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Liacos L., Papanastasis V., Sficas A.

in

Casas J. (ed.).
Agricultural research in countries of the Mediterranean region

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

1988
pages 47-59

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This report includes material presented in three separate papers at Istanbul by Professors Liacos, Papanastasis and Sficas on agricultural research in Greece dealing respectively with veterinary medicine, forestry and the remaining scientific sectors. It should be noted that this report is now of only historic interest as in December 1986 agricultural research conducted under the authority of the Ministry of Agriculture (as we will see, the lion's share) was the subject of a reform which replaced the many institutions described below with a single agency.

Agricultural research in Greece officially began in 1923, although some research projects started in 1901 with the foundation of the Soil and Fertilizer Institute. From 1923 to 1938 the most important crop research institutes of the country were founded (cereals, tobacco, cotton, raisins), as well as three plant protection institutes and the Institute of Agricultural Products Technology.

In 1946, immediately after the Second World War, the Institute of Forage Crops was founded. Seven other institutes (including four horticultural crops) and 30 regional research stations were founded after 1961. In recent years there has only been some administrative re-organization which has not really changed the structure and especially the objectives of these research institutes.

Agricultural research in Greece is currently the responsibility of the Ministry of Agriculture to which nearly all agricultural research institutes belong directly or indirectly (autonomous institutes). Agricultural research projects are also carried out by the two university schools of agriculture (Athens and Thessaloniki) with financial support coming mainly from the Ministry of Agriculture. In fact, whether at the Ministry of Agriculture or the two universities, agricultural research in Greece can be divided into the following three main fields: 1) agricultural research in general, covering all scientific areas, except forestry, veterinary studies, fisheries and rural sociology and economics; 2) forestry research; and 3) veterinary research.

I - Agricultural research (excluding forestry and veterinary studies)

This research is done by 24 research institutes that report to the Agricultural Research Service of the Ministry of Agriculture. Also involved are the following independent institutions: Benaki Phytopathological Institute, Democritus Nuclear Centre and agricultural organizations (Hellenic Cotton Board, Sugar Industry) that participate in research projects related to their main interests in development and appplication. The two university schools (Athens and Thessaloniki) also contribute actively to agricultural research.

We will first present the different institutions according to their geographic location and main

research areas. After a brief overview of the relations between them, we will describe the role of the Ministry of Agriculture's Agricultural Research Service and then give some data on the human, financial and material resources that are used.

1. Institutes

A. Geographical organization

For the coordination of agricultural research in Greece, the country has been divided into five districts, each of which has an Agricultural Research Centre (ARC).

(1) Northern Greece ARC (Thessaloniki)

This centre includes eight institutes and nine research stations, namely:

1.1. Cereals Institute (Thessaloniki)

1.2. Cotton and Industrial Crops Institute (Sindos, Thessaloniki)

1.3. Institute of Deciduous Trees (Naoussa)

1.4. Plant Protection Institute (Thessaloniki)

1.5. Soil Science Institute (Thessaloniki)

1.6. Institute of Land Reclamation (Sindos, Thessaloniki)

1.7. Institute of Animal Production (Yanitsa)

1.8. Institute of Crop Control

As a branch of the National Tobacco Board there is also:

1.9 Tobacco Institute (Drama), with six research stations (Xanthi, Kozani, Thessaloniki, Katerini, Karditsa, Agrinion).

As a branch of the Hellenic Sugar Industry there is the:

1.10. Sugar Research Service (Thessaloniki)

1.11. At the University of Thessaloniki the following departments of the School of Agriculture are engaged in agricultural research activities, often in cooperation with the Agricultural Institutes of the Ministry of Agriculture: Plant Science; Animal Science; Agricultural Economics; Soil Science; Irrigation; Land Reclamation and Agricultural Engineering; and Food Science and Technology of Agricultural Products.

Nine regional research stations (RS) are located in the following cities in northern Greece: Orestias, Komotini, Xanthi, Serres, Drama, Moudania (Chalkidiki), Ptolemais, Kozani and Ioannina.

