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TUNISIA

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Importance of the agricultural sector

The agricultural sector, in Tunisia, constitutes an integral part of the overall economy. In spite of the significant development of the other sectors agriculture continues to play a key role in the national economy. Its share in the national GDP was about 14% during the decade 1987-1996. The agri-food sector constituted around 10.4% of the total exports; in 1998 its contribution was around 640.3 millions Tunisian Dinars (9.8% of the total exports). In addition agriculture provides a major source of livelihood for the rural and the agricultural populations which represent around 24% of the total population. In recent years Tunisian agriculture has witnessed a vigorous expansion and now contributes to up to 60% self-sufficiency in basic food (cereals meat and dairy products) with a surplus of exportable fruits and vegetables which alleviates the deficit in the agricultural balance.

Policy statement

The government has long been aware that if Tunisia wants to cope with the needs of a fast growing population (10 millions in 2001) with higher standards, at the same time, meeting the challenges of the newly emerging global economy, agricultural policy has to be reformulated to meet new world orientations such as open market policies, environmental protection and sustainability. In order to achieve these objectives, efforts have been made to promote research, training, and extension so as to provide the farmers with suitable packages of modern technology. Beside this, the government has

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taken legislative, logistical and fiscal measures to encourage investments, productivity, privatisation of the agricultural lands and liberalization of the economy. Development strategies have been set to improve productivity and competitiveness in quality and price of strategic commodities such as cereals, olive oil, citrus, dates and vegetables.

Fruit tree sector: production, trade flows and germplasm

The fruit sector in Tunisia is a highly interdependent network of producers, suppliers, processors, nursery growers, wholesalers and retailers. A wide range of fruit trees are grown in Tunisia, these are grown to some extent in every geographical area of the country. The total area under cultivation is estimated to 2 million ha with olive trees, date palm, grapevine, citrus and stone fruits being the major crops. Income originating from fruit production was estimated to 319.8 millions Tunisian Dinars during the decade 1987-1996 with an average production of 610,000 metric tons. Currently fresh fruit production is estimated to 750,000 tons with the largest proportion being consumed locally, the surplus is being exported which contributes significantly to the reduction of the agricultural trade balance deficit. Fresh fruit constitutes about 66% of the agricultural exports. In spite of the significant expansion of the fruit industry in recent years, this sector is still facing several technical, structural and institutional constraints and because of these limitations the fruit productivity in Tunisia, as in many other similar countries, does not unfortunately compare favourably to the developed world countries.

Olive. Olive tree is one of the most widely grown fruit tree in Tunisia, it plays a major social, economical and cultural role. Olive trees are grown primarily for processing and to a lesser extent as table olive in all parts of the country where environmental conditions are quite suitable. Olive trees cover an estimated area of 1.600 million ha out of which 20,000 are irrigated Although Tunisia has a very rich and diverse olive trees patrimony

the most widely grown olive oil varieties are Chemlali and Cbetoui, whereas the main table variety is Meski. The main constraints facing the olive industry include low productivity (10-30 kg/tree depending on the region), aging of trees (more than 25% of the total number is over 70 years), low quality of nursery materials, poor genetic performance and inadequate mechanization..

Citrus.Citrus trees are mainly grown in the North-eastern part of Tunisia in the Cap Bon peninsula, where the environmental conditions are quite suitable. Citrus trees are grown on an estimated area of 14,000 ha with 4 million trees. The average annual production during the 1994- 1998 period is estimated to 210,000 tons out of which 22,000 tons are exported to European countries with France being the main destination. In 1998 the income from citrus export is around 9.5 millions Dinars. The main citrus varieties are Maltaise, Clementine, Sweet orange Mandarin, lime, W. navel and Valencia late with Maltaise occupying the first position (46.9%).The main constraints confronting the citrus industry include, low productivity (around 19 tons/ha), aging of trees, traditional cultural practices and post harvest techniques.

Grape. Grape is grown for processing and as fresh fruit mainly in the northern and north-eastern (Cap Bon) parts of Tunisia. It covers around 25,000 ha out of which 14,500 are for processing purposes. Table grape and wine production are estimated to 57,000 and 47,000 tons respectively.

