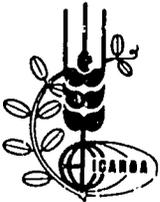


ICARDA

PREPARING FOR ITS SECOND DECADE



**INTERNATIONAL CENTER FOR AGRICULTURAL
RESEARCH IN THE DRY AREAS**

Box 5466, Aleppo, Syria.

For reasons of economy, this text is illustrated with black-and-white reproductions of the original color slides, inevitably - and regrettably - with some loss of quality.

To supplement the text, tables have been added at the end to provide a statement of expected year-end expenditures and to show how donors have supported ICARDA during 1987.

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ICARDA PREPARING FOR ITS SECOND DECADE

**A Presentation to the Consultative Group
on International Agricultural Research
October 26-30, 1987, Washington, D.C.**

by

*G. Jan Koopman
Acting Director General*

- 1 -

Mr. Chairman....

I stand before you today as the Acting Director General of a Center that is changing. To some degree, the changes come as the result of a combination of events that have happened all at about the same time; however, underlying the more obvious reasons for change is the fact that ICARDA has now been operating for ten years on its original mandate, and both the Trustees and staff are determined to make sure that our strategies and our programs are the best that we can devise to carry us into the next decade - and, indeed, into the next century.

One set of changes at the Center is the inevitable consequence of changes in its leadership. You know that our Director General for six years, Dr. Mohamed Nour, left us at the end of September. His style, his love for the Center and for the region, imprinted itself on everything we did. It was he who presided over the crucial years of the Center's development and who brought it to what it is today. A search committee will be making recommendations to the Trustees next month, and we sincerely hope that a new leader will be with us soon.

However, experience shows that a new Director General is not always immediately available and, in the meantime, we seek to maintain our momentum and to manage the affairs of the Center.

Dr. Nour was not the only senior person to leave us. For nine months we were without a DDG for Research. Fortunately, Dr. Aart van Schoonhoven joined us on the first of September, and he is already demonstrating his skills for shaping and focussing the scientific thrust of our program. In August we also lost Mr. Edward Sayegh, the Financial Controller who, in often difficult circumstances, had always managed to bring us to the end of the year with a little cushion that could be added to the reserves. His successor has not yet been found. In the last year, however, we have acquired a new Director of Administration, Mr. Samir

El-Fayoumi, who is seeking to streamline our administrative services, both to improve their effectiveness and to reduce their cost. A second set of changes is imposed by the move into our new permanent headquarters. Scattered as we were on several sites in Aleppo and at the farm, we have now all come together in new modern buildings that were designed specifically for efficient operations. The major moves took place in August, so we are still learning how to benefit from this magnificent endowment, but it has already done great things for our internal communication and interaction.

The engine that is now driving the process of change is our effort to develop a long-term strategic plan. This would be happening in any case, but we are quickening the pace in order to benefit from the input that we expect to receive when we undergo our second External Program and Management Reviews. These are scheduled for Spring 1988, so time is short. But both the Trustees and staff are anxious to seize this opportunity to develop a plan that will guide our program in the future. It will not be ready in all its details before the External Program Review, but we want to define the broad lines and be ready to elaborate these during the EPK process.

With all these changes underway, our eyes are focussed very much on the future. I assure you, there is no complacency in ICARDA, no attempt to use our past achievements as grounds for claiming resources in the future. But this audience today represents the organizations that have generously funded ICARDA over the past ten years, and I believe it is right also to look back and to give you a few illustrations of what has been accomplished.

As you all know, ICARDA has been entrusted with global responsibilities for three commodities: barley, faba bean and lentil. We have not lost sight of the global mandate, but we have always given first priority to the region of West Asia and North Africa - a region stretching from Morocco in the west to Pakistan in the

east, and from Turkey in the north to Ethiopia in the south. Here, there are 350 million people, most of whom live under harsh environmental conditions, and it is largely our work for this region of which I wish to speak today.

It would be easy to be pessimistic about the prospects for food security in West Asia and North Africa. These are lands ① that have been tilled and grazed since man first began to domesticate animals and to plough the soil. Much of the area available has become exhausted in the process - as shown by the thin crop in the slide ② and, where there is slope ③, there is often little or no soil. On the drier margins, the process of desertification continues today, and may even be faster than it ever was. The creeping sand dune in the slide ④ is a special case, but the problem manifests itself at the margin of cultivated land in many different ways.

Some respite has been achieved through the introduction of irrigation ⑤, particularly along major rivers, such as the Nile and the Euphrates. But, as dams are built and irrigation is developed in the headwaters, river flows diminish in the downstream reaches. Many more wells have also been constructed and, unfortunately, as a result, groundwater tables are falling almost everywhere. Moreover, salinity is a growing concern in many of the irrigated areas. These are indications that development of full-scale irrigated agriculture is reaching its limits in most parts of the Region and that substantial increases in production and employment will need to come from improved rainfed farming and range management.

Deficits in food and feed production are consistent problems. Countries use scarce foreign-exchange resources to import wheat - and barley imports are growing from year to year ⑥.