(2) Central Greece ARC (Larissa)

This centre includes the following three institutes and two research stations:

2.1. Institute of Legumes, Forage Crops and Pastures (Larissa).

2.2. Institute of Plant Protection (Volos).

2.3. Institute of Soil Mapping and Classification (Larissa).

The two research stations are located in Vardates (Phthiotis) and Palama (Karditsa).

(3) Athens ARC

Five institutes and two research stations belong to the Athens ARC, namely:

3.1. Institute of Agricultural Products Technology (Lycovrisi. Attiki).

3.2. Wine Institute (Lycovrisi, Attiki).

3.3. Soil Science Institute (Lycovrisi, Attiki).

3.4. Viticulture Institute (Lycovrisi, Attiki).

3.5. Institute of Agricultural Machinery and Construction (Agii Anargyri, Attiki).

The following agencies also operate under the supervision of the Ministry of Agriculture:

3.6. Benaki Phytopathological Institute (Kiffisia).

3.7. Hellenic Cotton Board (Athens) (Part of its research work is done in its laboratories and regional offices).

3.8. School of Agriculture (Athens). (Same departments as at the University of Thessaloniki, School of Agriculture).

The research stations are located in Aliartos (Viotia) and Ag. Stefanos (Attiki).

(4) Peloponissos and Epirus ARC (Patra)

The following five institutes and five research stations belong to this centre:

4.1. Institute of Vines and Horticultural Crops (Pyrgos).

4.2. Institute of Olive Trees and Horticultural Crops (Kalamata).

4.3. Institute of Citrus Trees (Nauplion).

4.4. Institute of Olive Trees (Kurfu).

4.5. Institute of Plant Protection (Patra).

The five research stations are located in Ioannina, Arta, Amalias, Skala (Lakonia), and Tripolis.

(5) Crete and the Islands ARC (Chania)

Three institutes in Chania and six research stations belong to this centre.

5.1. Institute of Subtropical Crops and Olive Trees.

5.2. Institute of Vines, Legumes and Ornamental Plants.

5.3. Institute of Plant Protection.

Four research stations are located in Crete (Heraclion, Ierapetra, Messara, Rethymno), one in Mytilini and one in Rhodes.

B. Classification by subject

(The codes following each subject refer to those used to identifiy the institutes described above.)

a) Plant Production

General subjects

Soils and fertilizers: A 1.5, A 2.3, A 3.3

Irrigation and land reclamation: A 1.6

Mechanization: A 3.5

Plant Protection: A 1.4, A 2.2, A 3.6, A 4.5, A 5.3

Various departments and/or laboratories of the two agricultural schools are also studying similar research subjects. Furthermore, all specialized crop institutes are dealing with applied research problems concerning manuring and irrigation techniques, mechanization and plant protection methods.

Specific crops

Cereals: A 1.1

Forage crops and pastures: A 2.1 - A department in the School of Forestry and the Forestry Research Institutes are pursuing research on pastures in marginal lands.

Cotton and oleaginous crops: A 1.2 and the research laboratories of the Hellenic Cotton Board.

Tobacco: A 1.9

Sugar beets: A 1.10

Aromatic plants: in the Northern Greece ARC, the Department of Aromatic Plants.

Vegetables: A 4.1, A 4.2, A 5.2 - Also a department of the Northern Greece ARC.

Deciduous fruit trees: A 1.3

Olive trees: A 4.2, A 4.4, A 5.1

Citrus trees and sub-tropical crops: A 4.3, A 4.1, A 5.1

Vines: A 4.1, A 5.2

Ornamentals: A 5.1

Various departments and/or laboratories of the two agricultural schools perform research independently and/or in cooperation with the specialized institutes.

The local research stations in the various districts of the country are participating in projects planned by the specialized institutes of the Agricultural Research Centres. These projects are usually of mainly local interest. The majority of the research stations are not specialized by crops, but they concentrate their research on crops of major importance for the district, nearly always

under the supervision of the principal institutions.