Stone fruits: Almond, apricot, peach and plum are the main stone fruits in Tunisia. Almonds are grown mainly in the central and northern parts of the country in an area of approximately 320,000 ha with around 20 million trees. The almond production is estimated to 50,000 tons out of which 300 tons are exported. Apricots are grown mainly in the central part of Tunisia, in recent years cultivated areas and production have increased significantly, cultivated area passed from 11,500 to 16,400 ha from 1986 to date and production from 19,000 tons during the 1989-1993 to 24,850 at present time. Current apricot export is estimated to 238 tons. Peaches

and plums are grown in an area of about 42,500 and 10,600 ha respectively with a production estimated to 65,000 tons for peaches and 11,500 for plums.

Pome fruits: Apple , pears and quince are the most common pome fruits in Tunisia. They are mainly grown in the northern and western parts of the country. Cultivated area is estimated to 48,000 ha and production to 96,000 tons.

Nursery sector

To meet the need of a fast expanding fruit trees industry nursery activities have increased significantly in recent years. Currently there are about 130 registered nurseries in Tunisia. The 1998 production is estimated to 6,157,600 nursery plants. To upgrade the domestically produced nursery fruit tree materials an ambitious multidimensional program has been setup by the government. The program is intended to select and preserve basic healthy true-to-type fruit tree materials that will serve for the production of certified nursery plants.

Sanitary status of fruit trees with emphasis on virus and virus-like agents

Fruit tree cultivation in Tunisia is being subjected to many pests and diseases. Viruses , nematodes , bacteria and fungi are imposing significant constraints on the productivity and life span of orchards. Unfortunately for many of these diseases particularly those caused by plant viruses information on their incidence and ecology is still limited. Efforts are recently made for the production and distribution of healthy propagating fruit tree materials, to achieve these objectives disease surveys were initiated to identify the main virus and virus-like problems associated with fruit trees and in particular citrus, grape and stone fruits. The following is a brief summary of the current status of diseases of fruit trees :

Citrus: Several viral and virus-like diseases of citrus including psorosis, blind pocket stubborn, exocortis have been described by Jammoussi in the

sixties (9) studies were based essentially on disease symptoms. It is only recently (1993) with the initiation of the national program on citrus sanitation when indexing programs based on biological, serological and molecular techniques were started with the assistance of PNUDIFAO Project RAB/88/025. Surveys undertaken in the main citrus production areas indicated the presence of the following viruses and virus-like agents (3,11): psorosis complex, cachexia xyloporosis, exocortis, Infexious variegation and leaf rugose. Other common diseases observed on citrus include: nematodes gummosis and mal secco on lemon

Grape: The wide occurrence of viral diseases on grape in Tunisia has been recognized since in the mid eighties (10). Investigations carried during the nineties within the framework of the Mediterranean Research network for the study of epidemiology of grapevine Clostereovirus and the PNUDIF AOIRAB/88/025 Project revealed the presence of several important viral and virus like agents including GFLV, GLRaVl,Z and 3,GVA,GVB,TMV, PVX, ToBSV, GYS viroid (1,4,5,6). Other common diseases of grape are powdery and downy mildews, brown rot, Esca and Eutypa diseases and nematodes.

Stone fruits: Only limited studies have been realized with regard to stone fruit virus and virus-like diseases. The most extensive survey undertaken in the main growing areas was carried in the mid nineties in collaboration with IAM Bari (2,7,12,13). Results of the survey revealed the occurrence of several viruses including: PNRSV,PDV, ApMV, ACLSV. The plum pox virus (PPV) and members of the nepoviruses were not detected. The virus incidence ranged between 34 and 4.7%, with almond showing the highest rate of infection and apricot the least one. Other important diseases of stone fruits include , nematodes , crown gall, bacterial canker and several common fungal diseases.

Olive and pome fruits: Information concerning the phytosanitary status of olive and pome fruits with respect to virus and virus-like diseases are not available.

