Planting and Training Peach and Nectarine Trees

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draft February 25, 2015

Adapted in part from "Peach Culture in Michigan" by Stanley Johnson and R. Paul Larsen

Most Michigan peach orchards are now planted approximately 18 - 20 feet x 10 - 14 feet. Y style orchards are commonly planted at 5 – 7 X 18 feet. This requires more trees per acre with larger yields in the early years.

Planting

Planting should be done as early on the spring as the soil can be prepared. Early planting is desirable because it gives the trees more time to become established before heat and dry conditions occur. Prevent the roots from becoming dry before planting. Trim off damaged ends.

Prior to planting, soil tests should be made from the various soils in the orchard. Lime, as well as other required nutrients other than nitrogen should be added and worked into the soil prior to planting. If the soil is rather light, the addition of soil, well supplied with organic matter, into the tree hole, will be beneficial; however, peat should not be used alone but should be mixed with at least half and half with the soil present in the field. If the soil is heavy and less well drained than desirable for peaches, consider building a slight berm before planting with the use of a vegetable bed shaper or repeated passes with a plow. Fertilizer should not be placed in the tree holes because trees can be killed by this practice. The use of a liquid fertilizer starter solution in the tree hole has sometimes given poor results. It is better to apply a small amount of fertilizer in a band around the tree about two weeks after planting, if needed. Multiple small applications of nitrogen fertilizer will help to reduce leaching in lighter soils. If the soil is reasonably fertile, no fertilizer may be needed the first season.

The tree should be planted deep enough so that the bud union is about 2 inches below the surface of the soil. Trees are often planted either too shallow or too deep. To prevent the roots from drying after planting, the soil should be well-firmed about the roots during the planting operation. Care should be used to work the soil under the crown to avoid leaving an air space. Shaking the tree up and down two or three times during the planting process helps distribute the soil around the roots.

If exceptionally dry weather prevails following planting, or if the soil is dry at planting, young trees should be watered. A nurse tank with hose can be used to add water to the planting hole before the hole is closed. Peaches planted in sod have shown considerable benefit from irrigation the first year. Overwatering with trickle systems and heavier soils can lead to tree decline due to soil pathogens.

Replanting

Immediate replanting of peaches on land that has just grown peaches may give poor results. A soil building program for a year or more may be very helpful before replanting. Rye, Sudan grass, or other fibrous crops should be grown and plowed down to help increase organic matter for the new orchard. In some orchards, where nematodes have been a problem, it may be necessary to treat the soil with a fumigant before replanting.

Compacted soils should be ripped with a chisel plow or subsoiler to remove old roots and break-up hardpans created by travel and tillage in replant sites. This is best done during the driest part of the year prior

to replanting. If a soil building program is not possible, it is advisable to bring in new, fertile soil to place in the tree hole when replanting trees.

Best Time to Prune Young Trees.

Young peach trees should not be pruned in Michigan until after mid-March or early April in the more northern peach areas because the peach canker disease (Leucostoma / Valsa) is more likely to be spread by earlier pruning. Treatment with fungicides registered for brown rot control right after pruning and before rain occurs may help to reduces canker infection.

The peach tree is naturally inclined to form an open-center. Other systems used in Michigan are central leader, Y system, and quad. In general, at planting remove all badly damaged limbs, remove all limbs below 1.5 foot height.

The major scaffold structure of the peach tree is built during the first 3 or 4 years of growth. Care and planning is needed to avoid leaving limbs on the main trunk and lower scaffolds regions that will need to be removed with large cuts.

Open-Center Method

All trees should be headed high enough to permit necessary cultural management (cultivation, weed spraying, etc.) under the trees. There is some difference of opinion among peach growers regarding the height to head the tree. Heights vary from about 18 to 36 inches. Lower-headed trees are easier to prune, thin and harvest. High-headed trees carrying a crop are more susceptible to injury from strong winds. More trunk area is exposed to the sun in the winter, which results in more of what is known as 'southwest injury'. The bark is often severely damaged from the effects of alternating high temperatures in the day and freezing temperatures at night. High-headed trees are likely to sway in the wind causing openings to form between the trunk and the soil. Water accumulates in these openings in the fall and winter. Ice formation in these openings can seriously damage the trunk.