The Institute of Crop Cultivar control (A 1.8) performs its cultivar tests in its own installations or in cooperation with the specialized institutes.

b) Animal Production

Animal Breeding and Production: A 1.7. The Animal Science Departments of the Schools of Agriculture undertake research programs independently or in cooperation with the Institute. Many research stations all over Greece participate in the realization of such programs. Some regional research stations are exclusively or mostly devoted to animal production (Moudania Chalkidiki, Koila Kozani, Drama and others).

c)Agricultural Crops Technology

Technology in general: A 3.1

Wines: A 3.2 and also the Vine Institutes A 3.4, A 4.1, A 5.2

Olives and olive oil: A 4.2, A 4.4 (A 3.1)

Vegetable oil: A 1.2 (A 3.1)

Cereal products: A 1.1 (A 3.1)

Sugar industry: A 1.10

Cotton: A 1.2 and the Hellenic Cotton Board

Tobacco: A 1.9

Animal products : A 1.7, A 3.1, Animal science and food science departments of the two Schools of Agriculture.

For oils, wines and the canning industry there are also the food science departments of the two Schools of Agriculture.

Fruit and vegetable technology problems are dealt with by the horticultural institutes.

Hygiene problems of animal products (meat and milk products) are dealt with by the School of Veterinary Science, University of Thessaloniki.

All departments of chemistry at the university level are occasionally involved in agricultural products research.

2. Other links of the national research system

Although most agricultural research is carried out by the pertinent institutes belonging to or supervised by the Ministry of Agriculture, there are strong links with other related training and extension institutions throughout the country:

a) University departments and school laboratories (mainly of the forestry and agricultural schools) carry out research projects, either independently or in cooperation with agricultural institutes. Faculty members participate in various committees in research planning, project examination for financing and evaluation.

b) Other research institutions and university departments have no formal connections with agricultural research institutes but their expertise is called upon for specific problems.

The Democritus Nuclear Centre (Athens) is also contributing to agricultural research, mainly in some basic research problems.

c) With other national organizations and research institutions, there is a strong link between research and application work in many cases. In some organizations, like the Sugar Industry, National Tobacco Board, and Hellenic Cotton Board, planning and financing research is carried out in parallel with their extension and development programs.

d) The extension service of the Ministry of Agriculture assists in establishing demonstration fields with new production techniques. Cooperative organizations support research in connection with seed propagation, hybrid production and other activities. Farmers are represented in all agricultural organizations, hence their participation in research orientation is indirect through these bodies.

3. National agricultural research service

The Agricultural Research Service (to which the 24 research institutes report) consists of five directorates: Programming, Biometry and Evaluation; Plant Production and Technology; Livestock Production; Agricultural Meteorology and Ecology; Agricultural Documentation Centre.

A. Programming, biometry and evaluation

Three sections :

Programming and cooperation with university research Centres and other institutions.

Responsibilities: collection, classification and appropriate forwarding of research proposals concerning agricultural problems. Supervision of normal functioning and parallel development of the Agricultural Research Centres. Cooperation with local independent institutions, university schools and international organizations.

Biometry and evaluation of research results

Responsibilities: provide assistance to the research staff of the national institutions concerning planning of experiments and statistical analysis of experimental data. Review of scientific papers and supervision of publication and distribution. Organization of seminars and training programs.

Financial services

Responsibilities: supervision of the budget of the research institutions and the formalities of funding the various projects.

B. Plant production and technology

Six sections:

Field Crops (cereal, forage, industrial, aromatic and pharmaceutical crops). Proposals for research on breeding, physiology, cultural practices and seed propagation, supervision and coordination of the work carried out by the pertinent research institutes. Cooperation with and support from national and international institutions and organizations.

Horticultural crops: Same as above for fruit-trees, vegetables, ornamentals and other horticultural crops.

Plant protection: Proposals and coordination of the research work of the Plant Protection Institutes.

Soil Science and Land Reclamation: Same as above for relevant institutes.

