

# Commercial Peach Tree Production (draft)

*Prunus persica*

By

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## Summary

The seed are planted in October-November. Seedling rootstocks are T-budded in June. The trees are barerooted/harvested during their first winter. They can be 2-5 feet tall. It is a 13 month crop. It is impossible to follow peaches with peaches.

## Seed Source

Seed come primarily from canneries. It is best to obtain seeds from the current season's crops, since viability decreases with each year of storage. (The seed may also be referred to as pits.) Truckers frequently back-haul the seed back to middle Tennessee from various canneries. (A hobbyist can use any seed available.)

## Number of seed per bushel/Number of marketable trees per bushel

In summary of the following section:

156 cleaned seed per pound on avg.

There are 4000-5000 peach seed per bushel.

Bud 3000 per bushel. 30,000-36,000 or 12,000-15,000 budded/ acre.

10-12 bushel planted per acre.

A 70 percent bud take is average.

Market 1300-1500 trees per bushel on avg.

A telephone survey of 4 experienced commercial peach tree producers was made. Landon Arnold told me there are approximately 5000 peach seed per bushel; that it is usually possible to bud 3000 of them and to market 75-80 percent of the 3000. That figures to 2250-2400 young peach trees per bushel of seed.

Mike Vaughn expects 1500-2000 seed to germinate per bushel. After bud losses and culls, he expects to market 1000 young peach trees per bushel of seed.

I.D. Adcock expects 4000-5000 peach seed per bushel; 10-12 bushel planted per acre; 12,000 - 15,000 budded per acre; an average bud take of 70 percent.

Jimmy Barnes estimated 1500 marketable trees per bushel.

Note: This information was received over the phone, from the top of their heads. There is no such thing as an average production year. Seed size varies with the weather, the year, the source. Seed size affects number per bushel.

## **Rootstocks**

Seeds of 'Halford,' or 'Lovell' are usually used, since they germinate well and produce vigorous seedlings. Nemaguard seed/rootstocks are resistant to root-knot nematode. Peach orchards plant peach trees budded onto Nemaguard rootstocks if they have or suspect a root-knot nematode population.

Lovell is a clingstone peach, grown primarily in California and South Carolina for seed. Lovell is not a good peach from an eating standpoint, but is the dominant seed used as a seedling rootstock source at this time. Halford is a canning clingstone of unknown parentage. Halford seed have been used as a seedling rootstock since 1921.

Guardian is gaining popularity in the Southeast for its better survival on short-life sites. Guardian (BY-529) was developed by USDA and Clemson University strictly for use as a rootstock. Demand exceeded supply prior to 1998. Germination was 30-35 percent compared to the other rootstocks initially, with nurseries trying different storage conditions. "Germination improved dramatically by 1999, with producers desiring to plant more. Guardian germinates 3-5 days earlier than Halford.

Lovell seed are getting scarce and costing \$0.07 each. Guardian seed are \$0.15 each. Halford seed costs \$300/ton or \$0.15/pound; with approximately 80 seed/lb."<sup>(5)</sup>

Nurseries continue to try different treatments to improve germination. Peach tree nurseries like the demand for the rootstock, but are concerned with the dismal germination, as the seed are very expensive.

## **Fumigation**

Fumigation kills most weed seed, plant pathogens and soil insects. It is highly recommended for successful peach tree production. It must be done prior to planting the seed, while the soil temperature is still above 55-60 degrees F. A week or two should separate fumigation and planting to allow sufficient time for the gas to dissipate.

Fumigation can kill the beneficial mycorrhizae soil fungus that is extremely helpful in aiding the uptake of moisture and nutrients, especially phosphorus. Be sure the available phosphate level is medium to high (preferable high), prior to seeding. Fumigation cost approximately \$1500 per acre in 1998, but a commercial applicator may reduce the price to \$1250 if several acres are done. Several licensed commercial applicators are available.

## **Fertilization prior to planting seed**

UT soil test recommendations will encourage adjusting the pH to 6.5 and applying sufficient phosphate and potash to provide at least a medium level of availability and hopefully a high level. Phosphorus availability is very critical in the nutrition and growth of peach trees, especially following fumigation. Apply dolomitic lime instead of agricultural lime, if available, to provide magnesium. Without a soil test, some producers will sidedress 0-20-20 after planting the seed.