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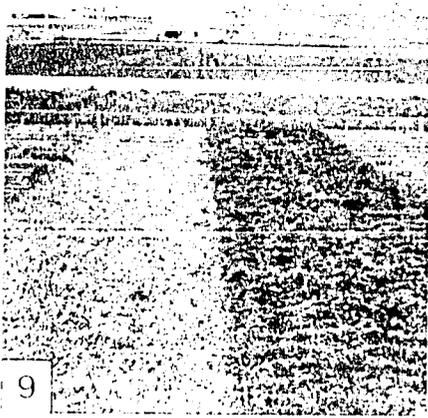


Demographic pressures aggravate the problems. Population growth rates remain very high in many of the countries of the region **7** and, although we have seen significant rural-urban migration, this has not halted the increasing pressure of people on the land. It could be said that there are vast areas that should not be ploughed but, without the meagre crops that can still be produced, how could the people living there feed themselves and their children?

ICARDA seeks to develop the varieties and agricultural technologies that will enhance production and improve living standards **8**, while - at same time - doing what we can to halt the process of land degradation. That is the challenge.

It would be very satisfying if we could bring high-yielding varieties developed elsewhere, adapt them for local use, and make them available for dissemination. Unfortunately varieties that yield well under favourable conditions, often do not yield well when subjected to the stresses of the local environment - here **9** we see an Australian medic killed by frost, while an indigenous species survives. And, in our region, climate imposes hazards that may be extreme and are always unpredictable.

Summers are hot and devoid of rain. The growing season is the winter and early spring. Rain can come at any time in this



growing season, but then, so can drought and cold – a few days of good growing weather, and then perhaps fifteen nights of frost. The slide 10 shows how cold can kill an otherwise healthy crop of faba bean. Later in the spring, the onset of hot weather and the depletion of soil moisture put an abrupt end to the growing season.



Cereals

Our cereal breeders have needed to develop an appropriate strategy to increase and stabilize barley and wheat production under these environmental conditions 11. As said before they



soon found that cultivars selected under favourable conditions often fail under stress conditions. Now we look for desirable traits in both cultivated and wild species when growing under stress. We make our crosses to combine the desirable traits **12**, and again we multiply and select under the very same conditions for which the new lines are intended. Every year now sees the adoption and release of new varieties by one or more of the national authorities in the region (Sham 4, **13** is a breadwheat). Barleys, and also durum wheats and bread wheats, developed in cooperation with CIMMYT, are tested by national programs and are gradually taking over in the region, yielding much more than local cultivars in good years, but also maintaining productivity in bad years **14**.





Some of the countries of the region, notably Cyprus, Turkey and Tunisia **15**, now have sophisticated programs of their own for cereal improvement. We are happy with their success; we will continue to meet their requests for germplasm and we will cooperate with their research on special problems; but we are re-directing much of our effort to those countries that still need our direct support for their breeding programs.

Food Legumes

Faba bean **16** is an important component of the staple diet both in our region and in China (the poor man's meat), but it is one that has been given very little attention in other research programs. Because it out-crosses readily, breeding is difficult, and pure commercial varieties are unknown in the region. Faba bean has the potential of giving very high yields, but it tends to be very susceptible to the onslaughts of diseases **17** and pests.





In addition, cultivars that are highly successful in one district may be totally unable to adapt to another.

Now, at last, we are beginning to see fruits for all our labor with faba bean, and Iran recently released the first variety from germplasm supplied by ICARDA through the international testing network.

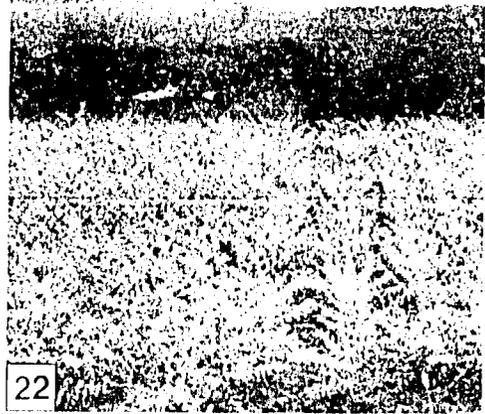
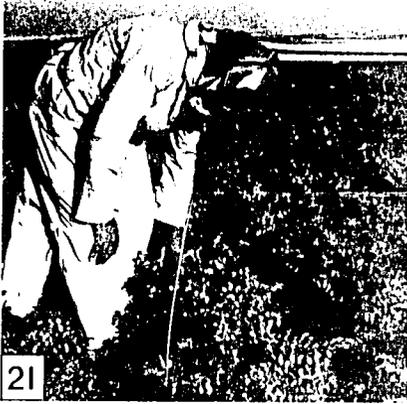
With the development of autofertile lines, desirable characteristics, once incorporated, can be retained in subsequent generations. Plants with a determinate growth habit **18** terminate with flowers and, by limiting their vegetative production, put more energy into the development of pods and seeds. Plants with independent vascular supply to the different flowers **19** are able to set more pods and are far less likely to shed them before maturity.

