ)  
Government of Belize  
Government of El Salvador  
Government of Great Britain  
Government of Honduras  
Interamerican Development Bank (IDB)  
USAID Mission to Ecuador  
USAID Mission to Honduras  
USAID Mission to Panama  
USAID/ROCAP

### EAP Alumni Association

AGEAP International  
AGEAP by Country



# **ESCUELA AGRICOLA PANAMERICANA, INC.** **STATEMENT OF REVENUES AND EXPENSES-OPERATING FUND**

(Expressed in 000'S U. S. Dollars)

(Condensed Financial Statement derived from Audit  
 by Mendieta & Associates. Representatives of  
 Arthur Young & Company)

REVENUES	1987	1988
Endowment Income	500.	500
Gifts and Grants	1,135	1,644
Matriculation Fees	2,526	1,296
Sale of Farm Products/Services	1,579	1,609
Internally Produced Actives	<u>538</u>	<u>647</u>
<u>Total</u>	6,278	5,696
EXPENSES		
Departaments, Education	4,217	3,675
Operacion and Maintenance	1,188	1,101
Administration and institutional	<u>997</u>	<u>880</u>
<u>Total</u>	6,402	5,656
(Deficit)	(124)	40

## **NONDISCRIMINATORY POLICY**

Escuela Agrícola Panamericana admits students of any race, color, national and ethnic origin to all the rights, privileges, programs and activities generally accorded or made available to students at the School. It does not discriminate of the basis of race, color, national and ethnic origin in administration of its educational policies, admissions policies, scholarships and loan programs, and athletic and other school administered programs.

The outstanding progress in the school's activities mentioned in this report has been largely initiated and totally executed by Director Simón Malo and his staff. The Board thanks this dedicated group of men and women for their contribution to the advancement of the school as the leading center of agricultural education in the tropics.

We record with sadness the death on December 15, 1987 of Mr. G. Burke Wright. Since joining the Board in 1977 Burke Wright had labored hard, long and concientiously on all the projects assigned to him. His devotion to the school, his hard work and cheerful presence at Board meetings will be greatly missed.



John G. Smith  
President



## DIRECTOR'S MESSAGE

The flow of accomplishments in institutions is never uniform throughout the years but tends to come in jerky motions, in peaks and valleys. Sometimes it occurs in unexpected ways, with surprising results, impacting on aspects of the program for which no one was ready. Problems, present for many years, find a sudden solution but allow others to surface along with new challenges and opportunities.

Institutions are people and reflect, in great measure, their strengths and weaknesses, their ideals and aspirations. Zamorano is a concentration of applied biologists who are well read and travelled individuals, conscious of world food problems and the constant specter of hunger and disease caused by today's exploding population in the tropics. We are close to people who constantly feel the impact of mankind's oldest and most merciless enemy: physical hunger. This keeps us alert and motivated, always striving to shape future events and society through the new generations of young men and women. Admittedly, our level of idealism is high with respect to the rest of society, aspiring to a world not only without hunger but with abundant food for everyone and a superior quality of life, in all its civilized aspects.

The special nature and rigor of our agricultural school point to the fact that a firm hand is needed in guiding its destinies. A steadfast resolve and persistence are qualities to be maintained and encouraged. This is particularly true for our complex organization and intensive, disciplined tempo. Zamorano works as a teaching-research center and, simultaneously, as a large farm operation, largely based on student labor and professors' supervision.

We have an outstanding faculty and dedicated personnel. Our Board of Directors is a source of strength and inspiration. They are responsible for the characteristic stability of Zamorano through the years, in a region where very few, if any institution, enjoy our continuity to achieve excellence. After 46 years of existence, I am the seventh director and the first who is a graduate of the school and a product of its educational principles. We are proud that while the majority of world agricultural colleges have tended to become more theoretical than before, we have intensified and improved the hands-on philosophy of our first founding director, Wilson Popenoe. Learning by doing has been expanded and refined, challenging even further the intellectual and physical capabilities of our students. This leads to a high quality graduate who is capable of solving complex problems in the field.