Plant and Livestock Products Technology: Same as above.

Agricultural Machinery and Construction: Same as above.

C. Livestock production

Three sections:

Ruminants: Program study, priority and coordinating actions for research on cattle, sheep and goats, among national institutes and with other local or foreign organizations.

Monogastric: Same as above for pigs, horses, poultry, rabbits, fur-bearing and other monogastric animals.

Pastures, Animal Feed, Bee Keeping and others: Same as above for the research programs on improvement and management of pastures, improvement and feeding of bees and silkworms. Also programs of livestock feeds and feeding. Coordination of programs of pertinent national institutes and cooperation with other local or international organizations.

D. Agricultural meteorology and ecology

The responsibilities assigned to the three sections are as follows:

Agrometeorology: Evaluation of meteorological data collected from the various agricultural regions of the country. Study of the effect of weather conditions on the growth and development of plants and animals and on the epidemiology of diseases and the ecology of plant pests. Also study of the techniques of plant protection from adverse weather conditions.

Bioclimatology: Research to assist in the selection of best adapted plant cultivars and animal races for the various regions of the country. Determination of zones of suitable crop production.

Environment and energy: Problems of environmental contamination from fertilizer use, agrochemicals or other chemical materials and from agricultural installations (industries, livestock). Study of alternative energy sources (sun, wind and biomass) and energy conservation in plant and livestock production techniques.

E. Agricultural documentation centre

Responsibilities: accumulation, classification and registration of scientific information on agriculture. Library organization. Cooperation with related international documentation Centres.

4. Human resources

A. Researchers and teachers

There are more that 400 full time research workers for the main institutions of the Ministry of Agriculture plus an equivalent (at half time) of about 150 more from the agricultural schools and another 30 graduate students or assistants. More than one third of them have graduate degrees (Doctorates or Masters of Science or equivalent).

The distribution of scientists by research is as follows:

- **Plant production**: about 300 scientists in research institutes and about 60 in schools of agriculture.

- **Animal production**: about 60 in research institutes and about 30 in schools of agriculture.

- **Irrigation**: about 50 in the institutes and departments of schools of agriculture.

- **Agricultural industries**: about 30 scientists in total.

- **Agricultural economics and others**: 30 scientists in the schools of agriculture

Since the salaries of educational institutions are higher, there is a continuous flow of advanced graduate degree holding scientists from research institutes to universities and advanced technical schools. New graduates are replacing them in the research institutions.

The promotion of scientists within the agricultural institutes of the Ministry of Agriculture follows the rules set up for government employees. Post-graduate degree holders are better paid and have priority for promotions. In the university schools, promotions follow competitive rules including candidacies for every vacancy, new position or qualification for personal promotion. Training, experience and number and level of scientific papers are taken into account.

Advanced degree holders (M.Sc., Ph.D.) are mainly trained in foreign countries (USA, Europe). National graduate training programs have recently been developed for a number of branches of agricultural science (Plant Breeding, Agronomy, Irrigation, Animal Husbandry, Dairy Science, etc.).

In addition to the movement of researchers to training institutions, a small number of graduates remain in the country performing advanced studies. Some researchers move to other positions (mainly administrative) but in general the loss is not considered very important.

B. Other staff members

Technicians and workers: Laboratory and field technicians employed by the agricultural institutes are limited in number and training. The older ones usually have no training background and qualify by their long experience. Specialized workers are more numerous and are employed for specific tasks, totalling about 1,000 per year.

Specialized engineers or high level technicians are very few, work in central specialized institutions, and occasionally assist in the work of regional research Centres.

Administrative staff: Directors of institutions are older, experienced scientists, often appointed through promotion from the research staff.

Accountants, assistants and secretaries are rather numerous (nearly twice the number of scientists). Most of them hold a high school diploma.

5. Material resources

Experimental fields

Research institutes and regional research stations all own adequate land for their experimental work. Occasionally they may rent field space in areas where no regional stations exist and for cooperation with farmers for specific tests and demonstration plots. The same holds true for seed propagation and hybrid crop seed production, although part of this work is done by cooperatives.