Meanwhile, in the Nile Valley project, which is one of ICARDA's major cooperative projects, Egyptian, Sudanese and Ethiopian scientists have secured the cooperation of farmers **20** and, together, they have demonstrated substantial increases in faba bean production, partly because of the selection of cultivars, but especially by improving agronomic practices and by controlling the parasitic weed, Orobanche.



The Nile Valley Project for faba bean improvement is a fairly unique model of cooperation in which about 100 senior scientists from the three countries participate. The program has a single ICARDA Director of Operations in Cairo coordinating scientific, financial and material support. The Project is in its 9th year of operation, and planning and negotiations for a 5-year extension have been largely completed.



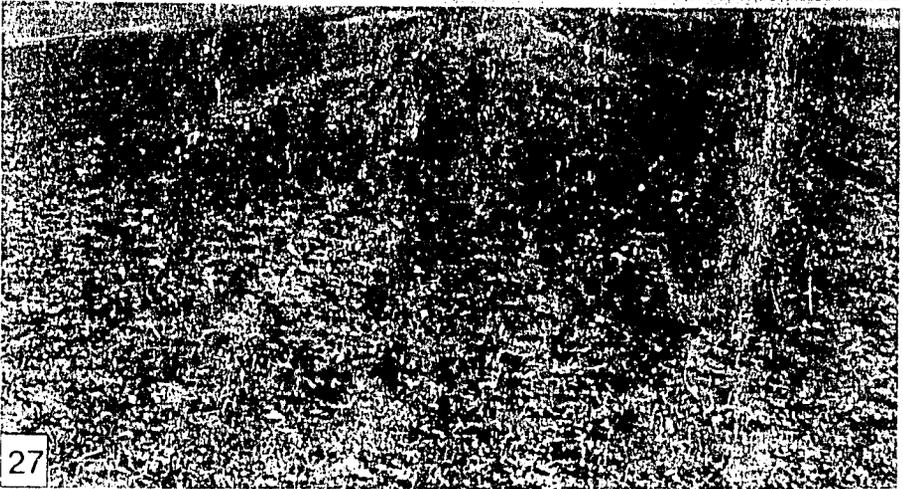


In some areas, chickpea production **21** has been doubled by planting in December rather than in March. Winter sown chickpea **22** benefits from all the moisture available in the early months and escapes the heat stress later in the year. Winter-sowing became possible only after ICARDA, in cooperation with ICRISAT, had developed cultivars resistant to *Ascochyta* blight **23** which, otherwise, has a disastrous effect on chickpea in the wetter months. Varieties developed for winter-sowing have been formally released in Cyprus, Iraq, Syria, Tunisia and Turkey, and the practice is spreading rapidly.

Lentil is a crop that is eminently suited to the cropping systems of the moderately dry and colder parts of the region. Unfortunately, the area sown to lentil has been diminishing in many of the countries around the Mediterranean, and this is largely because of the high labor costs in hand-harvesting **24**. ICARDA has now developed varieties that stand tall, are less likely to lodge, and hence are more suitable for mechanical harvesting. This work, together with the engineering of suitable harvesters, has been demonstrated with several national programs. The double knife cutter bar **25** is only one of the machines developed. A more sophisticated prototype is a machine that imitates harvesting by hand-pulling, thus conserving a larger

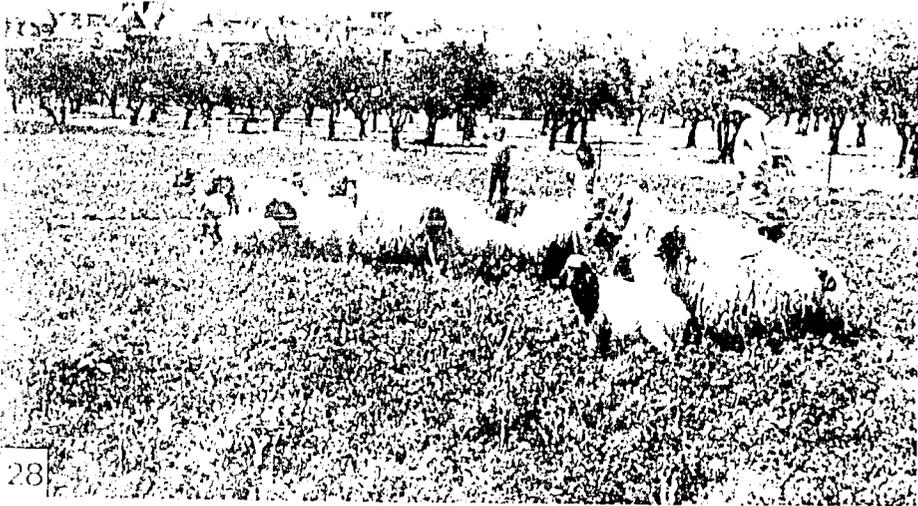


share of the very valuable lentil straw. The improved varieties have already been released in Ethiopia, Syria, Tunisia and Turkey and, with the development of mechanical harvesters, may lay the foundation for a recovery in lentil production.