According to Dr. Steve Bost, the soils in this part of Middle Tennessee tend to be deficient in Zinc. Zinc is less available at pH greater than 6.1 and high phosphorus. Peaches have a low to moderate need for zinc. Symptoms remind me of iron deficiency. Corn producers have their fertilizer dealer bulk blend zinc sulfate in and they broadcast it prior to planting. P&SS Handbook recommends 5 lbs. zinc (approximately 15 lbs. zinc sulfate) per acre in lieu of soil test for corn, especially where deficiencies were observed the previous year. Steve recommends 5 lbs/100 gallons, with 20 gal of that solution sprayed per acre with boom sprayer prior to planting, (1 lb/acre). This rate can be foliar sprayed as a rescue treatment during the growing season.

### **Planting**

Seed are planted by hand or with a home-made peach seed planter in October-November. They are covered with approximately 2 inches of soil. Seed can be soaked in water for 72 hours prior to planting, in case fall moisture is light. Floaters are bad. Germination occurs in the spring.

Spacing may depend on the availability of seed, past experiences, and the expected germination percentage of the seed. 8-18 seed per foot is common. 10-14 seedlings per foot is ideal.

### **Budding**

Budding can begin in late May, depending on plant growth (the year) and continue through June. Three people are involved. The scratcher moves ahead of the budder. The scratcher pulls any weeds out of the way, thins the seedlings if desired, removes the lower foliage and any soil from the lower stem by sliding a hand down the stem. A wrapper follows the budder, tying the bud with a flat rubber band. In 1995, contract labor was paid 6-7 cents for each bud placed. The team of 3 shared this money. The team is frequently a budder, wife and child.

The T-bud method is used. The bud is inserted 3-4 inches above the soil on the west or south side of the seedling to help draw the bud out. The wood shield is removed from the bud before inserting. A T-cut is made on the seedling, the bud inserted and tied with a flat rubber band.

For years, budders would break the seedling top over 'to knock the sap back' as the plants were counted at the end of each days budding. Now, approximately half of the seedling is cut off instead. This is done to stimulate growth in the budded area of the seedling. (Or as the producers say, "to knock the sap back; to throw the energy to the bud".)

The bud should begin growing 10-14 days later. The seedling top is cut just above the bud and the cut is slanted away from the bud. Sunlight disintegrates the band and it falls away. After the bud has grown 8-12 inches, the suckers are removed and then as needed. Three trips through the field will be made to remove suckers. The trees will grow 2-6 feet before frost, depending on moisture, nutrients and the variety.

Note: Most producers are concerned greatly with bleeding. Some producers are concerned with the harmful effects of bleeding if they cut them back during several days of daily rain. They have seen the sap flow excessively during those conditions and the sun then cooks the sap and the bud, killing the top 1-2 inches of terminal. To avoid this, during this type of weather, some producers will make the cut 3-4 inches above the bud and return several days later to make the proper cut. (Arnold, 7-99)

### **Source of budwood**

Large nurseries obtain budwood from commercial peach orchards in other states. They have the different varieties and their trees are young, healthy and sprayed routinely. Phillip stated that Cumberland Valley Nsy. could probably get sufficient budwood from 2000 trees.(5)

### **Collection and care of bud sticks**

Buds sticks are gathered in the early morning and stood in a few inches of water in 5 gallon buckets. The leaves are cut off with a sharp knife, but a portion of the petiole is left to be used as a handle. The buckets may be placed in the shade, cooler, or cold storage, especially when held until the next day.

Only a few sticks are taken to the field at a time. A few bud sticks are wrapped in damp newspaper, and stood in the buckets until needed. Budders have various ways of carrying one of the newspaper wrapped bundles while they bud.

### **Fertilization after budding**

UT's recommendation: Two weeks after bud take and the seedling tops cut back, sidedress with Calcium nitrate or Sulfur-coated Urea (SCU). The constant release of the slow release Nitrogen in SCU or Osmocote is expected to provide a more constant growth rate. Sidedress Nitrogen at the rate of 50 pounds of actual Nitrogen per acre at each application. Calcium nitrate is not a slow release form of nitrogen.

The second application should be made 3-4 weeks later, but the producer must continually monitor the growth rate and make the application when the growth is noticed to slow down.

Moisture is a critical factor in the success of the calcium nitrate and other fertilizers. Irrigate after each sidedressing, and as needed to promote an even growth rate.

When budding is done early, there may be time for a 3rd application; but don't apply nitrogen after August 1st.

