

How to avoid mistakes when establishing and training a tall spindle orchard

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There are different ways to plan, prepare, and establish a successful high-density apple orchard. However the decisions made now and methods used this 2016 year for establishing that orchard will have consequences for the next 20 years. We stress the importance of (1) advance planning for a minimum of two years to get the proper tree with the right rootstock and to prepare the soil well the year before, (2) the use of nursery trees of excellent quality whether they are bought or produced on the farm, (3) early spring or fall planting to allow early root establishment and maximum tree growth in the first year, (4) quick installation of a trellis support and irrigation lines soon after planting, and (5) optimal leader growth of 18-24” for each of the first 2-3 years as a result of a balanced nutritional program, irrigation, excellent weed control and overall good orchard management.

Today a modern high density planting must be supported with 12 foot posts so trees are properly supported to quickly reach the top trellis wire (10 feet) by the end of the second or third year. A good, strong, and tall support system for a high density orchard must be viewed as an investment (rather than just an orchard establishment cost!) that allows fruit production in the early years while preserving the vertical tree structure (without ever allowing the top to bend if unsupported!) and developing a full canopy for future large, mature yields from the bottom to the top of the tree.

Planting the Young Apple Tree Carefully. The roots of a young tall spindle apple tree contain much stored nitrogen, hormones, and other elements, which are used in forming both new root growth and new top growth. Any broken or injured roots should be trimmed off, but the root system should not be reduced more than necessary prior to planting. Once your soil has dried out sufficiently and you are able to plant, keep your trees out of the sun and protected from drying winds (never allow the roots of the tree to dry out). If possible, soak roots for a couple of hours before planting using a pond, tub or barrel. Growers should plant trees with at least 4-6 inches of rootstock out the ground. The soil should be packed firmly around the roots in order to establish good contact. At about two weeks after planting the trees should receive a small dose of nitrogen (1/4 lb. of calcium nitrate) carefully applied in a doughnut shaped band around each tree.

Pruning and Managing the Tall Spindle Apple Tree after Planting. If you plant a Tall Spindle apple block you should not head the leader. Heading of the leader of a young apple tree after planting is undesirable as it removes a significant portion of the tree structure already produced in the nursery. Even if a whip is planted, the leader is not pruned or headed at planting for the Tall Spindle system. Heading the leader disrupts and changes forever the natural growth and branching patterns of a young apple tree on a dwarfing rootstock intended to be grown as a Tall Spindle tree. Instead of heading a whip, we recommend applying Maxcel (500ppm) to stimulate branching of an “unheaded” whip so a more “calm tree” without much new upright growth as result of the heading cut. The Maxcel should be applied at a rate of 6.4 ounces/gallon

with a backpack sprayer using a single nozzle to the leader from the tip down to 24 inches above the soil at 10-15 days after bud break. To improve branching even more you may combine the Maxcel treatment at 10-15 days after bud break with scoring (at bud swell) above every other bud along the leader from 24 to 45 inches high.

If you plant a Tall Spindle apple block with feathered trees you should remove any feathers larger than $\frac{2}{3}$ diameter of the leader with a bevel cut, if there are less than three feathers remove them with a bevel cut and treat the tree as a whip as described above.

Branch Management of Moderate and Highly Vigorous Apple Trees. It is essential with Tall Spindle orchards planted at 3 feet inrow spacing to tie down the feathers below horizontal soon after planting (before mid June). Growers should invest the necessary time and effort to manage feathers of a young Tall Spindle orchard if the trees are growing vigorously. For example, all feathers on Fuji or Macoun (two vigorous apple cultivars) should be tied or weighted down below the horizontal at planting or before mid July to induce cropping and to prevent them from developing into large lower scaffolds. Tying is best done within one month after planting but can also be done in June, July, and even until August. The following materials are particularly suitable for tying down feathers below horizontal for the Tall Spindle system: (1) a strip of 5/8"-wide Avis-strap nailed or tied from the base of the trunk then split into strands and tied to each of the lower feathers, (2) a pre-cut 20-inch black annealed wire (sold as a 1000 pieces/bundle) each hooked around the feather directly down to the trellis wires, the conduit pipe or bamboo supporting pole, or the main trunk, and (3) a 4-inch long ghent rubber band (six-month-life with 880 rubber bands per bag) where the rubber band is tied on the trunk and the feather is placed through the band when it is stretched out. After about 4-6 months the rubber band stretches and is less effective for strong feathers while Avis-strap strings and the pre-cut black annealed wire are suitable for bending both weak and vigorous feathers.

Ensuring Great Tree Growth the First Year. After the trees are planted, the graft union height adjusted, the trees are pruned and feathers are tied down, growers should focus on the basics of good tree management the first year: 1) Excellent weed control through the end of August, (2) regular small doses of nitrogen ($\frac{1}{4}$ lb of CaNO_3 every month for the first 4 months), (3) good water supply to minimize water stress of the young tree. Using trickle irrigation apply small amounts of irrigation water (3-5 gallons per week) each week of the growing season unless sufficient rain falls that week. Growers can now precisely determine how much water to apply to newly planted apple orchards using the Cornell apple irrigation website on the NEWA webpage.