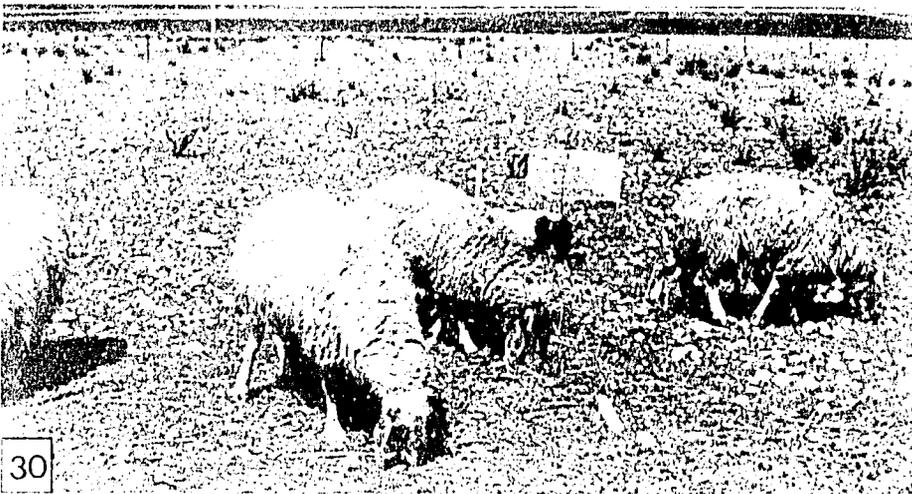
Pasture, Forage and Livestock

Our combined program on pastures, forage and livestock was established only after the first External Program Review in 1983, but it has clearly demonstrated the potential for a great increase in the number of sheep that can be carried on the farms of the region (26). Barley, both grain and straw, is the key source of fodder, and farmers have traditionally followed a barley/fallow rotation (27). The fallow helps to restore soil fertility but, of course, it means that 50% of the land is out of



production in any one year. With population pressure increasing, many farmers now use fertilizer and grow barley every year on the same land. However, yields are steadily declining and, as such monocropping is dangerous for the future, we are happy to report that there are alternatives that are economically attractive.

We believe that the ley-farming system that is widely used in Australia is also adaptable to those areas of the ICARDA region that receive more than 250 mm of rain, although our experience has been where there is more than 300 mm. By sowing self-generating annual legumes, ICARDA has shown that farmers can keep bigger flocks on their land and that, after a year dedicated to pasture **28**, the wheat yield is at least as good as it was after fallow. This is partly due to nitrogen that is fixed by the Rhizobium associated with the leguminous pasture. Similarly for somewhat drier areas, research on farmer's fields has shown that common vetch and chickling, sown as forage crops **29**, are economic alternatives to fallow in a rotation with barley. For still drier areas, we are beginning to look at the possibilities for perennial forage shrubs and small trees. And



we have also demonstrated that the grazing on marginal lands **30** can be enhanced with the application of phosphate: the economic return to the farmers more than compensates for the cost of this fertilizer. In our work, marginal lands are by definition "non-arable". They are used as a source of animal feed and as such in need of protection against erosion and desertification.

Our efforts to produce more feed for sheep also include studies of the quality of cereal straw, and we seek to improve its digestibility by genetic manipulation.



Farm Resource Management

Last year our Farming Systems program was restructured and re-named as the Farm Resource Management Program. It has clearly demonstrated that many of the soils of the region are deficient in both phosphate and nitrogen and that, even in quite dry areas, farmers can increase their profits by applying these fertilizers on barley crops **31**. The benefit of phosphate is two-fold **32**: by promoting root and canopy development, it improves the water use efficiency; and, by advancing maturity, phosphate helps the crop to escape the heat and drought that comes later in the season. The Syrian government in a major change of policy is now making agricultural credit available for the purchase of fertilizer in dry areas, and many of the farmers who were involved in our research are now buying phosphate and nitrogen on their own account. We look forward to a remarkable increase in barley production as a result. Conservative estimates indicate that, if this practice spreads, and 50% of the farmers start using fertilizer, Syria's production of barley gram could increase by 20%, or 200 000 tonnes coming mainly from presently

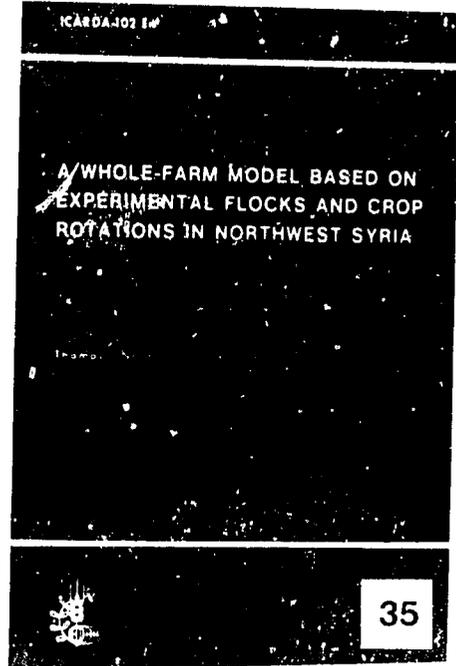


low productive areas. From the point of view of farmer's income, the increase in straw production would be equally important. Ten countries have now joined ICARDA in a network project, where the research is centred on the calibration of soil tests, with the objective to improve the efficiency of fertilizer use.