**NOTE:** The addition of phosphate and potash will not benefit growth during June - September, only nitrogen. Be careful not to apply too much nitrogen and burn the roots.

Fertilizers that provide 50 pounds of actual Nitrogen per acre:

330 lbs. Calcium nitrate (15-0-0) or 2 cups per 100 row feet.  
125 lbs. Sulfur-Coated Urea or 2/3 cup per 100 row feet.  
125 lbs. 40-0-0 Osmocote (3-4 month) or 2/3 cup per 100 row feet.  
360 lbs. 14-14-14 Osmocote or 2 cups per 100 row feet.  
250 lbs. 20-10-10 or 1.5 cups per 100 row feet.  
333 lbs. 15-15-15 or 2 cups per 100 row feet.

The Standard Nursery Practice, irregardless of UT Extension's recommendation based on research, is to sidedress with plenty of 15-15-15, or similar N-P-K farm grade fertilizer. A good peach tree producer has sidedressed with 1000 lbs. 13-13-13 with minors for years.

### **Weed control**

The standard nursery practice has been with fumigation and limited cultivation. Several preemergent and postemergent herbicides are labeled. Refer to UT Ext. Pub. #1226, "Weed Mgt. in Ornamental Nursery Crops".

### **Harvesting**

The plants are barerooted with a bareroot attachment on a tractor while dormant. They are graded and stored until shipped.

### **Storage of the bareroot trees**

Storage is commonly in packing barns with no temperature control except perhaps some heat during extremely freezing temperatures outside. Roots are kept damp. A few producers have cold storage to keep the plants dormant and in good condition.

Marvin Tieman, a partner at Cumberland Valley Nursery at the time, shared this information in his presentation at the 1989 Tennessee Nursery Short Course. His talk concerned the storage of all bare root fruit trees, not just peach.

"Proper planning for the storage of bare root fruit trees starts back in the summer before plants are dug in the fall. The amount and timing of fertilization is very important in determining when a fruit tree will go dormant and can be safely dug. If fruit trees are fertilized late they often will not go dormant until late. This makes it very difficult to dig, especially during a warm fall.

The two most important factors in the successful storage of fruit trees is waiting to dig until the trees are completely dormant and void of foliage. If they are dug while the sap is still up and the leaves still on the tree; the tops will likely burn, regardless of the efforts to prevent it. They frequently will die all the way down to the bud union. All fruit trees, and especially *Prunus*, must be rid of all leaves before they are brought into the packing shed.

There are ways to speed defoliation. We run the bareroot blade under the trees approximately 2-3 weeks prior to harvesting. This knocks the sap back and prevents any new growth. Once the bareroot plants are pulled from the soil, they are taken directly to the shed and water sprayed on the roots. They are not allowed to lay in the sun or wind to dry out.

Trees are graded and tied into bundles. They are stacked on steel racks or wooden pallets, making sure that they are off the ground. The floor of the packing shed is dirt with a light coat of small gravel. This helps to eliminate mud, while still allowing the lower trees to pull some moisture from the ground.

It is best not to attempt storage in a packing shed with a concrete floor. The concrete will pull moisture away from the plant. If there is no choice; raise the plants above the floor and keep the floor damp (to wet).

The trees are stacked with their tops to the center and their roots exposed around the edges of the piles.

While in our storage at Cumberland Valley Nursery, we spray the roots with water 1-2 times per week, depending on the need. We strive to spray the roots and not the tops. The method of stacking helps keep the tops dry. Dampened tops are more likely to mold.

A back-pack mist blower is used to spray a general fungicide, (Daconil, Captan, Cleary's 3336F), weekly. It is very maneuverable between the stacks and does a good job for us.

Large fans mounted on the ceiling run all the time. They keep the air circulating and we believe helps prevent mold on the plants. During extremely warm periods, the cooler is turned on. It is important to keep the temperature below 45 degrees. We prefer 38-40 degrees.

The storage of fruit trees requires proper planning and some experimentation, as to what works best. Plan the air circulation, insulation and cooling thoroughly before construction. Proper planning and a little cooperation from Mother Nature can make the storage of bare root fruit trees successful."

### **Tennessee Production**

There was an estimated 5-7 million peach trees budded in Middle Tennessee in 1999. There was an estimated 3 million budded by Vaughn, HollyDale and Cumberland Valley. (5)

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