Nursery Seedlings

improved methods of production possible with control of damping-off disease

Kenneth F. Baker

New mechanized production techniques are being developed and adopted in the growing of seedlings because the damping-off disease now can be practically eliminated in commercial nurseries.

The proper treatment of the soil, and of seed in some cases, coupled with reasonably careful handling to avoid recontamination, is becoming an integral part of production of vegetable seedlings for farm planting, and of bedding stock for sale in flats.

To free the soil of pathogens, it should be uniformly steamed to 180° F for 30 minutes, preferably in the flats to be used. Seeds which carry organisms that cause either damping-off or diseases of mature plants should be treated to kill the parasites.

Careful utilization of these basic procedures has made possible striking improvements in mechanization of pepper seedling production in a southern California nursery and some of the methods developed should be applicable to other types of crops.

Methods of Handling Soil

The soil mixture consists of: 1. A light sandy loam as free as possible of fine clay; 2. Canadian peat, and 3. commercial fertilizer, blood or fish meal.

Natural manures or leaf mold usually are not used. Such a simple mixture is dependable, can be duplicated, does not break down under steaming, is practically free of excess soluble salts and has desirable characteristics of drainage, aeration, and breaking away from the roots on pulling.

The soil components are conveyed from the various storage piles by a moving belt, are blended in a large concrete mixer and brought to the proper moisture level before being dumped into a mechanical flat filler. The filled flats are placed on wooden pallets and transported to the soil pasteurizer and through the various steps by a fork-lift truck.

Methods of Seed Treatment

Although the Rhizoctonia fungus is carried internally in pepper seeds, it can be killed by a simple hot-water treatment without reduced germination. The seed is placed in cheesecloth bags which should not be more than half full, and is then immersed in a deep sink or tub containing at least 30 gallons of water held at 125° F.

The temperature is most easily maintained by allowing hot water—140° F–150° from a water heater—to trickle in during treatment, with frequent thorough stirring for uniformity. The bags should be kneaded early in the treatment to get rid of air bubbles. After 30 minutes they should be removed, quickly submerged in cold water until cool, and then drained.

The seed is spread out in thin layers on screens to dry either outdoors in warm weather or in a heated room with fans, but drying must be completed within 12 to 20 hours.

Planting and Germination

Because the number of plants is not reduced by disease, seed is sown in place in the flats by a patented vacuum-plate planting machine. For the same reason, it is possible to maintain the flats at a high moisture level during germination.

Immediately after the seed is planted in the flat and covered, first with thin tissue paper and then sterile sand, it is rather heavily watered. All of these processes are handled by machines at the rate of 150 flats per hour. These flats then are stacked and moved into a closed room held at fairly constant temperature and high humidity. Under these moist conditions the seeds germinate uniformly and shed the seed coats without the sticking or binding common under dry conditions.

The flats are removed from the germination room and placed on greenhouse benches just after emergence, but before the seedlings elongate.

Greater uniformity and percentage of germination is thus obtained while avoiding the laborious watering required for seed flats. The greenhouse benches are not used during the seven- to 14-germination period, and are available for plants which require light. This method of germinating seed flats under conditions free of pathogens is now successfully used by several nurserymen and seedsmen in California and the mid-West. It has been found useful when a single variety is sowed in numerous flats but not when several varieties are involved, because of differences in germination rate. This

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Olive Yields

studies underway to determine causes and correction of irregular bearing

H. T. Hartmann

Reduced yields of oil olives the year following the season when the fruit is harvested late—in January and February—were indicated by studies made in Tulare County several years ago.

To expand the studies, an experimental plot was established in 1947, in Butte County.

Trees were harvested October 21, 1947, and January 2 and February 23, 1948.

Oil content determinations were made of fruit samples harvested on these different dates. It was found that as the harvest was delayed the oil content increased.

These same trees will be harvested at approximately the same dates for several years and yield records and oil determinations will be obtained. This should show the extent to which late harvest depresses yields.

The first visible cause of a poor crop—nonbearing, irregular bearing, or alternate bearing—is the excessive production of staminate or male flowers which do not develop into fruit but drop soon after bloom. Two approaches are being tried at this time to overcome this trouble.

One is girdling branches in December; the other is applying hormone sprays in early spring. When the plots are harvested this season, the value of girdling and hormone sprays in olives will be known and a complete report will be made.

Variety Studies

A variety collection has been established for variety studies and in contemplation of an olive breeding program.

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