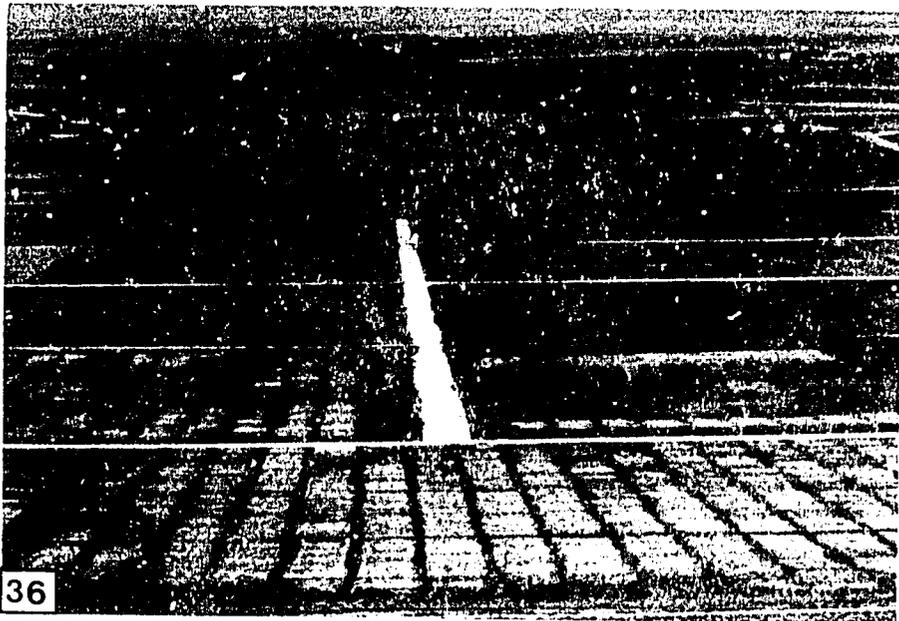
Calculations at IFPRI have forecast an exponential increase in demand for barley as animal feed **33**, so this development comes at a most auspicious time. Indeed, more and more, we see sheep **34** as the key component of both existing and future farming systems. Not only because of the surging demand for animal

products in an increasingly urbanized society, but also because the value that animals add to crop production provides the best hope for raising the income of poor farm families.

The development of whole-farm computer models **35** is making it easier for all components of the ICARDA program to assess the economic potential of new varieties, improved technologies, and alternative cropping sequences, and to understand the complex interrelationships between crops and animals.



In general, during its first five years, ICARDA sought to improve genetic material and to develop more productive technologies at its main research site near Aleppo, in Northern Syria **36**. During its second five years, now completed, it expanded





its work through on farm research and cooperative programs with all the countries in the region that have a major agricultural sector. The slide 37 shows the Goubellat area of Tunisia, the site of one of our cooperative projects. The work is carried out in a tripartite agreement with INRAT, the Institut National de la Recherche Agronomique de Tunisie - as the leading partner - and INAT, the agricultural university. For the future, we also look beyond the region and we stand ready to share the results of our research with other countries where comparable agro-ecological conditions exist: in China, South Asia, Southern and Eastern Africa and the Andean Region.



A special area of interest, long neglected, is the high-elevation plateaux where a combination of stress factors poses a challenge to crop, range and animal improvement. The slide **38** is from Pakistan and shows an example of most appropriate technology. ICARDA's involvement in Pakistan is an institution building and research-implementation effort at the new Arid Zone Research Institute (AZRI) in Quetta on the Baluchistan highlands, an institute of the Pakistan Agricultural Research Council (PARC). ICARDA scientists are working side by side with the Institute's staff and providing research leadership during its crucial formative years.

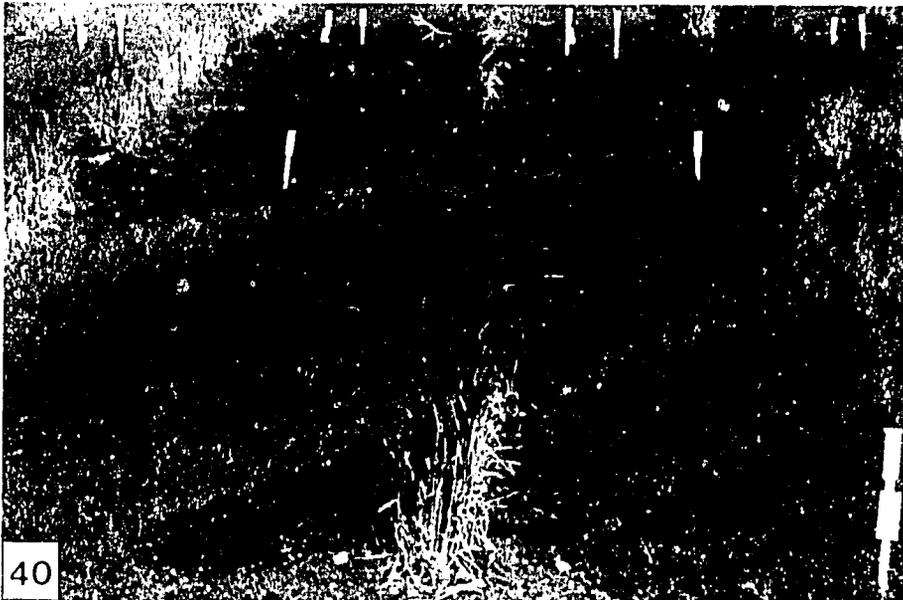
The Nile Valley Project, AZRI and Goubellat (Tunisia) are but three examples of ICARDA's cooperative work carried out in 15 countries in the region.