Selection and Pruning of Scaffold Limbs. Three to five main scaffold limbs can be used, with 3 or 4 being best. If more than 3 scaffolds are kept, they should be distributed around and up the central trunk and far enough apart so that they will not grow together later. They should be especially well-spaced around the trunk. If scaffolds touch each other, a sharp angle is formed. The bark does not knit properly in the area and canker are likely to develop. It is okay if only two suitable limbs are available because a side limb arising on one of these can serve as a third scaffold.

The length to leave the scaffolds at the time the tree is planted will depend upon their size and uniformity. If they are large and uniform in size they can be left 10 to 12 inches in length. If they are rather slender and uneven in size, it would be better to cut them off to short stubs an inch or two long. New shoots will develop from the basal buds and the best of these can be selected the next spring for main scaffold limbs.

Spring-type clothes pins can be used to insure more horizontal crotch angles on newly developing sprouts arising from the trunk. Attach a clothes pins to the central leader over the sprout when 3 to 5 inches long. Remove the clothespin 3 to 5 weeks later when the branch has stiffened sufficient to stay in place by itself. In the older tree, weights and spreaders that do not injure bark can be used in the planting to insure strong, wide scaffold angles.

A common approach in Michigan is a three scaffold tree where the three branches originate at about the same level but spaced more-or-less equally around the top of the trunk. If possible, leave an open area (between two scaffolds) toward the prevailing wind (usually the southwest) to avoid upward bending of a major scaffold by the wind.

Excess scaffolds should be removed in the spring of the second year, and again in the third and even later. Do not allow excess scaffolds to remain in the tree two or three years and then remove them. The resulting pruning cuts will be too large to heal properly. Remove excess scaffolds each year. It is likewise important to remove all growth from the trunk below the scaffolds and from the crotch area of the scaffolds to reduce possible points of breakage or other injury and subsequent entrance of peach canker.

The scaffolds selected should have wide angles with the trunk at the point of attachment. This is very important. Scaffolds having sharp angles at the point split off the trunk easily. Also, bark and wood unite poorly in this narrow area, marking them very susceptible to injury from low temperatures, and the entrance of canker-forming organisms.

It is better to have two wide-angled scaffold branches than three which may grow together in the future. Pinching out the terminals of unwanted shoots in early summer will assist in proper early training. It is recommended that corrective pruning be done in the spring of the second and third years. It is too late to do corrective pruning in later years. Allow a few side branches coming off the original scaffolds within a foot or two of the trunk to remain so that the entire tree has up to a maximum of eight upright major scaffolds. Closer spaced trees will require fewer major scaffolds.

Central-Leader Method

This method is a cone-shaped form, somewhat like a classic Christmas tree. Trees trained by the central-leader method should be somewhat larger than open center trees during the first three or four years because less wood is removed at the time of planting. Typical spacing for a central leader ranges from (20’ X 15’) down to (15’ X 10’). Trees larger than 5/8” caliper are less easy to work with because they may not have enough scaffolds in the right position or angle, and may be more reluctant to put out new growth in the desired locations. Smaller diameter trees without branches formed in the nursery are also very good to work with.

The goal is to form a tree with a strong central axis (central leader) with a swirl of 4 to 5 branches in the region of 24” to 48” from the ground with another weaker swirl in the 48” to 84” range for wider spaced planting. For closer spacings more scaffolds (6 – 8) with 12 to 18” between branches are needed to encourage smaller limb diameters. Tree height should not exceed 12 feet. The lower swirl is generally considered permanent and the upper swirl can be renewed by pruning. There is a somewhat similar training system called the fusetto that has the central leader shape but the lower swirl is not permanent and is generally planted at a higher tree density per acre.

