

Major Achievements During the first year of Phase II, 2000 – 2001

Summary Report

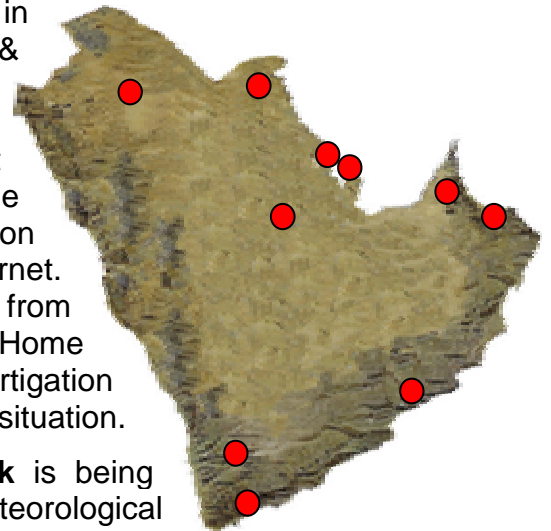
Research Activities

The APRP Home page was developed and published on the Internet WWW.ICARDA.CGIAR.ORG as part of the ICARDA Web Site. This useful medium maximizes collaboration among researchers, scientists, and extension staff in the AP countries and facilitates the exchange of knowledge, information, and expertise, both regionally and internationally.



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- The **Information Technology Systems for Agriculture and Natural Resources Development in the Arabian Peninsula (ITAP)** was developed in collaboration with CLAES and CLAC in Egypt. An initial version of the Irrigation & fertigation system for protected agriculture crops has been completed. Work is continuing on development the expert systems and their integration with the weather information network. The information will be accessed through the Internet. Researchers, extension staff and growers from the AP countries can access the APRP Home Page to tailor the irrigation and fertigation programs for their specific crop production situation.
- An **automated weather station network** is being established to provide near real time meteorological information for use in irrigation scheduling and

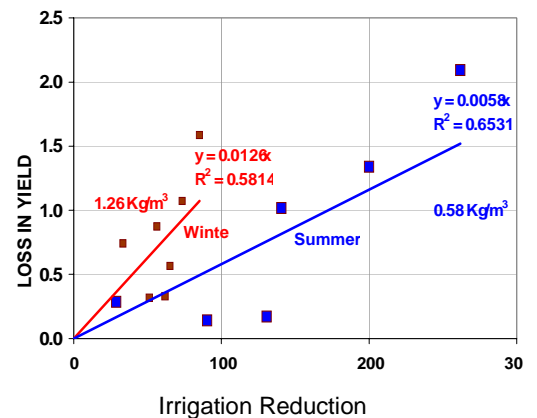


management. The network will initially consist of 10 stations linked by telephone to a central computer that will download the data daily, process it so that it is easy to use for the end users, and make it available through an internet site. Near-real-time irrigation scheduling is an example of how such a system can be used. Some 10 fully automated weather stations were purchased for the AP countries.

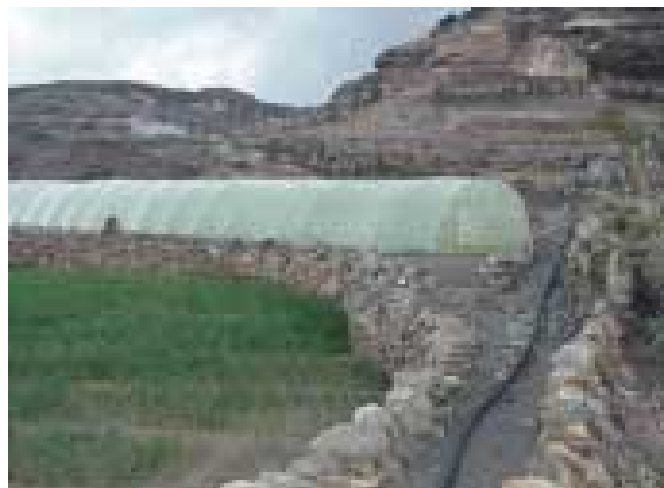
- The development of the **Expert System for Crop Protection** (cucumber) has been developed. The initial version is completed and under test by different experts from the region. The proven version will be available under the APRP Home Page for researchers, extension staff and growers to use and evaluate.
- Preliminary information is now available on the response of two of the priority **indigenous species** to reduced irrigation. Information such as this is necessary to develop computer models that can compare water use under different production scenarios.



Data from a winter and a summer cut of *Cenchrus Ciliaris*, showing the reduction in yield that resulted from a reduction in irrigation. An irrigation reduction of 10mm is equivalent to 100m³ of water per hectare



- With **priority species identified**, a necessary step is to obtain large quantities of seeds from these species and lay the grounds for mechanized seed multiplication. In the period February-April 2001, bulk seed samples of *Cenchrus ciliaris*, *Coelachyrum piercei* and *Lasiurus scindicus* were collected from a natural reserve in the United Arab Emirates. The material has provided an opportunity to test seed scarification and cleaning equipment.
- **Seed multiplication** was started in both United Arab Emirates and Sultanate of Oman. In UAE, two locations, each of 5 hectares, were laid out in two Research Stations for seed multiplication of the indigenous forage species. The three grasses are



already established in both research stations and seeds are being collected. Enough seeds are now available to plant up to 100 hectares.

- Terrace farming in Yemen has always been associated with rainfall and water harvesting from the watersheds surrounding the terraces. ICARDA, through APRP, has started an R&D project in Yemen to **introduce cultivation of cash crops in greenhouses in the mountain terraces**. The main objectives of this project are to: (a) create additional income for farmers through the cultivation of cash crops at those times of year when the terraces are not producing field crops. (b) Introduce new techniques of cultivation and irrigation for the rational use of resources, (c) Intensify the use of terrace lands through the cultivation of cash crops in winter, (d) Raise the economic returns from farming the terraces, leading to better management and maintenance of these terraces, and (e) Create additional jobs for the rural population, thereby encouraging farmers to settle in rural areas and reduce the pressure on urban centers.
- The **Integrated Production and Protection Management (IPPM)** Program is being further developed and implemented by growers in the different AP countries. The extensive use of chemicals to control diseases and pests in greenhouses results in complex problems of resistance build-up, and health and environmental hazards. Crop protection can be achieved by using control measures other than relying mainly on pesticides, thereby reducing the use of hazardous chemicals. These control measures are part of an Integrated Production and Protection Management program (IPPM). IPPM was implemented in all the Arabian Peninsula (AP) Countries by both research stations and private growers.
- **Soilless growing technique** was introduced in Oman and UAE using simple growing channels constructed with locally available materials, for the production of tomato, cucumber, pepper, and lettuce crops. The economics of this technique was compared with conventional soil-based growing techniques.
- **Solar Solarization** techniques were developed and simplified for growers, and a technical booklet has been published. The techniques have been implemented in research stations and private farms with excellent results without any hazardous chemicals being used.
- Research continues with the **new greenhouse design** that was developed and constructed in Bahrain. This oval shaped structure provides extra crop protection and the ability to inject additional CO₂ economically. It also provides an improved cooling system and a facility to recover fresh water from the enclosed area.

