

## ESTABLISHING AND MAINTAINING A SEED ORCHARD

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The primary purpose for establishing seed orchards is the genetic improvement of plants that are usually propagated by seed. In addition to improved quality and quantities, seed produced in orchards greatly reduces the cost of collection and insures a more dependable, consistent source with known parentage.

**Site selection.** Northeast Missouri offers a favorable climate for a wide range of deciduous species. Although temperature extremes can range from a high of 115°F to a low of -22°F, the climate is favorable for plant growth, flowering and fruiting. I selected a site that was elevated above surrounding terrain because it offered good air drainage. This is desirable to reduce the danger of late frost damage to flowers and fruits. A deep, well-drained soil is preferred to produce healthy, vigorous growth which favors heavier seed production. Rolling terrain with strips of native tree growth can offer protection from strong winds and also serve as a barrier to eliminate unwanted cross pollination between closely related species.

**Site preparation.** An established bluegrass sod meadow, that had been improved by the addition of limestone and commercial fertilizer for a period of years, resulting in high organic build up, served as a planting site. Bluegrass is preferred above other grasses because it is easy to maintain and less competitive. This is particularly important in dry summers when it becomes dormant, thus increasing moisture available for the orchard plantings.

**Plant selection.** Plant selection is by far the most important aspect of seed orchard establishment. Many species take from a few years to as many as 20 years to produce seed so care must be exercised to make sure only true-to-name, top quality, disease-free, vigorous plants are used. Careful selection of the more vigorous individuals can result in marked genetic improvement of their progeny. Interplanting individuals of the same species from a different seed source with the same selection criteria is beneficial, and results in hybrid vigor and more pronounced genetic improvements.

Late flowering and heavy fruiting characteristics are important considerations when selecting planting stock. Care must be exercised to make sure species planted will produce viable seed in the selected location.

**Planting.** Actual planting is done primarily in the early spring, usually March and early April. Results have shown early planting improves survival and first year growth. To insure the earliest possible planting, preparation starts in the fall. A 3 foot wide band, the seed row, is treated with Paraquat in the fall, usually mid to late October. After sufficient kill is observed, the planting holes are marked. Holes are augered with a conventional tractor post hole auger, 18" in diameter. Holes are dug in both fall and spring depending on soil conditions and general work load.

The distance between rows and plants was designed to provide a uniform system for ease of maintenance and efficiency while achieving maximum production. Maximum efficiency and production is realized by having a hedge row at fruiting age. Most flowering shrubs and small trees are planted 6 to 8 ft apart and larger growing trees are spaced 12 to 18 ft in the row. The distance between hedge rows varies from 18 to 24 ft depending on the species and the orchard maintenance plan.

**Maintenance.** Maintaining a seed orchard is costly but a must if it is to return its full potential. Weed control is accomplished by repeated sprayings of Paraquat, using a small off-set nozzle, to maintain the 3 foot planting band until such time that the hedge develops and dominates most of the weed competition. Mowing between rows is done as required to minimize competition and stress. A standard bushhog is used.

Roguing is important to remove undesirable or off type plants and to remove stray woody plants that invade existing hedge rows.

Pruning is an important management practice in a seed orchard. Old wood that loses seed-producing potential should be removed. Pruning care also facilitates seed collection by maintaining individual plants and hedge rows in a form and at a height that permits easy fruit harvest.

Fertilization of the seed orchard is practiced with two programs: For new plantings not yet producing fruit, a program designed for rapid vegetation growth is followed. Five hundred pounds of 24-12-12 per acre is broadcast over the entire area in winter followed by an individual application of ½ lbs of 24-12-12 per plant around the base of each plant in early summer. Fruiting plants receive the same number of pounds at the same time; however, the analysis is changed to 12-24-24 to promote fruiting instead of vegetative growth. Other maintenance demands, such as insect and disease control, and wild life damage, must be recognized and handled on a continuing basis.

A seed production program can have an important impact on a propagation program. Having known seed sources that will remain consistent from year to year is extremely important to a production program. Like any other production system, seed production must be treated as an important part of a total nursery growing program.

RALPH SHUGERT: Have you tried pruning 6 to 8 year old viburnums to the ground instead of your normal method of pruning about 50%?

ROBERT LOVELACE: I have not tried that because I felt I would get a quicker return to production my way.

RALPH SHUGERT: I would suggest that you take a few plants of *V. prunifolium* or *V. lantana* and make a comparison.

## PROPAGATION AND GROWING OF THE CHINESE PISTACHE<sup>1</sup>

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**Abstract.** Germination percentages of Chinese pistache (*Pistacia chinensis* Bunge) seed ranged from 63 to 92 percent after 60 days stratification at 40°F (4°C) compared to 0 to 24 percent when sown directly without chilling. T-budding performed in August was more successful than in May. Softwood cuttings taken from juvenile shoots of seedlings and treated with 0, 5,000, 10,000 and 20,000 ppm IBA rooted at all hormone concentrations, but cuttings from older trees were unsuccessful.

### REVIEW OF LITERATURE

The Chinese pistache (*Pistacia chinensis* Bunge) is an ornamental member of the Cashew family, Anacardiaceae (7). The name, pistachio, is generally reserved for the edible species, *P. vera*, which is not as hardy and is occasionally budded on rootstock of *P. chinensis* in California (1,8), but, more often, on *P. atlantica* or *P. terebinthus* (6). The Chinese species also has excellent heat and drought tolerance (2) and thrives in regions of long, hot summers but needs moderately cold winters to satisfy its chilling requirement (7). Chinese pistache is widely grown in California and has been suggested as a tree for desert and seaside plantings in the southwest and Gulf coast areas (1). It has proven hardy throughout Texas, Oklaho-

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