Year 1. To develop a central leader tree, a well-branched tree from the nursery in the 1/2 - 5/8” caliper will get the orchard into production rapidly. Head the tree with a terminal bud facing into the wind at 40 to 50 inches from the ground and remove all limbs within 2 feet of the ground, and all very upright or severely damaged limbs. If the tree is of large caliper (> 5/8”) and/or suspected to be reluctant to grow, remove 1/3 of the limbs, and wait until the tree develops green tissue to see which limbs can be retained or removed. The potential scaffold limbs should be trimmed so that they are no longer than 1/2 - 2/3 the length of the leader. The length to leave the scaffolds at the time the tree is planted will depend upon their size and uniformity. If they are large and uniform in size they can be left 10 to 12 inches in length. Use spring-type clothespins to spread limbs to approximately 20 degrees above horizontal. If they are very slender and uneven in size, it would be better to cut them off to short stubs an inch or two long. New shoots will develop from the basal buds. Come back through in a few weeks and make sure the developing limbs have a single dominant sprout at the end.

Year 2 & 3. Prune between green tip and pink. Remove any branches that are dead. Remove any branches that are competing with the leader, and any that have strong upright growth. If the leader is weak, or has begun to lean with the wind, cut the central leader back to larger diameter wood with a branch into the

wind. Thin out weak wood, small diameter wood, or those pointing downward. Reduce the length of the scaffolds to 1/2 to 2/3 of the length of the leader, with branches closer to the top of tree being shorter in length. During the summer remove new vigorous growth that is competing with the leader and scaffolds, and begin to develop a second swirl of branches 2 – 3 feet above the first set.

Fruiting years. By this time the tree should have filled their allotted space. Use dormant pruning to remove dead wood, branches with canker. Thin out scaffolds and fruiting areas to improve penetration of sunlight into the interior of the tree. The leader may need to be removed to shorten the tree by cutting to a strong upper scaffold. If fruiting wood is generally short (less than 18 inches), use more aggressive cuts, and review nitrogen fertilizer program.

Side-Leader Method

Often for various reasons, newly planted peach trees fail to develop more than one good shoot. Some growers consider such trees as practically worthless and will replace them the first spring, if not too late, or will pull them out with the idea of planting another tree in the same location the next spring. By using the side-leader method of training, these trees can be developed into some of the best in the orchard.

To train the young tree by this method, one branch is selected, at the desired height for the head, which is as nearly horizontal in direction as possible and has a wide angle at the point of attachment to the trunk. This branch is headed back to 10 or 12 inches in length and all of the remaining branches are removed. It is considered better if the branch selected is on the side opposite the prevailing winds. If it is known beforehand that this method is to be used, a suitable branch can be selected and placed in this position during the planting operation. The reason for doing this is that the force of the prevailing winds blowing across the branch will aid in keeping it in more of a horizontal position. This will result in the scaffold branches arising from it having wide-angled unions at the point of attachment with the original side-leader.

During the first season, three scaffold branches are allowed to develop from the side-leader, retaining those that have wide angles at the point of attachment. Others should be removed as they develop. The pruning given during the second and third springs is somewhat similar to that given in the regular three-scaffold method already described. The problem is primarily to keep the scaffold limbs in balance until the tree is well established. To do this it is very important to keep the terminal scaffold as the leader. This can be done by pruning the other two scaffolds sufficiently to keep them slightly smaller. If this is not done during the first three or four years, the two scaffold branches nearer the trunk will have a tendency to grow faster and strangle the terminal scaffold, leaving a two-scaffold tree. If this should happen, a strong tree is still very likely to develop.

Despite heavier pruning on the side branches, the three scaffolds will be of nearly equal size when four or five years old. This is desired, for the more nearly equal the three scaffolds are in the size in the mature tree, the stronger the head and longer lived the tree.

The heads formed by this method of pruning are generally very strong. Instances of defective unions at the point of attachment of the scaffolds with the original side-leader are extremely rare.

The pruning given the tree immediately after planting by this method may seem to be unusually severe. Actually, however, it is no more severe than that given trees pruned to a whip or three short stubs, as is frequently done in the three-scaffold, open-center method. On the average, trees trained by the side-leader method should be as large as those trained by the three-scaffold method at the end of three or four years growth.

Only a light corrective pruning should be given in the second and third years. Main scaffold branches should not be headed back if they are reasonably well in balance. If one is considerably out-growing the others, it should be headed back to bring the tree in balance.