Equipment and services

Office, laboratory and warehouse space is also available, and is generally sufficient for nearly all institutions and research stations. Agricultural machinery and other implements for field work are also available.

Scientific instruments, especially modern and expensive ones, are lacking in many institutions. In remote institutions, some expensive equipment, even when installed, is difficult to operate and maintain due to the lack of technicians and to the long distances from large cities where proper facilities exist. The result is that valuable equipment is out of use for long periods. It is advisable that such equipment be installed in central institutes, from where all regional or remote ones could be serviced. There are also a few cases of expensive equipment, bought especially by university laboratories for specific projects being used for a limited time or not at all.

Publications

All institutes submit to their respective ministries annual reports concerning their research and development activities. As a result of their experimental work, data of broader interest are presented in papers read at scientific or technical meetings or sent for publication in specialized journals.

The Ministry of Agriculture regularly publishes the journal *Agricultural Research*. The School of Agriculture in Thessaloniki has an annual research publication. The Benaki Phyto-pathological Institute also has two technical journals (*Geoponika* and *Geotechnica)* which publish scientific and technical papers on agricultural subjects.

There is a tendency for papers of broader scientific interest to be sent to international specialized journals for publication and only those of restricted or national interest are published in local periodicals. It is worth noting how the common interest achievements and cooperative work of the Mediterranean countries in the field of agricultural science and technology could be expressed through a common publication under the auspices of ICAMAS.

Financial resources

It is difficult to estimate the total amount of money spent from the national budget for the operation and maintenance of agricultural research institutions. Permanent staff (scientists and assistants) are goverment employees, paid from the national budget. The expenses for seasonal employees and workers, maintenance and material is estimated at about $4 million plus another $2 million from the national investment program for construction and equipment.

The research budget (except staff salaries) for agricultural research from the Ministry of Education is nearly non-existent. Some projects of educational institutions are financed by the Ministry of Agriculture or other sources.

There are no para-public institutions and there is no financial support in any way (contracts or otherwise) from the private sector. Aid from international organizations (e.g. FAO) is also very small and refers to a few contracts for special cases. Only the EEC has given some aid, which for this year amounted to 100,000 ECUs.

The management of available money by the various institutions, in spite of existing administrative restraints common with public money expenditure, can generally be considered as normal. Inflation, exchange restrictions and regulations are sometimes the cause of delays in the acquisition of precious scientific equipment and normal maintenance and cooperation.

II - Forest research

Forestry research in Greece aims at studying problems related to the conservation and management of forests and forest lands.

1. Institutions

All forestry research is conducted by the following public institutions:

A. Two institutions of the Ministry of Agriculture oriented mainly to applied research:

- **Forest Research Institute of Athens** which covers the forestry problems of southern Greece; and

- **Forest Research Institute of Thessaloniki** which covers the forestry problems of northern Greece.

Each institute is divided into 11 divisions which deal with specific subject areas such as: forest management and economics, silviculture and forest genetics, forest ecology and soils, forest protection, forest hydrology, wood technology, landscape architecture, range management, wildlife and fisheries, forest harvesting and populiculture.

These research institutes are independent from each other but both report to the Minister of Agriculture.

B. Department of Forestry and Natural Environment of the University of Thessaloniki with teachers devoting part of their time to mainly basic research. It is divided into five specific divisions that include broader interests than the institutes: forest production and protection of forests and the natural environment; range management and game animals; planning and management of natural resources; technical works; and wood harvesting and technology.

2. National organization of forest research

The Forest Research Institutes have no administrative connections either with the Department of Forestry at the University or with other specific non-agricultural institutions. They have, however, joint projects with university people on a basis of scientific cooperation among interested researchers. Moreover, their researchers participate actively in counselling and dissemination of research findings among extension foresters, forest workers and farmers.

