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Certification of stone fruit trees in Morocco

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Virus and virus-like diseases are known to affect tree vigour, production, and longevity. For example, Sharka (caused by plum pox virus) reduces fruit quantity and has killed several million trees in Eastern Europe. Apple chlorotic leaf spot virus (ACLSV) induces graft incompatibility in apricot (Marenaud, 1968; Duquesne *et al.*, 1976).

Pertaining to the two most widespread viruses in Morocco, namely Prunus necrotic ring spot virus (PNRSV) and prune dwarf virus (PDV), it should be noted that 80% of infected trees die. Harvest yields dropped from 37 to 99% (Topchiiska, 1982) and the fruits produced were of poor quality and unmarketable. It was shown that healthy trees can better exploit cultural treatments (notably fertilisers).

1. Plant Certification

The certification of stone fruit trees in Morocco was organised on the basis of the technical regulations concerning production, inspection, packaging, and certification of stone fruits in compliance with the DAHIR n° 1/69/169 of 10 Joumada I 1389 (25 July 1969) modified and completed by the DAHIR n° 1/76/472 of 5 Chaoul 1397 (19 September 1977), articles 1, 2 and 5.

According to this DAHIR, plants must be controlled and certified following the specifications of the technical regulation. Certified plants may be marketed only by the institutions authorised by the Ministry of Agriculture.

Responsibility for the plant certification was assigned to the Directorate of Plant Protection, Technical Inspections and Fraud Repression (Service du Contrôle des Semences et Plants B.P. 1308 RABAT).

Certification of plants was geared onto the control of their sanitary status and origin; certified plants shall be derived from a mother block (and seed block for grafted plants) whose trueness-to-type and sanitary status were strictly controlled in compliance with the technical regulation.

2. Essentials for the Production of Certified Plants

According to the above-mentioned technical regulation, the following conditions must to be fulfilled for the production of certified plants:

- ❑ the plot must belong to one owner, fulfil the conditions of the technical regulation, be fit for plant production, and easily accessible with a minimum production capacity of 50,000 plants;
- ❑ people must be technically qualified for the implementation of production operations under good conditions;
- ❑ equipment and material for the production, protection, and packaging of plants must be available; and
- ❑ soils or media must be free from diseases and pests harmful to the production of stone fruit trees.

Once these conditions were fulfilled, the nurseryman must submit a production declaration to the Service du Contrôle des Semences et Plants B.P. 1308 Rabat before the initiation of the programme. This declaration specifies the origin, the plant category, the variety or clone, and the number of plants to be produced.

The declaration must contain:

- ❑ a detailed map of the nursery, with references to ease of inspection and recognition of lots in the shortest lapse of time without risk of confusion;
- ❑ the amount of the control tax.

The nurseryman must fulfil the conditions specified in the technical regulation concerning isolation and rotation.

3. Plant Categories

The technical regulation specifies the following categories of certified plant material:

3.1. Primary source

It is made up of plant materials obtained directly from specialised institutions after registration in the official catalogue of species and varieties grown in Morocco, or in the list

of varieties to be certified. It includes two plants per variety, true-to-type, and free of known infectious diseases. It is grown in a screenhouse.

3.2. Pre-basic material

It is composed of trueness-to-type and healthy plant material descending from the primary source by vegetative propagation including grafting onto a healthy rootstock. At least five plants per variety must be propagated. These are grown in a screenhouse or in the open field and removal of flowers mandatory.

3.3. Basic material

This results from vegetative propagation of the primary source or prebasic material and represents for woody species the mother block (trees for scions or cuttings) and the seed block (trees for the production of seeds). It encompasses at least ten trueness-to-type and healthy plants per variety, and removal of flowers mandatory.

3.4. Certified material

Includes cuttings, scions, seeds, and rooted plants or grafted plants directly from basic, pre-basic material, or primary sources.

4. Inspections

The Service du Contrôle des Semences et Plants is responsible for varietal and sanitary controls in all the steps of stone fruit production. The categories of the plant material must be checked in the field and in the laboratory.

4.1. Field inspection

The field inspection in view of certification must be carried out in several steps:

Control of pre-basic and basic materials

It controls:

- trueness-to-type;
- sanitary status.

The various categories of plant material shall be true to the variety declared and free from diseases and pests listed in the technical regulation.

- isolation as laid in the technical regulation;
- estimation of the number of cuttings, scions or seeds.

Control in the nursery

This inspection assures:

- ❑ the origin of the plant materials;
- ❑ the aspects of isolation and rotation;
- ❑ trueness-to-type;
- ❑ sanitary status;
- ❑ plant maintenance;
- ❑ rate of graft take, germination rate of seeds.

Field control to be based on several inspections during the growing cycle of the species.

4.2. Laboratory control

a. Control of seed quality

The control of seed quality applies to species whose rootstocks were derived from seeds. Analysed seeds shall be produced by controlled and certified trees.

The control concerns:

- ❑ specific and varietal trueness-to-type;
- ❑ germination rate;
- ❑ free of insects.

b. Nematode control

Plots or media must be free of nematodes as specified in the technical regulation. Some samples must be taken from the plots and analysed in the laboratory.

c. Sanitary control

It concerns virus and virus-like diseases. Two methods are applied : immunoenzymatic (ELISA) and biological (indexing) test.

4.3. Various controls

Plants must be subjected to inspections in storehouses, during their distribution or after their establishment in the farms. In this respect, the nurseryman shall make a register available for the DPVCTRF (Service du Contrôle des Semences et Plants) stating the number of plants produced and marketed, dates of sale, and names of buyer, and place of destination of the plant material.

Plants must be cleared before marketing. The nurseryman must contact the Service du Contrôle des Semences et Plants, agency issuing a label on each plant.

The red label identity card carries the following informations:

- species;
- variety/clone;
- rootstock;
- lot number.

The lot number indicate the year, area of production, and the number of the producer assigned by the Service du Contrôle des Semences et Plants.

To conclude, it must be underlined that certification applies only to plants of varieties registered in the catalogue of species and varieties cultivated in Morocco or in the provisional list of varieties to be certified (this list includes the major varieties grown in Morocco. It falls into decay with the establishment of a list in the official catalogue).

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