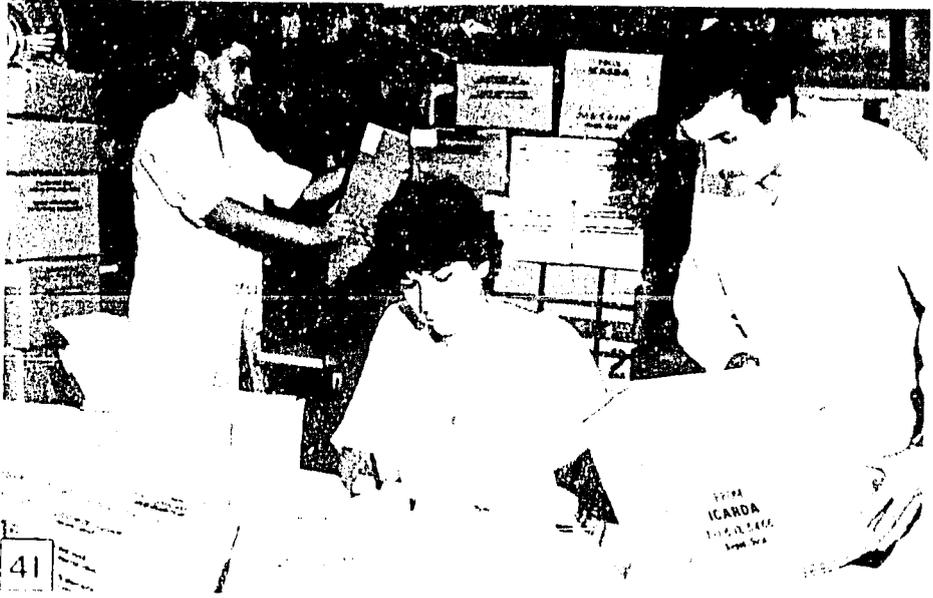
Genetic Resources

This program now has more than 70 000 accessions in its genebank **39**. In cooperation with national organizations, it has collected cultivars, landraces and wild species from many of the countries in the region. This, too, is an urgent task because, as modern agriculture pushes into more marginal areas, there is great danger that some habitats will be destroyed along with the



species and varieties that can only be found there. This is especially true for West Asia, which is the region of origin of many of the most important cultivated crops. In this area, the landraces and wild species have been subjected to severe environmental stress throughout history. They carry the genes that provide tolerance or resistance to a wide range of biotic and abiotic stresses. If these genes are to be incorporated in im-