Supervison work carried out in Forest Research Institutes is ensured by the Ministry of Agriculture. Within the Forest Service there is a special **Department of Forestry Research** which coordinates the two institutes and decisions regarding research problems are taken by the Minister of Agriculture. Moreover, practically all research funding comes from the forestry budget of the Ministry of Agriculture; only a small part comes from the Ministry of Research and Technology or foreign sources, e.g. EEC.

For the University Department of Forestry, funds for research come from the University budget or from external sources. The latter include the Ministry of Agriculture or the Ministry of Research and Technology as well as foreign sources, e.g. EEC. The research subjects are decided by the professors themselves. If funds come from external sources then the projects are approved by the financing source.

3. Human resources

A. Researchers and teachers

Forest Research Institutes of the Ministry of Agriculture

- Foresters with doctorate or Ph.D.:18

- Foresters with a Master's degree:10

- Foresters with two years graduate studies: 3

- Foresters without graduate studies: 8

- Other scientists (biologists, chemists):7

Total: 46

All scientists are full time researchers but they do not belong to a distinct professional category. Apart from a small bonus for those having a Ph.D. or Master's degree, their salary and social position is much lower than that of university professors but the same as administrative officials. They are recruited on the basis of their graduate studies but promoted in the same way as administrative officials. Their basic training is in the Department of Forestry of the University of Thessaloniki, but their graduate studies (mostly in the beginning of their career) are done abroad, i.e. Europe (Great Britain, Germany, France, Austria, Italy) and the USA. Due to lack of incentives, it is difficult to recruit good researchers, while quite a few of them move on to the University.

University of Thessaloniki

- Full professors (with doctorate or Ph.D.):13

- Associate professors (with doctorate or Ph.D.): 2

- Assistant professors (with doctorate or Ph.D.): 9

- Lecturers (with doctorate or Ph.D.): 9

- Teaching and research assistants (without a doctorate or Ph.D.): 22

Total: 55

All of these half-time researchers have a higher social position compared to scientists in the Forest Research Institutes. All of them have basic training in forestry in Greece while their graduate work has been done mostly abroad (Europe, USA). Their recruitment and promotion is based mainly on published papers.

4. Other Staff

Forest Research Institutes

- Forestry technicians: 26

- Laboratory technicians: 10

- Administrative staff (secretaries, draftsmen, drivers, mechanics, carpenters, janitors, etc.): 34

Total: 70

Forestry technicians are graduates of forest colleges (two to three years of study after high school), who assist in field experiments; laboratory technicians are graduates of high school or technical colleges (chemistry, electronics, etc.) and assist in laboratory experiments; the administrative staff varies in strength, from university graduates (secretaries), to technical colleges (draftsmen), to high school or even elementary school (drivers).

Other workers are hired as seasonal staff and their number varies every year. Their salary ranges from the minimum for unskilled workers to up to 70% higher depending on the competence of the individual.

University of Thessaloniki

- Laboratory technicians:15

- Secretarial staff:10

Total: 25

Both laboratory technicians and secretaries are graduates of high school or technical colleges.

5. Material and funding resources

Forest Research Institutes

1) a) Main installations:

- 0.7 ha of land with a building of 3,690 m^2 in Athens;

- 33 ha of land with a building of 3,023 m^2 (22 km SE of the city of Thessaloniki).

b - Experimental fields:

- 220 ha of land (FRI of Athens);

- 61 ha of land (FRI of Thessaloniki).

Experimental fields are essential for independent research, demonstration, forest plants, poplar cuttings and forest and range seed production. They are staffed with one superintendent and several seasonal workers.

2) Main buildings of both institutes are modern, spacious and well equipped to conduct standard soil and vegetation analyses, photosynthetic studies, forest disease and insect studies, hydrological measurements, nutritive value of forage plants and wood studies. Documentation is inadequate and thus a target for support from foreign aid.

All research results are published in *Dasike Erevna*, a two to four issue a year review in Greek with English summaries published by the Forest Research Institute in Athens. "Grey" literature is very important while publication in foreign journals is neither common nor encouraged.