Conclusion

The following conclusions may be made from the analysis of the phytosanitary status of fruit trees in Tunisia:

1. Data concerning virus and virus-like diseases are still quite limited and most of the information is originating from few limited surveys carried out with the help of international institutions. Data on viral diseases affecting important crops such as olive and pome fruits are still lacking.

2. Available information indicates that the health status of fruit trees in Tunisia is far from being satisfactory. Many important virus and virus-like agents associated with citrus, grape and stone fruits are present in the country, however their incidence, epidemiology and ecology need further investigation.

3. Destructive virus and virus-like agents such as citrus tristeza virus (CTV), the greening of citrus and the plum pox virus (PPV) of stone fruits are not currently present in Tunisia.

Plant protection: service and institutions

The plant protection service, as a subdivision of the Directorate General of plant production, supervises all plant protection activities in the country including policy setting, surveillance and forecasting, quarantine, certification, and elaboration of pest management strategies. The plant protection service has central laboratories including entomology, plant pathology, vertebrate, locust, weed, pesticide, quarantine and the newly created fruit trees virus indexing and certification centre. In addition to the central laboratories there are three regional stations charged with coordinating plant protection activities at regional level.

Research activities dealing with protection of fruit trees are carried out in various research and

teaching institutions including Institute National de Recherche Agronomique de Tunisie (INRAT), Institut National Agronomique de Tunisie (INAT), Ecole Supérieure d'Horticulture et d'Elevage (ESHE), and Institut de l'olivier. Research activities on fruit tree viruses are being carried out mainly at INRAT in the virology laboratory by two young researchers working mainly on citrus and grape viruses. The virology lab at INRAT is capable of handling basic plant virus diagnostic work.

Certification

Efforts to produce good quality propagating material in Tunisia started in the seventies with the establishment of the national bud-wood production trees collection. Selection of candidate trees was done by INRAT. This has permitted to supply nurseries with true-to-type budwoods however, the health status of the material was not fully guaranteed.

The first national program for the production of healthy fruit trees propagating material was elaborated in 1993. Implementation of the program was done with the support of the PNUDIFAO RAB/88/025 project and the profession. The objectives of the program included sanitary selection of native varieties of citrus and grape, introducing exotic good-performing varieties, supplying true-to-type and virus-free material to nurseries. The program has led to the selection of several virus-tested local clones of citrus and grape.

Production and commercialisation of fruit trees in Tunisia are regulated by the general Law n° 76-133 of November 1976 relative to the organization, control, production and commercialisation of seeds and plants, modified by law N° 99-42 of 10 May 1999. Proposals specifying the production schemes and commercialisation of certified fruit trees material for various fruit species are being prepared, EPPO guidelines are being taken into consideration. Responsibility for the plant certification is assigned to the General-Directorate for Agricultural Production (DGP A) (Service de contrôle et de certification des semences et des plants).

Improvement of the certification program. With the future open market policy, trade and competitiveness of propagating materials and fruits will depend to a large extent on the productivity and the quality of the products. Hence, the need for establishing fruit trees certification programs to produce true-to-type and healthy good performing fruit trees became a necessity. Certification programs have been adopted by many countries throughout the world. In Tunisia such program is still at an early stage and efforts are now devoted to (1) set the appropriate programs for sanitary selection, (2) provide the needed facilities to produce and preserve obtained healthy plant material (3) set adequate legislation for a successful certification program. However, in spite of the achieved progress the certification program still requires many efforts before it can effectively function. The following aspects need to be strengthened.

- *Human resources:* Academic training of horticulturists to collect and characterize available genetic resources and plant pathologists to study diseases associated with fruit trees , their incidence and ecology and to monitor the health status of the certified material. Only a limited number of specialists is now available in Tunisia.

- *Training:* providing appropriate training for the scientific and technical personnel working within the certification program.

- *Facilities:* providing adequate infrastructure for the certification service to monitor the health status of propagating material during the different phases of the certification process including a virology lab capable of handling routine diagnostic work and controlled greenhouse facilities for biological indexing.

- *Legislation:* Setting the needed legislation relating to the certification schemes of important fruit species.

- *Funds:* Providing the needed funds to cover expenses of the certification program.

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