### Some noteworthy accomplishments for 1987 are:

1. The fourth year program was initiated in April, increasing the student body to 530. Initial results appear better than expected. In addition to required course work, students conduct supervised research in a variety of disciplines. The



## DESCRIPTION OF THE INSTITUCION AND ITS MISSION

Escuela Agrícola Panamericana, better known as "Zamorano" because of the traditional name of the farm where it is located, is a private, international college, established in 1941 with the authorization and support of the Government of Honduras. It is incorporated in the State of Delaware as a charitable institution and enjoys non-profit tax advantages both in the U. S. and Honduras. The school is located 25 miles east of Tegucigalpa in the picturesque Valley of the Yeguaré River. Because of the altitude (800 m), the year-round weather conditions are pleasant and represent an average climate of the countries where the international student body comes from. It is excellent for both agriculture and animal husbandry, and thus ideally suited for teaching agriculture and conducting research on a wide variety of tropical crops and problems. The actual property of the institute spans over 12,000 acres of land of many types including rain forests in the higher areas. A large variety of plant species from lowland, humid areas on up to the cold Andean-type areas in the higher reaches of Mount Uyuca expose the student to a wide range of agriculture.

In the realm of agricultural education, Zamorano is unique in the world. It is one of the few that operates as a university-level teaching center within the confines of a large commercial farming operation. Students learn-by-doing from professors and instructors who teach-by-doing under a code of strict discipline and hard work for everyone. These efforts result in substantial food production which supports the college population of a thousand people. The surplus is sold to help finance the operation of the institution.

The annual program begins the first week of January and continues through the end of November, leaving the month of December as the annual vacation for everyone. The academic year is divided into three trimesters, and the "Agronomo" program, which is the first degree offered, consists of nine trimesters totalling 33 months. The "Ingeniero Agronomo" program is the second degree offered and comprises 12 trimesters with a total of 44 months. The first program is comprehensive, giving the agronomo an excellent foundation in tropical agriculture. The second program becomes more specialized. It delves deeper into modern agricultural science and stresses research and individual work.

The students participate in a great variety of projects which range from administration and management with the use of computers, to programs of basic seed, vegetable, and fruit production, and processing of all kinds of animal products and food technology. The students "learn by doing" with their hands, working 24 hour per week in all the school programs. The "modules" of field laboratory work, something unique to Zamorano, consist of 3-week assignments in specific production operations. The farming organization of the School is divided into approximately 45 different "modules", all dealing with the agricultural

operation of the institution. Twenty five weekly hours are devoted to classroom teaching or laboratory exercises in 76 compulsory and elective courses. A fourth-year student will be guided and supervised by a committee of the faculty which sets goals and assignments and controls the progress of the student.

The pace of study and work is intensive and designed to concentrate far more learning into a shorter span of time than is usual at other institutions. The results are excellent, producing top quality professionals in a relatively short time with the characteristic Zamorano habit of hard work, integrity and discipline. The professional records of the majority of "Zamoranos" attest eloquently to the benefits of our hands-on program. The list of alumni includes Ministers and Vice Ministers of Agriculture, Finance and Education, Presidents and Deans of Colleges, Directors of a variety of institutions and many prominent businessmen such as Presidents of Banks and Cooperatives. The majority were poor but motivated students who began at the bottom of their professions and climbed the ladder through their own merits and efforts. The unique contribution of Escuela Agrícola Panamericana to the manpower development of Latin America has had a significant impact on agricultural development since 1946 when the first class graduated.

Zamorano accepts high school graduates, men and women, from countries in the western hemisphere who can pass an entrance examination in Spanish and who show need and motivation to study practical hands-on agriculture. As in all modern private institutions, tuition has been adjusted to reflect costs and inflation. Student's fees and scholarships contributed by international agencies and dedicated individuals continue to be the principal source of income. Although the level of tuition may appear to represent a hardship to many qualified students, EAP has a generous scholarship program to ensure that deserving applicants are not excluded for financial reasons.

