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in

Hervieu B. (ed.).
Agronomic training in countries of the Mediterranean region

Montpellier : CIHEAM
Options Méditerranéennes : Série Etudes; n. 1988-II

1988
pages 187-193

Article available on line / Article disponible en ligne à l'adresse :

<http://om.ciheam.org/article.php?IDPDF=CI020387>

To cite this article / Pour citer cet article

Mut Català M. **Education at the Saragossa Mediterranean Agronomic Institute**. In : Hervieu B. (ed.). *Agronomic training in countries of the Mediterranean region*. Montpellier : CIHEAM, 1988. p. 187-193 (Options Méditerranéennes : Série Etudes; n. 1988-II)



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Education at the Saragossa Mediterranean Agronomic Institute

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The educational objectives of the Saragossa Mediterranean Agronomic Institute (S-MAI) were defined by the Founding Act of ICAMAS in 1962. This agreement set forth the wish to establish, in the field of higher agricultural education, strong collaboration among Mediterranean countries based on common geological, geographical, climatic and human foundations, and to train the specialists that are necessary for the development of agriculture in these countries, through complementary higher education given by internationally known professors.

I - Current organization

Throughout its existence, the S-MAI has been entrusted by the ICAMAS Board of Directors with developing certain activities in various sectors of agriculture: hortofruiticulture, viticulture, animal production, rural planning in conjunction with the environment, genetic plant improvement and seed production, marketing agricultural products, etc. In all of these sectors, that were considered priorities for Mediterranean agriculture, the Institute developed specialist training programs. In order to establish these

training programs and to evaluate them, *ad hoc* groups of experts occasionally make the necessary changes to adapt their content to the purpose, while taking into account scientific and technical evolution. The course programs as well as the list of professors are approved by the Board of Directors of ICAMAS after a preliminary examination by the Advisory Committee.

Two types of courses have been organized: specialized courses, which normally last one academic year, and monographic courses, that last one to four weeks to bring specialists up to date on particular topics. These training activities are complemented by courses that are organized at the request of institutions in member or non-member countries, in order to try to respond to existing needs. Furthermore, seminars and other complementary activities are also organized.

The Center's vocation is to encourage cooperation among member and associated countries, as well as with non-member countries. We have thus always tried to have students from different countries, since this makes it possible to establish ties that favour a spirit of cooperation. Pursuant to the Act, teachers come from different countries, and this helps the students to draw greater

benefits from the experiences and results of different schools.

The experience acquired over the years shows us that course participants highly appreciate this type of relationship, both with the students and with the teachers.

The total number of students who have participated in S-MAI courses is 1,773.

1. Specialization courses

The purpose of these specialization courses is to train specialists in a specific area.

Throughout the existence of S-MAI, courses of this type have been organized on the following:

- Hortofruiculture
- Animal production
- Genetics, nutrition and animal reproduction*
- Genetic plant improvement and seed production*
- Rural environmental planning*
- Marketing agricultural products*

These courses have been organized every year, although those that are presently taking place (indicated by asterisks) will henceforth be organized every two years.

Applicants must be university graduates. Because of this, and as is stipulated in the Agreement, these courses are designed to complement those given in the universities of member countries.

In order that professionals interested in certain specific topics of the program may attend certain courses, they have been divided into cycles so that teaching on such topics is concentrated in a short a period of time. This is the reason why the number of participants in the courses is variable, because professionals participate in a fixed number of cycles. In the past few years, this partial participation has increased, and we can say that many government employees from the agricultural extension services have attended certain cycles.

At the end of the courses, after having passed the appropriate tests, students may obtain the Center's post-graduate Specialization Diploma.

As a complement to training activities, students who have obtained the post-graduate Specialization Diploma with the best grades may pursue a research project during the second year in the research departments that cooperate with the Center. After having presented their results in public, in front of a jury of professors and researchers, these students obtain the Center's Diploma, which is equivalent to the master's degree. This diploma, as well as the preceding ones, is quoted in the text of the ICAMAS Founding Act, and is therefore recognized by member countries that have signed this agreement.

The purpose of this activity is to give those students who wish to pursue this type of work in their country of origin an initiation to research.

The fact that these research activities are not conducted at the Institute, but in collaboration with member countries' research centers, emphasizes the policy of encouraging cooperation among the future specialists of Mediterranean countries.

The number of ICAMAS diplomas given so far at the Institute is very limited - only 21 - since this activity began only in 1980, and also because there was strict selection in the choice of students to be admitted for this type of work. At the present time 40 students are pursuing their work towards the international Center's diploma.

2. Monographic courses

The monographic courses are designed for professionals, and their purpose is to improve and update their knowledge of concrete topics. To date, 574 students from 30 countries have participated in the Institute's monographic courses.