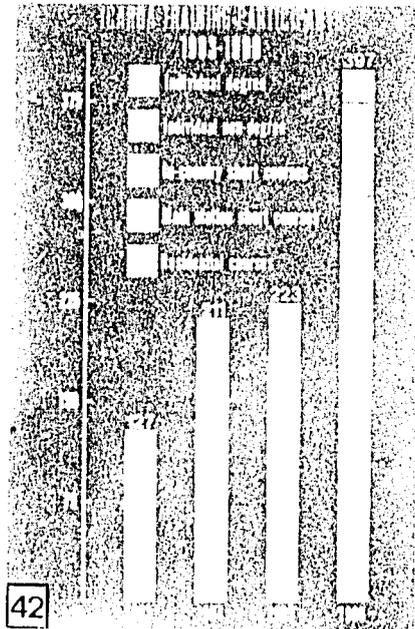


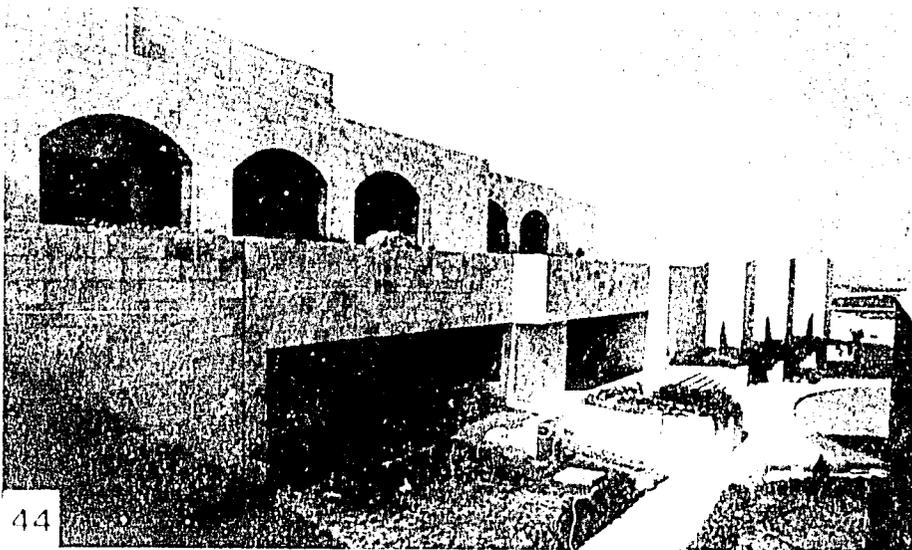


proved cultivars, we must systematically explore the landraces and wild species **40**, collect, preserve, and utilize them. We cooperate with national organizations, not only in collecting, but also in filling gaps in their own collections **41**.

Training

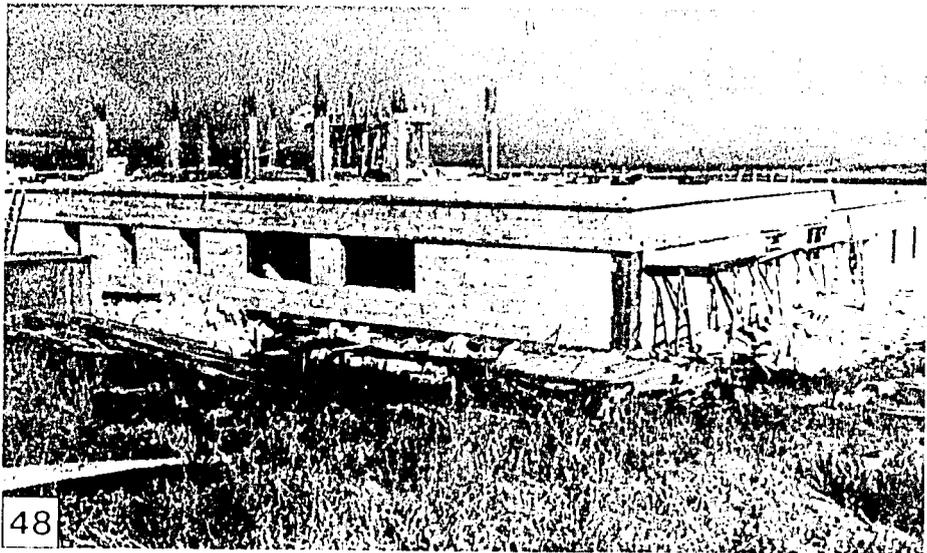
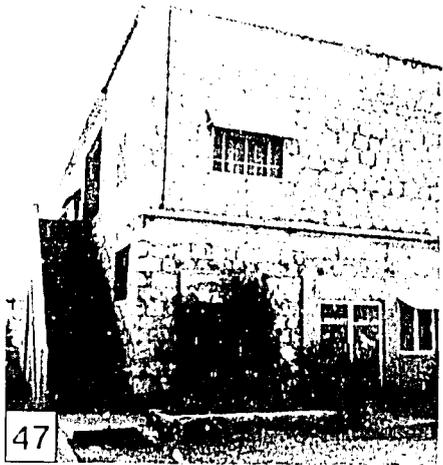
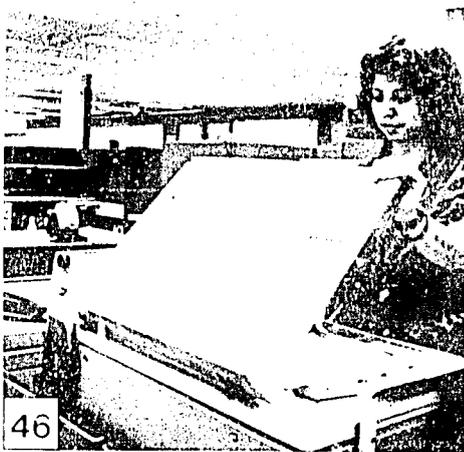
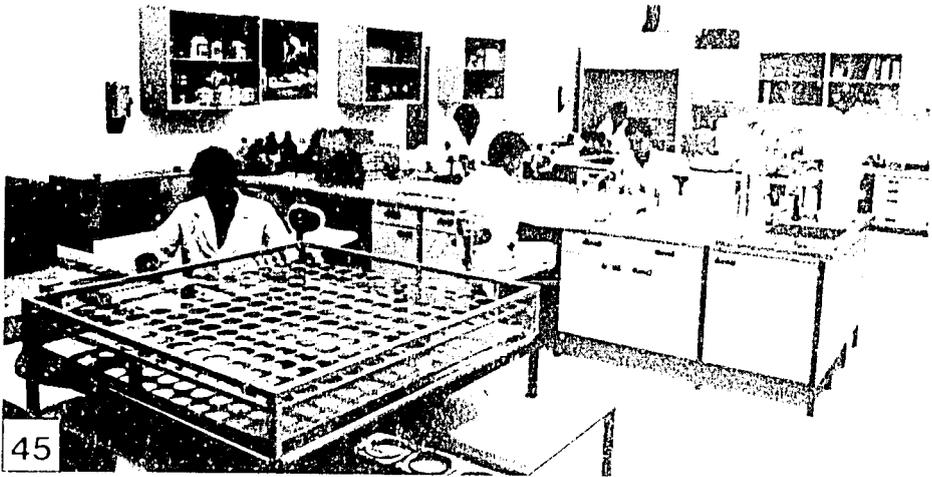
Training is, of course, a most important part of our activities. The slide **42** shows how the number of trainees has jumped from year to year. We have signed agreements with many of the principal universities in the region, and we cooperate with them, especially in providing research facilities for the thesis work of their graduate students.