Zamorano is widely recognized today as the college with the highest standards in tropical America. This is the result of an unparalleled history of stability and continuity. The School does not depend on any government and is not subjected to the whims of world politics. Donations from private individuals and corporations are actively sought primarily to support the scholarship program for very poor students. Contributions are tax deductible in the United States and Honduras. Donors may address contributions to Director, Escuela Agrícola Panamericana, P.O. Box 93, Tegucigalpa, Honduras, or to Bank of Boston, 100 Federal St., Boston, MA. 02110. Attention Mrs. Gunnel de Perez. International Officer. Checks should be made payable to Escuela Agrícola Panamericana.



## STUDENT BODY AND FACULTY

The year of 1987 was started with 472 students in the Agrónomo program; 216 in first year, 142 in second, and 114 in third. Of these, 146 are Hondurans; 130 from the Central American countries, including Belize and Panama; 190 from South America; 2 each from Mexico and from the Caribbean; and one each from Spain and from the United States. Since 1986, we have admitted slightly over 200 students into first year, and this is a desirable figure to maintain. The percentage of graduates in relation to new students has stayed the same since the founding of E.A.P., but it must be observed that 20 per cent of our graduates are concentrated in the last five years, because graduating classes have been over 100-strong since 1983. The class of 1987 had 110 students, of which 12 were women. There are a total of 38 women graduates since their first arrival in 1981, and their numbers increase each year. In due time, women are expected to represent 25 per cent of the student body. The school considers their academic performance, always on equal terms with male students, to be quite as good and productive.

Our faculty is also increasing due to the demands of a larger student body and the initiation of the fourth year. The careful screening of competent professionals and the constant upgrading of the faculty's academic levels, guarantee that Zamorano's "learning by doing" continues to be the logical result of "teaching by doing". Education, research and farm production are all an integral part of the school's program.

### FOURTH YEAR

After several years of planning, the fourth year was initiated in April 1987, with 56 Agrónomos from seven countries. They work toward the degree of Bachelor of Science in Tropical Agriculture ("Ingeniero Agrónomo"). It requires the completion of three academic periods totalling 48 credits. Students may specialize in Animal Science, Agricultural Economics, or Plant Science (Agronomy or Horticulture, or Plant Protection. A thesis covering original research must be presented and defended at a seminar. Our first class of "Ingenieros Agrónomos" will graduate in April of 1988.

### DEPARTMENTS: "AGRONOMO" PROGRAM

The number of theory classes offered in the first three years were increased to 76. Field practices (modules) are 45, and the students cover 15 per year. They are assigned to the departments of horticulture, agronomy and animal sciences during the first, second and third year, respectively. The departments of plant protection and of agricultural economics collaborate and support the efforts of the others. Biology and basic sciences covers courses such as chemistry, mathematics, English, botany and other foundation subjects. Following are more details under the heading of each department.

## AGRICULTURAL ECONOMICS AND AGRIBUSINESS

When the fourth year was established, this department started growing remarkably fast, especially in the areas of teaching and research. During 1987, courses offered were increased to 25; they are taught by 12 professors of different fields, including two visiting professors.

Efforts have been made to adapt our field practices to classroom teachings, in accordance with E.A.P.'s traditional methodology of learning by doing. There is a complete list of practices for the second, third and fourth years. Those in second year include budget preparation; follow-up, control and evaluation of each student's independent production project (PPI), and the design of an experiment. In third year, practices are oriented to cost accounting, preparation and evaluation of complete agricultural projects, and agribusiness management.

Of special significance are 12 research projects conducted by fourth year students and their advisors, to be finished by April 1988 and presented at a seminar that marks the end of the school year for these students at the "Ingeniero Agrónomo" level.