These courses are not given on a regular basis and have dealt with extremely different topics. Without wanting to be exhaustive, the Institute has given seminars on company management, market analysis, sugar-beet crop-farming, genetics and improvement of the sugar-beet, statistics and experience analysis, sugar technology, plastic materials used in horticulture,

human nutrition and agricultural production, diseases of the sugar-beet, the study and recognition of weeds, applying herbicides, applying international standards to fresh apples, pears and citrus fruit, the valorization of agrarian residues, and on limnology and aquaculture.

These courses normally last three to four weeks.

In certain cases, still in pursuance of the Center's basic vocation to encourage international cooperation, these courses were jointly organized with other international organizations. For example, the courses on Sugar-beet were conducted in collaboration with the IIRB (International Institute for Research on the Sugar-beet); the course on the Harmonization of Legislation on Seed-fruit and Citrus fruit was conducted in collaboration with the OECD; and the course on the Valorization of Agrarian Residues with the Council of Europe.

3. Other courses

Independently of the courses conducted at the request of the Board of Directors, *ad hoc* courses were organized at the request of institutions in Mediterranean countries, and their programs always responded to the needs of these institutions. Sometimes, ICAMAS asked the country having requested the course to admit students from other countries.

Two courses of this type were organized. The first, at the request of the Spanish Ministry of Agriculture, was for training Cooperative Managers and it took place as part of the course on the Management and Conduct of Agricultural Enterprises. It was given for four years in a row, from 1971 to 1976, and 100 graduates, almost all of them Spanish, participated.

The second course was organized in 1978 to train students of the Mostaganem Agricultural Technological Institute in animal production, at the request of the Algerian Ministry of Agriculture.

Fourteen Algerian students attended this course and 12 of them obtained the Institute's diploma. Ten of them eventually obtained a doctorate after having completed work at the University of Toulouse.

4. Symposiums and seminars

As a complement to training activities, seminars and symposiums are organized on particular topics that concern the Mediterranean region. An example was the Roundtable organized in collaboration with the International Ecological Society (INTECOL) in January 1984 on the "Limits of agricultural production", in which prestigious economists and agronomists from European and American countries participated.

In this chapter, and in collaboration with AIDA (Interprofessional Association for Agricultural Development) - an association that takes in a large part of the Institute's former students - Study Days are organized every year on concrete topics, to bring our former students as well as other interested professionals up to date.

II - Future organization of teaching at the S-MAI

We think that teaching at the S-MAI has been useful for students who followed the courses, both in specializations where there is the possibility of conducting a research project (master's option), and the monographic courses.

If one wants these courses to be useful in the future, the principle of the Center's founding act will have to be taken into account. In other words, this should be a complementary factor to what is taught in the universities of member countries. If teaching in our universities evolves, ours will also have to evolve in order to preserve this complementarity and in order to really be of a post-graduate level.

Throughout the 25 years that have gone by since the Center was founded, teaching in our universities has changed. It has become more specialized because of the increase in scientific knowledge and because of the need to respond to the current demand for professionals who are specialized in concrete topics, without losing sight of necessary general knowledge which constitutes the basis of a profession.

If specialization in universities corresponds to an increase in scientific knowledge, it should be understood that the rapid evolution of this

knowledge requires frequent updating, and that in many cases universities are not able to do this. Hence the need to increase the number of very specialized and short monographic courses that address either professionals (in education, research, agricultural development) or students.

The Secretary General of ICAMAS, in a document presented to the Board of Directors meeting held in Tunis (64/CA(86)1), suggested that the number of monographic courses be increased, since these courses would fill an existing gap and would not compete with national systems.

In order that the content of these monographic courses may be highly specialized and useful, they will have to be organized in collaboration with

universities in member countries. First of all, to avoid repetition, and secondly, so that these monographic courses serve as a meeting place for teachers and participants. Indeed, scientific knowledge increasingly requires closer collaboration among researchers if it is to progress. Thus the Center's objective must be to teach developing science, and not that which is already known.

In order to follow this policy, the S-MAI is preparing a series of monographic courses in the different specialities that are presently the object of training programs. This way, for each activity, a specialization course will be taught every two years, and will alternate with a monographic course related to the speciality.

Annex Specialized courses

Horticulture and fruiticulture

This course has been given every year from 1964 to 1976. 260 students participated, 234 of them being Spanish and the rest from 15 different countries. Since the Saragossa Institute was not recognized as an ICAMAS Institute until 1970, almost all the students were Spanish during the first years.

This was the first course organized in Saragossa that complied with the wish to stimulate the horticultural and fruit sector, the program of which includes both the technical and economic aspects of production.

Viticulture

From 1973 to 1975, the S-MAI organized three courses in collaboration with the International Office of Vineyards and Wine (OIV) and the OECD; these itinerant courses on viticulture lasted four months, during which participants successively moved within the viticultural and wine-growing regions of Spain, France and Switzerland, and, for the first course, Hungary.

68 students from Germany, Algeria, Chile, Cyprus, Spain, the U.S.A., France, Greece, Hungary, Italy, Mexico and Tunisia, participated in these courses.