ICARDA's New Buildings

And now I show you a few slides of our new buildings **43**, **44**, **45**, **46** ... and one of our old buildings **47** (downstairs was the library, upstairs the training centre!). The building program is largely accomplished, but not quite yet. Here **48** is the Genetic Resources building that is well on its way. Later, we shall need to construct facilities for the accommodation of trainees and for the on-site housing of a few key personnel.



Many of you have been to ICARDA. I wish more of you would come. I know that, in Western media, our region is presented as one in constant conflict. But I assure you that we feel almost nothing of that as we go about our work. Our staff travel to all the countries and, wherever they go, they find agricultural scientists eager for cooperation and eager to get on with the job of securing food production and improving the life of the rural poor. For its part, our principal host country, Syria, grants free access for all scientists seeking to visit ICARDA, regardless of any political differences that may exist with their countries of origin.

And now again to the future! We have already made a number of promises to ourselves, and we believe that these will be welcomed by our donors:

- 1) In designing our future strategy, we will not be prisoners of our present organizational structure.
- 2) We are listening to our colleagues in the national research programs of the region, and we will try to match our priorities to their most important needs.
- 3) We will not be seduced by any a priori concepts about the type of research we should conduct. ICARDA has had a 'midstream' program. Whether we send particular boats "upstream" or 'downstream' will depend on the results of our analysis of needs. In fact, most of our upstream work is now carried out through collaborative projects with a wide range of advanced institutions in North America, Europe and Japan, but we are developing staff resources and facilities at ICARDA to become partners of equal merit and to assist in building bridges between institutions in developing and developed countries.
- 4) We will focus. Perhaps ICARDA's program has stretched itself a little too much during the initial years, both

in geographic terms and in subjects for research. We believe we might achieve more by concentrating our forces where they can be most effective.

- 5) We must assume that the countries of the region will become increasingly more conscious of the need to protect the environment and to conserve soil, water and natural vegetation. Thus, we must not be dogmatic about our present "mandate", and we must be ready to look at other commodities or farming systems that offer the promise of providing a decent living to farm families - especially those that are living in areas where soil tillage may be restricted by present or future legislation.
- 6) We recognize that it is climate and soils that dictate what farming systems can be employed in any one area, and that we must imbue all our work with a systems perspective. Hence our research on particular commodities will be focussed on the roles that those commodities will play within particular systems.
- 7) While research will remain central to our mission, we shall continue and reinforce our efforts to support national development through training and improved access to information.

We have little time before we meet those who will come to review our program and management. An intense activity is underway to prepare for their arrival. Let me conclude by reading to you the present draft of the Mission Statement that we will be presenting to them:

"Through research, training and dissemination of information, and in collaboration with other relevant centers and institutions, ICARDA will assist national agricultural research programs (NARS) to improve and stabilize basic food crop and livestock production and to sustain increased productivity of rainfed farming systems in the different agro-ecological zones,

primarily those of the countries of West Asia and North Africa".

These are the principles that are currently guiding our work and we trust that they will also be valid in the future.

Table 1. Estimates of ICARDA expenditures for 1987 (thousand USD).

Research	
Farm Resource Management	2100
Cereals	2362
Food Legumes	2350
Forage and Livestock	1800
Research Support	
Genetic Resources	700
Farm Operations	2000
Computer	500
Training	700
Information	1050
Cooperation with National Programs	600
Trustees and Administration	2700
General Operations	2500
Capital	600
	<hr/>
	19962

Table 2. Projected sources of funds for ICARDA's core programs and capital requirements for 1987 (thousand USD).

Arab Fund	355*	Italy	1296*
Australia	246	Netherlands	554
Austria	175	Norway	433
Canada	783	OPEC	115*
China	30	Spain	155
Denmark	244	Sweden	541
Ford Foundation	210	UNDP ²	320*
France	262*	United Kingdom	910
Germany (BRD)	2179*	USAID ³	4820
IBRD (World Bank)	4800	Earned Income	1200
IDRC ¹	334		<hr/>
			19962

* Part or all of these amounts were provided for specified activities (restricted core)

¹ International Development Research Centre, Canada

² United Nations Development Programme

³ United States Agency for International Development

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