The Computer Center for teaching is part of this department, and strives to satisfy the increasing demand in the use of microcomputers. The Introduction course has been offered six times this year, and there is a new Applications course for fourth year.

Computing gives support to other departments; it operates a program for keeping inventory at the dairy plant, and has another for the feed concentrate plant.



## AGRONOMY

Second year students in this department go through 15 field modules during the 45 weeks of classes, performing many tasks such as the analysis of chemicals in soils samples, to the field work of detasseling female lines in hybrid corn fields or building contour terraces for hillside crops.

On Saturdays, groups of students work on the Independent Production Program (in Spanish, PPI), where they grow five basic crops (corn, sorghum, rice, beans, soybeans) in one hectare. This work, from April to November, from seed to harvest, ends with the presentation of a seminar to evaluate results. By means of this contest, and of the field modules, we complement the learning of theory in the classroom, obtaining an integral education with the discipline of hard work.

The adoption of a fourth year has stimulated research. Our 10 students in Agronomy are a part of the department's projects. Examples of subjects chosen for thesis are: drought resistance, symbiotic fixation of Nitrogen, crop fertilization, seed quality, etc. In addition to thesis and coursework, fourth year students participate in other departmental activities, and offer a contribution to the learning process of the students in lower classes.

Agronomy carries eight projects in cooperation with foreign foundations and universities. Six more are in the planning process. There are works in plant breeding, to introduce resistance to drought, diseases and storage insects; symbiotic Nitrogen fixation in legumes, and other types. The impact of these projects will be felt soon by the Honduran economy, and especially that of poor farmers, to whom we offer improved varieties of corn, maicillo criollo (sorghum) and beans. Considering the many countries of origin of our students, this impact will be felt in others; its effect will be disseminated more widely through our teaching and extension efforts.

We also work on non-traditional crops, such as amaranth, sunflower, sesame and triticale. One or more of these crops may soon contribute to bettering the region's income and food supply. Our two main extension efforts have been directed to aquaculture in the area near E.A.P. and to the integrated farm and hillside renovation.

The trend continued to increase the amount of certified seed produced. This requires carefully planned operations to guarantee quality. The student's participation is not only helpful from the educational point of view, but it is crucial for the whole process: planting, fertilization, pest control, roguing, detasseling, harvest, drying, classification, treatment and packing. By offering locally produced, quality seed to the Honduran farmer, we contribute to the welfare of this society and its import-export balance.

In spite of limitations inherent to tropical areas, such as acidic and infertile soils, with the proper management, E.A.P. has obtained good yields in several crops. We have overcome the disadvantage of shorter days during the growing season





by obtaining two crops per year. In corn, for example, we have harvested up to 14 metric tons of grain per hectare, which is an indication of what can be possible in our region.

The following table shows the 1987 production, compared to the two previous years.

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#### PRODUCTION

<u>(short tons)</u>	<u>1987</u>	<u>1986</u>	<u>1985</u>
<u>GRAIN</u>			
Maíze	458.9	354.2	168.5
Sorghum	313.6	488.6	245.7
Rice	47.1	24.2	125.2
Beans	2.2*	18.4	26.5
Soybean	**	10.1	7.9
<u>SEEDS</u>			
Maíze	343.2	50.6	45.0
Sorghum	132.1	28.8	13.3
Rice	47.3	10.2	8.0
Beans	5.4	4.4	4.3
Soybean	0.8	1.0	1.2
<u>OTHER</u>			
Fish (Tilapia)	3.89	3.97	2.5
Shrimp	0.10***	0.36	0.40

\* Bean production was affected by severe drought

\*\* Soybean production was reduced because of lack of adequate varieties

\*\*\* Shrimp production was lower because of lack of spawn

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## ANIMAL SCIENCE

Animal Science started 1987 with 114 third-year students, graduating 110 "Agrónomos." Sixteen 4th-year students specialized here, and 15 are expected to graduate in April 1988 with the "Ingeniero Agrónomo" degree.

