



**FACULTY OF AGRICULTURAL SCIENCES & ALLIED INDUSTRIES**

The ultimate success of an orcharding enterprise largely depends upon the quality and genuinity of planting materials as nursery plants are the foundation of the orchard. The variation of scionwood and rootstock has great bearing on the productivity of an orchard. Thus, it is of immense importance having all plants carefully labeled or otherwise marked. The whole process involves various steps as mentioned under:

**Selection of mother trees****Creation of budwood bank**

Maintenance of budwood bank/ repository of improved high yielding and commercial cultivars of different fruits at a central place, preferably at the major production areas of respective fruits under the supervision of university/ department for raising of mother blocks/ trees for further multiplication.

**Selection of varieties:** The identification and listing of cultivars to be propagated is very important. After listing the cultivars, their meritorious plants are to be selected, which give regular yields of high quality fruits and are marked for further study/use as budwood source.

**Indexing of viral diseases:** The progeny plants are the major source for the spread of viral diseases. There are reports available where in apple mosaic alone has been responsible for reduction of 40 per cent yield and 50 per cent productive life. The bud take success in temperate fruits is also low in affected trees. Thus, the selected meritorious trees should be indexed for virus and then categorized accordingly. The parent trees showing abnormality in characters with passage of time should be discarded from the progeny orchard.

**Maintenance of mother trees:** Identified mother trees are used to develop progeny hedges in large number near to the nursery site at 2x2m distance. The hedges are properly labeled and used for scion wood. Progeny trees are heavily pruned to produce scion wood in bulk. Adequate plant protection measures are also adopted to keep these progeny hedges free from the insect/pests and diseases. Such practices of maintaining scion/mother tree hedges are common in various advanced nurseries in overseas countries. Old trees of selected varieties can also be pruned severely to develop forced shoots to be used as scion source, in the orchard site only till progeny hedges are developed.

**Collection and Handling of Scion Wood**

### For dormant grafting

- The scion wood in winter is to be stored for considerable long time. The labels and identification marks of scion wood should be considerably durable.
- Storage under moist conditions or underground needs rot proof labels and the attachments.
- Non-corrosive zinc metals have proved excellent for this purposes, provided the wire or other connection is rot-proof.
- Painted wood labels or zinc labels with pliable wire are satisfactory for most purposes.
- Bundles of budwood are tied firmly and labels are attached in such a way that they may not slip along and off the ends of scion material. Even the best method of labeling should be supplemented by notes in the gardener nursery book.
- The best method of storage of scionwood is to burry deep in soil with more packing in shady location. It also helps in completion of chilling requirement of the scion wood.
- Storage can also be done in cool chamber at 0-2<sup>0</sup>C but in this case budsticks are kept in well packed condition in moist sphagnum moss.

Disinfection of scion wood: To check the infection accumulated during storage, the scion wood prior to use after storage should be treated with insecticides like chlorophyriphos, tree spray oil and fungicides based on captan, dodine, etc. at convenient concentrations.

Scion for bud-grafting (Budding):

- For summer or autumn budding, shoots are collected, at the time suitable for the operation, from healthy selected progeny plants or hedges of chosen variety.
- It is usual to remove the leaves immediately to reduce water loss. This is done by severing the petiole about 12 mm from its base.
- The soft tip of the shoot may be removed. These defoliated shoots or bud sticks, may be kept in good condition for some days in a cool place. The stipules in many cases abscise

after a few days but this is more a sign of viability than detriment and sometimes budger prefers to handle this type of material.

**Transport of budwood:** To long distances, the budwood should be air transported. The weight of consignment may be kept down by reducing the length of bud sticks to contain only the best buds. Bud sticks are first wrapped closely or heat sealed in thin 50-gauge polythene, no internal packing is used. The wrapped scion wood is then covered with an outer wrapping or waxed for protection against bruising and to receive the address label and any necessary permits.

**Petiole retention or removal:** The petiole base adhering to the scion wood serves as a convenient handle for grafts in the budding process but it appears to serve no other useful purpose. In subjects having large petiole base, it may prove to be disadvantageous and should be removed. It may be noted that there is no difference in success of petiolated or unpetiolated buds.

**Handling of rootstock:** There is a wide variation in the rate of growth of various seedlings sown after [stratification](#) or pre-sowing treatments. In general, only the most rapid growth will enable transplanting to take place after one season and two years in the seed bed is more usual.