Animal production

This course has been organized since 1967, and 467 students from 32 different countries have participated in it. During the first ten years, the objective of the course on animal production was training in the technical and economic aspects of cattle stock production. Given the development and evolution of countries, the improved level of training and the technicality of agriculture, this single course was replaced in 1977 by two different

courses, the Technical course, and the course on Specialization in Animal Production. These courses are repeated every second year.

The technical course on animal production, which will take place in the 1986/1987 academic year, is essentially of a technical nature and aimed at training and updating livestock farming. It is divided into seven cycles focusing on "Pastures and fodder", "Sheep and goat production", "Economy applied to ruminant husbandry", "Rabbit production", "Cattle production, meat and milk", "Pig-farming", "Avicultural production". During this course, students must complete a monographic project on a concrete topic of their choice.

The specialization course on animal production includes three different courses aimed at completing and updating researchers' and teachers' knowledge in the following subjects: "Genetic improvement of animals", "Animal feeding and nutrition", and "Reproduction". These courses take place respectively during the first, second and third academic quarters. Few students take the entire three courses, since the topics are highly specialized. The number of researchers and university professors signed up for one of these three courses is high, which is very significant. The course on Genetic Animal Improvement took place from September to December 1987; the course on Animal Feeding and Nutrition from January to March 1987, and the one on Reproduction from April to June 1987. These three courses will again be organized in two years, during the 1989/1990 academic year.

Rural planning in conjunction with the environment

This course came into being because of the currently felt need not to project rural planning exclusively in economic terms. Experiments in

Spain and other Mediterranean countries have shown that rural planning was conducted with the sole preoccupation of solving agrarian production and social problems (transformation into irrigated land and apportioning plots among farmers). Consequently, this point of view had to be complemented from the viewpoint of the physical planning of natural resources, with better coordination between various public institutions in each country, regarding their role in rural zones. These preoccupations were collected, so to speak, during a first meeting of experts organized by the OECD in order to examine the possibility of organizing a course on rural planning, its social, ecological and economic aspects.

The purpose of this course therefore responds to the need to promote better use of rural space in Mediterranean countries, as well as better use of its natural and human resources. This course is devised to train specialists in rural planning who plan rational use of natural and human resources while avoiding the degradation of rural spaces which is going on in our Mediterranean countries, from both the ecological and the sociological points of view.

This course aims to contribute elements that are indispensable for understanding the characteristics of various natural and rural ecosystems, more or less humanized, and the basic problems tied to the management of natural resources, by using systems analysis. That is why it includes different notions that concern both the natural and human sciences.

During the first quarter, studies deal with the inventory of natural resources (cycle on physical geography), the criteria for alternative use of these resources (cycle on ecology), the inventory of human resources (cycle on sociology), as well as the bases for an alternative use of natural and human resources in regional development from the human standpoint (cycle on regional economy). Given the Institute's agricultural vocation, there also is a cycle on agro-ecology which analyses the impact of agricultural activity on rural planning.

During the second quarter, the question of techniques in connection with rural planning is taken up. These studies begin by a basic cycle focusing on system analysis, which allows the participants to become more familiar with the

modelling techniques aimed at analyzing variations in natural and human resources. Integrated land use planning as a limiting factor is then studied (cycle on land use planning), as well as "water management" from the point of view of its alternative use in stable societies (cycle on water use). The quarter is completed by studies on problems derived from industrial activity in rural development and its repercussions on the environment (cycle on rural industrial development), as well as a last cycle for evaluating repercussions on the environment. This last cycle analyses the social costs derived from activities related to transportation, communication, tourism, agro-industrial methods and activities, by comparing them with benefits they provide.

The last quarter is exclusively reserved for the preparation of a final study on integrated planning, on the basis of certain pre-defined zones, on which the participants, divided into several groups, have worked throughout the course.

This course was taken by 198 students from 93 different countries.

Genetic plant improvement and seed production

The increase in the population and of the standard of living in countries of the Mediterranean area has forced researchers to look for methods of increasing yield in plant production. One of the main processes consists of selecting and improving native varieties which, as they are best adapted to our ecological systems, offer the best prospects for a modern type of agriculture. For these reasons, the Institute began training on the topic of Genetic Plant Improvement and Seed Production.

The course is divided into three main cycles that spread over approximately all three academic quarters. The first cycle focuses on basic Genetic Plant Improvement, the second on Applied Genetic Improvement for plants that are most interesting for the Mediterranean region from the economic point of view; and the third cycle deals with Production and Marketing of Seeds.

This course began in 1982/1983 and was taken by 108 students from 12 countries.

Marketing agricultural and food products

The Board of Directors recently requested the S-MAI to organize a course on marketing agrarian products. The program of this course has already been written up by the corresponding *ad hoc* group, and was approved by the Board. It will begin to be organized in October 1987.

The reason which prompted the Board of Directors to start on the activity of marketing agrarian food products was the need to provide the Mediterranean region with a better organization of commercial structures, both from the standpoint of public administration and from that of the marketing enterprises themselves - as they are necessary for the development of agriculture in member countries.