Research. The subjects of 15 4th-year thesis. Categories: 1) Forage production; (grass-legume associations). 2) Forage utilization, on beef, dairy cattle, and sheep. 3) Non-ruminants; on poultry and on swine. 4) Production index evaluation, on milking herds, and on double-purpose herds in Olancho. 5) Double-purpose cattle; on calf rearing, and on feed supplements of producing cows. 6) Reproductive physiology; on estrus synchronization and reproduction of beef cows. 7) Rural development; effect of introducing goats in rural communities for diet improvement. Other projects: nutritional value of African oil palm, in cooperation with a privately-owned firm; results of feeding high levels of molasses in finishing swine; the effect of supplementing selenium and vitamin E on placenta retention in dairy cows.

Production. Thirty per cent was for students' dining hall, and 70% for sale. Main products are: 1) dairy, 2) meats 3) poultry and 4) other products, such as sires for beef and dairy bovines, swine, sheep and goats, concentrate feeds, hides, lard, etc.

### SECTIONS

Animal Nutrition Laboratory. Fourth-year students learned about feed analysis; the Van Soest method: organic matter digestibility in forages, using the ruminal fluid. This lab is capable of giving support to: Agronomy to determine nutritional value of crops for genetic selection; tannin content in sorghums; carotenoid pigments (provitamin A) in sweet potatoes; the nutritional status of rural inhabitants for Rural Development.

Forages. Introduced species of tropical legumes and grasses for the teaching collection, crossing and hybridation of Pennisetum, forage seed, and large scale plantings of legumes and grasses.

Beef Cattle. Acquisition of a Brahman bull with 10 cows, and a Beefmaster bull. Remarkable improvement of reproductive efficiency of the herds has been achieved. Improvement of pastures with Digitaria and Pennisetum, reducing finishing time by three or four months.

Dairy Cattle, Sheep and Goats. Milk production decreased in the dry season due to insufficient rains; we have continued selling breeding males of cattle, sheep and goats, and soon we will have enough for female sales again. Twenty one goats were used for studies in rural communities, in collaboration with Partners of the Americas.

Swine. Four new piggeries were finished, where 50 breeding sows and their litters are housed. Reproductive efficiency has improved, but it is not enough to keep up with demand from breeders and school's needs for meat.

Water buffaloes and double-purpose cattle. All cows have produced at least one calf per year, with extremely low mortality. We hope to have a herd of 100 animals early in 1988. In 1987 they produced over 19,000 liters of milk (used for "Zamorella" cheese), the same amount of milk as produced by the double-purpose herd. Double-purpose, Holstein X Brahman, cows are being studied in a separate herd in cooperation with the Agricultural Credit Unit of the Central Bank of Honduras.

Poultry. produced 72 tons of broilers, 5.32 of turkey meat, and over 40,000 dozen eggs. This production, however, still does not satisfy the global needs of our institution.

Animal Health. Our veterinarian gives service to all departments and the slaughterhouse for inspections.

Concentrate feeds. Produced 1200 metric tons of feed for swine, bovines, sheep, goats, poultry, buffaloes, and others.

Dairy. Building of the new plant/laboratory has been finished, and equipment is being installed. Meanwhile, the old plant processed two million pounds of milk into pasteurized milk, plain and flavored; several kinds of cream, ice-cream and yoghurt; fifteen kinds of cheese; butter and milk sweets.

Meat Processing. The new plant was inaugurated in March, and it is working efficiently. Its use has increased production by 71% in comparison with 1985 levels.