3) The 1985 budget was as follows :

- 200 million drachmas for operation (50% for salaries);

- 40 million drachmas for equipment and buildings.

These funds come mainly from the Ministry of Agriculture, Ministry of Research and Technology and to a lesser degree from international aid (EEC). Financial problems exist mainly for recruiting personnel and for purchasing equipment from abroad.

University of Thessaloniki

1) Besides its building in the campus, shared with the Department of Agriculture, a new one is under construction. Also, it has two University forests of 3,300 ha (Pertuli of Thessaly) and 6,000 ha

(Taxiarchis of Halkidiki) for practicing of students and for research. In these forests, there are buildings (especially in Pertouli) of about 3,000 m^2.

2) Laboratories are equiped to conduct standard studies for plant sociology, botany, chromatography, forest insects and diseases, nutritive value of range plants, plant-water relations, forest surveys and wood properties and products. The Department issues its own annals where research work is included.

3. The financial means for research are meagre and they come from University sources, from the Ministry of Agriculture, Ministry of Research and Technology and the EEC.

6. Research programs and results

Forest Research Institutes

1) Subjects or problems of forestry to be researched are suggested by the extension foresters or the researchers themselves, since most of them have worked or are in touch with the extension service, or by sections of the Ministry of Agriculture. All these suggestions are evaluated by the Department of Forestry Research in the Ministry of Agriculture with the assistance of experts and the final decision is taken by the Minister of Agriculture.

2) This evaluation process also applies to the specific programs after their detailed description and justification by the researcher or team of researchers.

3) Socio-economic goals have much more weight in deciding about the research programs than gaining knowledge *per se*.

4) External sponsoring basically provides the means for the themes chosen as priorities by the national authorities.

5) Research budgets are allocated more on the basis of results than the status of researchers.

6) All scientists work for forest production, except three who also work on animal production (rangelands).

7) Afforestation of Mediterranean dry lands, range management (sylvopastoral management) and watershed management are some important themes for cooperation with ICAMAS.

University of Thessaloniki

For the University, research orientations are decided by the professors themselves to meet mainly scientific targets. But for the projects financed by other than University sources the decision and evaluation process is about the same as the one described previously. Research results strongly affect the promotion of the teacher. Among scientists, at least six work in the interface between forest and animal production.

III - Veterinary research

This research is done by institutions that report to the Ministry of Agriculture and the Veterinary School at the University of Thessaloniki.

1. The 20 institutions of the Ministry of Agriculture are the folowing:

- Veterinary Institute of Infectious and Parasitic Diseases, Attica;

- Veterinary Institute of Physiopathology, Reproduction and Animal Nutrition, Attica;

- Veterinary Institute of Hygiene and Food Technology, Botanicos;

- Veterinary Institute of Thessaloniki;

- Artificial Insemination Technology and Reproduction Diseases Centre of Athens, Botanicos;

- Artificial Insemination and Reproduction Diseases Centre of Diavata, Thessaloniki;

13 Veterinary Laboratories located in Larissa, Ioannina, Patras, Komotini, Chania, Chalkis, Kavala, Serres, Iraklio, Kozani, Lamia, Tripolis, and Rhodos; and:

- Veterinary Laboratory of Medicine Control and Biological Products, Attica.

The objectives of the veterinary doctors who work at these Veterinary Research Institutions are:

- diagnosis of diseases;

- food control of animal origin;

- production of vaccines, sperm, serums; and

- control of animal nutrition and veterinary research which occupies staff members for 10-20% of their time.

The equipment of the institutions is generally satisfactory. The equipment of the new regional laboratories will be completed with the expansion of their activities and their housing problems will be solved.

The scientific staff of the Veterinary Institutions (total: 122) which has taken post-graduate education in different fields is shown in **Table 1**.

2. University of Thessaloniki Veterinary School

Laboratories fully equipped with instruments and sufficient staff are operated by competent professors at the Veterinary School of Aristotelion University of Thessaloniki for all subjects of Veterinary Science.