The small wood in the lower center part of the tree, but away from the crotch area, should not be removed as it is on this wood that the first peaches will be produced. If this wood is left on the tree, it will be possible to harvest a fairly good crop of peaches the third summer. This small wood can be removed in the spring of the fourth year as it will no longer be very productive.

The light pruning recommended for the first few years of a peach trees life is a wide departure from the method in commonly used years ago when it was thought that young trees should be pruned severely to insure the development of a strong tree. It has been shown that such a severe type of pruning does not create a stronger tree; rather, growth is reduced and production is delayed.

Specialized training techniques – Single and debud

The "single and debud" approach is to use your hand to remove all but the terminal bud from the top 3-4" of the branch end. The bud removal is done between bud swell and 1st bloom. Delaying the debudding time closer to bloom in peaches makes it easier to thoroughly remove unwanted buds, especially on the branch end. Peaches are much more prone to develop lateral branches than cherries, so the delayed budding in peaches is not a problem.

The advantage of the "single and debud" technique is a smooth juncture on the scaffold between last year and the current years growth. A scaffold trained by this technique is relatively straight as opposed to the "dogleg" appearance of the traditional headed scaffold. Side limbs arising on the scaffolds are relatively small diameter with relatively wide crotch angles, providing less opportunity for Leucostoma canker problems. Since there is no heading cut with this technique, tree size and limb calipers tend to be noticeably larger with the single and debudded tree compared to the traditional headed tree.

Trees trained by the "single and debud" technique tend to be more upright. On occasion it is necessary to use a heading cut to redirect scaffold limbs that are growing in the wrong direction. It is generally necessary to go back over the orchard 2 to 3 weeks after debudding to remove unwanted sprouts in the cleared zone and at the end of scaffold. Oriental fruit moth control is important to avoid damage by this insect to the terminal bud. The single and debud technique is most useful during the first 3 years of scaffold development to help to prevent canker problems on the most critical structural component of the mature tree.

Avoiding over-vigorous growth in tops of older trees

A young peach tree is generally very vigorous and will develop numerous fruiting limbs. However, as peach trees mature, it is common to see very little new fruiting wood develop on older limbs. This problem is the result of growing structural wood above/distal a fruiting wood zone. The large side 2ndary structural limbs will eventually inhibit the emergence of new fruiting wood on the proximal (toward the main trunk) side, shown in the picture as the zone marked with the white bar. The solution in this case is to remove or severely stub the large side branch, thereby allowing the primary structural limb to continue generating new fruiting wood in future years.

If the large side limb remains on the upper end of a scaffold, the lower part of the scaffold will lose its ability to generate new fruiting wood and will become a purely structural limb. Thus, the fruiting zone is shifting to the top of the tree. Again, the solution is to remove or stub limbs (see below) that are shutting off fruiting zones you want to retain. It is important to remove these inhibitory limbs early in the life of the tree so that large, canker-promoting cuts are not needed.

This general concept of fruit zones applies to all the various tree designs such as open center, freestanding Y, quad V, etc. Each design has its target number of primary limbs (uprights) arising from the trunk. Regardless of the design, the goal is to maintain the fruiting zones on these "uprights".

Training Y trees

After planting, head the tree at 22 to 30" from ground. Remove branches in the zone from 16" down to the ground with relative tight cuts as this is the area we don't want any branches returning.

If you have good side branches in the upper zone from 16" to 30" at the time of planting you can keep them. You need at least one good branch on either sides of the tree, perpendicular to the row. It is safer to retain 2 per side during the first growing season so that the best one can be selected later in the summer or during dormant pruning for year two. These branches should be about 25 to 40 degrees from the vertical. In a few weeks clamp a clothespin on the trunk above the growing shoot to help establish good crotch angles. These are put on at about 4" growth and removed about 3 weeks later.

If the branches at the time of plant are inadequate, cut (whip) the limbs in the upper zone (16" to 30") down to small stubs from 1/3" to 1.5" long. If the trunk caliper is large or some doubts that the tree may not send out new shoots, leave longer stubs (up to 1.5" long). It is best to develop two or three branches on either side of the trunk during the 1st year so that the best ones in can be chosen during dormant pruning in year two.

