

MECHANIZED TREE PLANTING INFORMATION

Durango District, Colorado State Forest Service

The Durango District of the Colorado State Forest Service (CSFS) has two tree planting machines and a weed barrier fabric laying machine available for use by private landowners on a first come, first served basis. The tractor and operator needed to use these implements are supplied by the landowner. A 40-horsepower or more 2-wheel-drive tractor or 30-horsepower or more 4-wheel-drive tractor is recommended. The tree planting machines can either be picked up and used by the landowner for a fee of \$40/day (minimum rate), or arrangements can be made with CSFS to do the planting for a fee of \$40/day plus \$30/manhour. The weed barrier machine is brought directly to the site by CSFS personnel, who then assist the landowner in laying the fabric. The fee for this service is \$100/day plus \$10/roll of fabric if laying less than 10 rolls, or \$5/roll if laying 10 or more rolls. The tree planters and weed barrier machine are intended for row plantings, such as farmstead windbreaks, field windbreaks, hedgerows, etc. These implements do not work well, or at all, on rocky areas, where there has been no site preparation, or where terrain prohibits the use of mechanized equipment.

Site Preparation

In most situations, the soil must be worked up before using either the tree planter or weed barrier machine. In addition to helping to facilitate mechanical planting and fabric installation, site preparation eliminates competing vegetation (at least temporarily) and allows for better air exchange, moisture penetration, and root growth in the soil

Ideally, it is best to plow the soil the fall before planting and leave it rough over the winter, then disk it in the spring prior to planting. If this is not possible, then both plowing and disking will have to be done before spring planting. A rototiller can be used for smaller plantings. Plow as deep as possible. Seedling roots will be 7 inches long if you are using CSFS potted stock, and usually longer if bare root.

The rear plows on the weed barrier machine, used for anchoring the sides of the fabric with dirt, are set wider than the fabric. Because of this, the ground should be worked up at least an additional two feet wider on each side of the fabric than the width of the fabric (i.e., if using 6 ft. wide fabric, work up a 10 ft. swath of ground for each row of your planting; the seedlings should be planted in the middle of this swath). Many people elect to work up the soil for the entire width of a multiple row planting. If this is done, work up at least two feet more on the inside of the inside row and two feet more on the outside of the outside row from where the edge of the fabric will extend to. For various reasons, the rows of conservation plantings are usually spaced from 12 to 20 feet apart. If rows are spaced too closely together, the weed barrier machine will plow up the edge of the fabric laid on the preceding row.

Preparing Bare Root Planting Stock for Machine Planting

The roots of bare root stock may need to be pruned to a reasonable length with a sharp pair of scissors prior to planting. Do not get too carried away! Avoid removing more than a third of the

average length of the roots; no more than a quarter of the length if possible. It is important to keep the roots of bare root planting stock from drying out. Prepare a slurry of either dirt mixed with water or hydrated artificial polymer (powdered variety best) in a bucket (5-gallon plastic pail works well). Remove the desired number of seedlings from the shipping bundle and immediately place them in the bucket of slurry. Quickly rewrap any remaining trees in the bundle or heel them into the ground. Water the leftover trees in the bundle to keep roots moist, and place in a shaded location. Place the bucket of bare root seedlings in the space provided on the tree planter where they can be easily reached. Take a seedling from the bucket just before you are ready to plant it. Any bare root trees left in the bucket at the end of the day should not be stored in the slurry overnight, but either returned to the bundle or heeled into the ground.

Preparing Potted Planting Stock for Machine Planting

If using potted trees, water the trees in the box if they are dry, then grabbing the base of the stem, carefully pull each tree from its cell or tube and place in a bucket or tray. If using potted trees wrapped in tarpaper, pull out the staples and carefully unwrap the tarpaper. Try not to disturb the soil around the roots any more than necessary. Put the container of seedlings in the space provided on the planter where it can be easily reached while planting. Note: if trees remove easily from the styrofoam box, it may be possible to take them directly from the box as they are planted. At the end of the day, return any leftover trees to a cell or tube in a box and water to moisten the roots.