IV - National research programs and results

1. Orientations

The Ministry of Agriculture, in cooperation with a special service of the Ministry of Research and Technology develops the research orientations. Researchers participate directly (through committees) or indirectly (by submitting research proposals) in the country's research orientation. Final approval is obtained by the responsible political authorities, after the proposals of an *ad hoc* committee, whose members are University professors and administrators (scientists coming from the research community).

The latest orientation plan for agricultural research for the period 1984-1987 covers the sectors of Agriculture, Forestry, Veterinary Medicine and Fisheries.

2. Definition of programs

The various research institutions are aware of the practical and urgent problems in their fields of responsibility and are informed about the policy followed by the Ministry of Agriculture. Specialized teams prepare the research projects for each institution. The directors of the institutes submit these projects to the Ministry for approval, after discussion in a meeting with participants from all sides (institutions, Ministry, planning committee).

In the university schools, programs are prepared and submitted to similar committees only for funding purposes. Grants are usually available for projects that conform with the general orientations set up by the planning committee.

3. Type or nature of research

Since funds are nearly always limited, most of research projects are directed towards the solution of urgent and practical problems (socio-economic). Investigations of scientific interest are carried out in projects where such an affinity exists. In many cases (especially dissertation work) in academic laboratories and in a few institutions (e.g. Democritus Nuclear Centre, Benaki Phyto-pathological Institute) some effort is devoted to basic research targets.

4. External sponsoring of research

The proportion of funds other than that of the national budget for agricultural research is very small. There has recently been some support from EEC funds for projects of immediate interest for the country and the community. Specific projects are sometimes partly financed by other sources (FAO, various foreign or private grants), but their relative contribution is still insignificant.

5. Evaluation of results

There is no specific procedure for evaluating the results of research or research teams in Greece. Every institute prepares an annual report of its work, in which the results of all research projects are presented. When a program is finished, publication in local or foreign scientific journals is proposed.

The research accomplishments of each institute are usually taken into account for future research orientation and the allotment of material means. Researchers are also credited with their specific achievements, which are considered for further promotion.

Table 1:
Scientific personnel of veterinary institutions of the Ministry of Agriculture

Speciality	Service	Doctorate	Masters	+ 12 mos.	+ 6 mos.	- 6 mos.	Total
1	2	3	4	5	6	7	8
Microbiology	1	6	6	3	3	-	19
Virology	-	4	-	2	2	-	8
Parasitology	-	1	-	1	-	1	3
Entomology	-	-	-	-1	-	-	1
Epidemiology	-	-	-	-	-	-	-
Production of biological products	-	-	-	1	2	-	3
Raising of laboratory animals	-	-	-	-	-	-	-
Food hygiene technology	2	5	10	4	1	1	23
Fish hygiene technology	-	-	-	1	-	-	1
Milk production hygiene technol.	-	-	1	1	2	-	4
Bovine clinical pathology	-	-	-	-	-	-	-
Porcine clinical pathology	-	-	-	2	-	-	2
Ruminants clinical pathology	-	-	-	1	-	-	1
Small livestock clinical pathology	1	-	-	-	-	-	1
Poultry clinical pathology	2	1	-	5	1	-	9
Fish clinical pathology	-	2	-	1	-	-	3
Bee clinical pathology	1	-	-	-	3	-	4
Zootechnology	-	3	-	1	-	-	4
Livestock metabolic diseases	-	1	1	2	-	-	4
Art. insem. physiopathology	4	3	-	4	-	-	11
Mammal pathology	-	-	-	-	1	-	1
Cellular genetics	-	1	-	-	-	-	1
Cell. genetics histopathology	1	1	-	2	-	-	4
Surgery	-	-	-	-	-	-	-
Radiobiology, isotopes	-	1	-	-	-	-	1
Biochemistry-pharmacology	-	1	-	1	-	-	2
Computerization	-	-	-	-	-	-	-
Toxicology	-	-	-	3	-	-	3
Histology	-	-	1	-	-	-	1
Physiology-endocrinology	-	-	-	-	-	-	-