Check the trees several times during the first 2 months and remove any strong branch attached higher on the central trunk than the limbs expected to be the two scaffolds of the Y.

At spring trimming time in year two, choose two scaffold limbs attached approximately 1 ½ to 2 ft from ground, facing opposite directions out into the drive row. The chosen limbs can be directly opposite, or slightly offset. If possible, the windward (west-facing) limb should be lower than the leeward. Head the tree 1 to 2 inches above the upper limb. Remove all limbs below the two scaffolds.

Use two 7ft bamboo per tree to train the two scaffolds to the correct angle. Wait until soil is wet so that the sticks can be easily inserted. Bamboo is inserted approximately 1 foot into ground, each at about a 60 degree angle from the horizontal, crossing approximately 1 foot above the ground. Put westward bamboo slightly lower than the eastward one to compensate for bending by the prevailing wind from the west. Tie each scaffold to a bamboo with two pieces of soft tie material such as flat vinyl tape. MaxTapner are not strong enough. The bamboo can be tied to the tree trunk at the cross point for extra support if desired.

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Short stubs if planting small caliper tree

Longer stubs if planting larger caliper trees

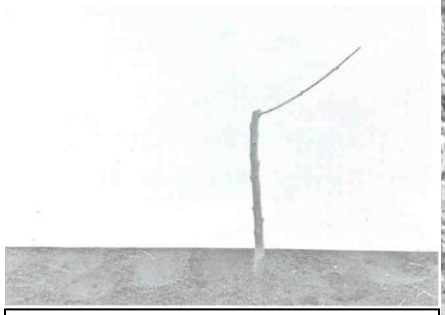
Scaffolds were selected at time of planting

Scaffolds like wings and tail of an airplane, into prevailing wind

Four scaffold tree at start of second leaf

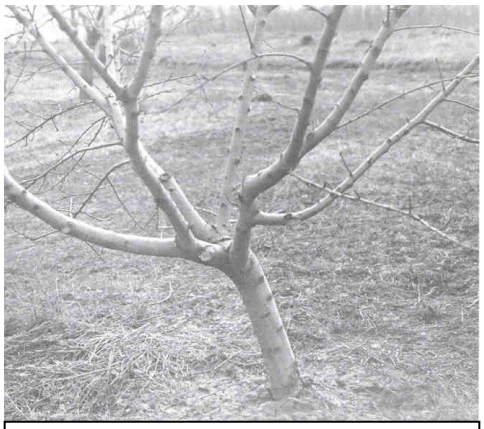
Too many scaffolds on this tree

5 year old open center peach trees



Side leader at time of planting

Side leader after 1st year



Older side leader tree

Preventing Bad Crotch Angles

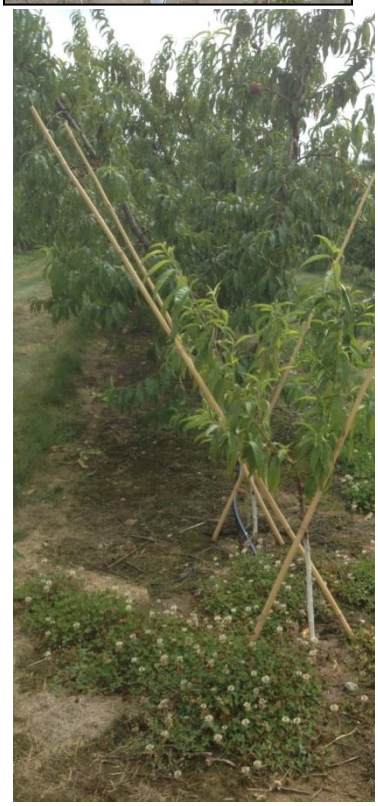
Multiple sprouts grow from last years terminal bud region.

Branch end before simplifying

Terminal end after simplifying

By removing sprouts close to terminal end the year before, this region does not have bad limb angles.

Y Training System



Palmette

Maintaining Fruiting Zones by simplifying branches

Oversized side limbs (left) eventually inhibits fruiting zone of primary limb unless removed (right)