**Grading and rouging:** Out of the nursery is necessary to lessen seedlings variability problem. This practice is common in various advanced countries. Unfortunately, no care is given to this aspect in our country, and probably the variable planting material is also one of the causes of low productivity in horticultural crops.

### **Nursery Registration ACT**

For producing certified nursery stock, the fruit nurseries shall have to maintain a scion block, a seed block, and stool bed and shall have to use the propagation material only from these sources. The scion block means a planting of registered trees which serves as a source of scion wood for the propagation of certified nursery stock. The seed block means a planting of registered seed trees which serves as a source of seed for producing seedling rootstock for use in propagation of certified nursery stock. The stool bed is a mean of planting of self rooted registered mother trees/ mother stools which serves the specific purpose of producing vegetative propagated (clonal) rootstock used in the propagation of certified nursery stock.

Supply of poor quality nursery plants is one of the major causes for low productivity of horticultural, plantation and other crops in our country. Government of India had constituted

model nursery regulation act long back in 1954. On this analogy different state governments have also enacted their own state nursery registration acts depending upon the available crops and local requirements to ensure availability of genuine planting material for farmers. For instance; the Himachal Pradesh fruit nurseries registration rules have been framed vide Act No. 15 of 1973. As per contents of act an application for a license to establish a fruit nursery shall be addressed to the competent authority in Form 'I' along with a treasury Challan in original of Rs. 100/- in favour of concerned state Director of Horticulture, in any Government Treasury /State Bank of India. After completing all codal formalities laid down in the act, the license is initially issued for a period of 3 years and can be extended further after submitting renewal application to the competent authority 90 days before expiry of earlier issued license. Unfortunately, despite nursery registration act, local unauthorized nurseries are mushrooming in every area, which merely follow the rules and regulations. Poor or inadequate inspections by the agencies also favour them. A nursery should be registered for the purpose of providing quality seed, rootstock and scion sources. A nursery stock should be inspected, tested for genuinity to type, freedom from viruses, insect-pests and diseases.

#### **Licensing requirements of nursery:**

1. Any person/ person (s) engaged directly with the distribution of plants, plant products, plant material, nursery stock is required to inform the department, the existence of progeny plants and their operations. He/she should obtain a nursery industry license prior to initiating such business.
2. The aforesaid firm or individual(s) are required to renew their nursery industry licenses, each year or every third year as per local nursery act in order to continue the business.

#### **Inspection of nurseries and nursery stock certification**

- After receiving the nursery industry license application, the department or its representative shall examine or inspect all plants, plant material, or nursery stock located or grown on the business location or any other applicable location.
- The department shall conduct inspection yearly or at any time as it deems the best, with or without notice.
- After successful completion of an inspection, the department shall issue a nursery stock certificate to the licensed nursery.

#### **Responsibility of the applicant:**

The applicant nurseryman shall be responsible, subjected to approval by the department, for the selection of the locations and the proper maintenance of registered plantings being grown. The nurseryman should maintain register regarding time of different operations/applications, nursery stock of different varieties of a crop, in a manner approved by the department.

### **Location of planting**

The planting location shall be subject to approval by the department and shall be in an area having minimum risks for spread of infection, pests by drainage, flooding, irrigation or other means. The fruit tree nursery stock being grown shall be on rootstocks approved by the department and shall originate from the registered seed trees or from registered stool beds. Certified nursery stock should be produced on soils that have received a pre-plant nematicide or that were sampled before planting and found to be free from virus, vector and nematodes. Nursery stock meeting the requirements, when sold, shall have the variety, interstock and rootstock designated, where applicable.

### **Refusal, suspension or cancellation:**

Registration or certification may be refused, suspended or cancelled for any plant in part or all of a planting stock under any of the following conditions:

- If nursery is not working as per the standards prescribed by the rules and regulations of state government or Government of India.
- If the plants are found to be virus infected or there are off-type plants in the nursery.
- If a registered mother tree is found virus-infected after periodic indexing.
- If the pest control requirements are not followed properly upon inspection.
- If the plants have not been properly maintained.
- If the registration number is misused.

### **Civil penalties:**

The civil penalty for violation of any section of act not already stated will be the assessment of a civil penalty, the confiscation or destruction of any and all plants, plant materials or nursery stock found on the premises or contained in the shipment in question and /or suspension or revocation of the current nursery industry license or any future operation privileges granted under the act.