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## ANIMAL SCIENCE PRODUCTION 1987

PRODUCTION	1987	1986	1985
Eggs (dozens)	40,223	56,223	53,818
Cow's milk (liters)	575,508	583,102	553,818
Goat's milk (lt.)	29,787	22,313	26,348
Water buffalo milk (lt.)	19,422	14,539	1,755
Ice cream (lt.)	36,966	32,193	27,923
Butter (short tons)	5.40	10	4
Cheese (ton.)	74	92	72
Beef (ton.)	176	122	88
Pork (ton.)	86	69	65
Poultry meat (ton.)	77	75	37

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The "Kellogg Center" is under construction at Zamorano's campus. This facility will provide classrooms and housing for trainees of an ambitious short course program which is an important component of the Integrated Rural Development Program. Thirty two technical courses have been identified by Zamorano's staff, in agricultural economics, agronomy, animal science, fish culture, forestry, horticulture and plant protection. These practical courses of one to two weeks are targeted to extensionists working in rural development throughout the region. Courses are also being prepared for farmer audiences. We would like to express our gratitude to the Kellogg Foundation and the Interamerican Foundation for their support of this short course program.

## DEVELOPMENT AND PLANNING

This department contributes to teaching, and is in charge of new constructions and renovations, land surveying and other engineering operations.

In 1987, the following were completed: two stables for calves; four piggeries for breeding, maternity, weaning and finishing; slaughterhouse and meat processing; dairy laboratory with new refrigerated rooms; a biogas generator, to utilize manure from water buffaloes; Diagnosis Center and Plant Protection; Apiculture and horticultural Post Harvest treatment; The George Washington dormitory for fourth year; four new residences; two renovated residences; two additional wings for the library; land surveying of Rapaco farm lands.

Work was started on the "W.R. Kellogg Rural Development Center," which should be finished in mid-1988; offices for Horticulture; Food Technology labs; labs and processing unit for Aquaculture; biological control lab; open auditorium for 500 students; and a small bank building. Under design: new sheds for machinery and supplies; a "International Seed and Grain Science Center," including laboratories, offices, and processing plants. Renovation of old buildings is being initiated.



The Diagnostic Center has a "dirty lab" to receive and prepare field samples; a "clean" room; an isolations room with growth chambers, and a screen house for raising pests. Here we raise, mount, preserve, label and identify noxious organisms from all over Central America. Users are farmers, extensionists and scientists.

The Agroecologic Inventory Center is more than an agricultural museum. It holds collections of organisms and computers to catalog the information. Users are foreign and E.A.P. scientists, and post-graduate students.

Although this project is starting, its boundaries are practically infinite. By using its data and services, which are of local origin and orientation, users will be able to produce more food and fiber for the whole region, and thus contribute to its well-being and stability.

## RURAL DEVELOPMENT

The Integrated Rural Development Program, initiated with funding from the W. K. Kellogg Foundation in February 1987, has already had significant impact at Zamorano and in poor rural communities in Honduras. This program has two goals: to contribute a component of agricultural communication and outreach methodology to the School's traditional training objectives and to improve living conditions of rural communities in tropical America.

As a result of this program, courses in extension methodology and rural sociology are offered to third and fourth year students, respectively. All second year students participate in the three-week extension module in which they work on a hillside farm typical of small agricultural enterprises in the region; they conduct research surveys in surrounding campesino communities; construct and evaluate farm equipment for the transfer of appropriate technology; and share their ideas and expertise with youth centers, schools, and orphanages within close range of the School. Eleven fourth year students are basing their thesis on extension projects organized in collaboration with the rural development program. These projects incorporate a farming systems approach to on-site, field research leading to results which will assist the small farmer by introducing different species, new cultivars, improved techniques, and plant protection. Conferences and seminars on rural development issues have been organized at the School, with the participation of students and staff.

An outreach and short course program has been integrated with educational activities. Recent Zamorano graduates are living in three distinct agricultural zones in Honduras. They work with small farmers to increase the production of vegetables, fruit, grains, fish, poultry and livestock; and to improve storage, processing and marketing techniques. The "agronomos" provide training for the communities, introduce technology such as simple water pumps, conduct research in collaboration with farmers, and are stressing the importance of concerns such as agroecology, reforestation and watershed management through innovative educational activities in local schools comparable to FFA and 4-H projects.