Machine Planting Technique

Although it is called a tree planting machine, it is a person riding on the machine that actually does the planting. He or she holds the next seedling to be planted in the furrow created by the implement's plow as it is slowly drawn along by the tractor. Grasping the seedling at the base of the stem, it is lowered into the ground, guided back toward (but not to) the packing wheels, and released. It is important to keep the root collar of bare root seedlings (the point separating root from stem), or the top of the soil pot of potted trees, at ground level. Because the planter is plowing up the soil, it can be difficult to determine just where ground level is - just give it your best shot! It will probably take some practice to get into the planting routine. Someone should check the seedlings in each row after it is planted to make sure they are tightly in the ground and are not planted too deep or too shallow.

For spacing of seedlings within a row, a chain with a marker set at the desired distance can be dragged on the ground behind the planter. Measure the spacing distance from a little behind the plow. When the marker is about to reach the last tree planted, a person walking behind the tree planter says "ready . . . plant" to the person riding on the machine. Again, it may take a little practice to get the rhythm down. Another option is for the planter to use a count or cadence to achieve the desired spacing. To do this accurately, the speed of the tractor must remain constant. As you might imagine, it can take some trial and error to master this method. Recommended spacing between plants in a row are: shrubs 3-6 feet apart, junipers 6-12 feet apart, small deciduous trees 8-12 feet apart, tall conifers 8-14 feet apart, and tall deciduous trees 8-18 feet apart.

“Green” Tree Planter

The planter is transported down the highway by towing behind a vehicle. It requires a 2” trailer ball.

Raise plow (see below) and remove plow support bar before using. Remember to replace plow support bar and lower plow onto bar before again towing behind a vehicle.

Remove chain supporting tractor attachment tongue and lower tongue. Again, remember to raise tongue and secure with chain before towing with vehicle.

Grease all grease fittings each day before using the planter (grease gun is in tool kit that comes with planter). Fittings are located on the rubber-tired wheels, packing wheels, and moving shafts.

This planter attaches to the draw bar on a tractor with a pin (an assortment of pins are in tool box). The tongue that attaches to the tractor is at the opposite end of the planter than that for highway towing.

To drop the plow, the person riding on the planter flips the small silver lever on the hydraulic pump. To raise the plow, this lever is flipped in the opposite direction and the large lever is pumped back and forth. If the plow does not raise properly, hydraulic fluid may need to be added to the pump.

“Orange” Tree Planter

This planter is transported down the highway on a modified snowmobile trailer requiring a 2” trailer ball.

Remove trailering supports from the planter. While steadying the planter, attach it to the 3-point hitch on the tractor and lift planter off trailer. When finished, place planter back on trailer and secure before towing.

Before using the planter, grease the grease fittings on the coulter wheel in front and on both rubber-tired wheels (grease gun is in tool kit that comes with planter).

Planter is raised, lowered, and plowing depth adjusted with the 3-point hitch on the tractor.

Weed Barrier Fabric Laying Machine

Since this implement is a little more complicated, CSFS personnel accompany it to the site and assist in laying the fabric. The fabric (woven black polypropylene geotextile fabric) is supplied by the landowner. The following Soil Conservation Districts sell quality fabric of the type required: Dolores SCD in Cortez (565-9045, ext. 3), Dove Creek SCD in Dove Creek (970-677-2248, ext. 3), and La Plata SCD in Durango (970-259-3289, ext. 3). Fabric is sold in 100-yard (300-foot) rolls. The 6-foot wide fabric is generally recommended, although 4-foot wide is

acceptable for shrubs. When determining how much fabric you need, measure the length of the rows to be planted and add 6 feet to every 100 yards, and 3 feet for every time the fabric will be cut (i.e., at the end of a row).

Please be careful when working with tractors and implements. Watch your hands and feet, and be especially alert when near PTOs and hydraulically-controlled moving parts. **Safety is no accident!**

For further information, please contact Kent Grant at the Colorado State Forest Service office in Durango at 970-247-5250 (fax: 970-247-5252; e-mail: kgrant@lamar.colostate.edu). Good luck with your conservation planting!