

Plant Trees and Help Them Thrive!



Seedling Survival Supplies Catalog

Since 1986, the CSFS Grand Junction District has provided a single source for tips and materials to help your seedling trees survive. We buy the various Seedling Survival Supplies in quantity for our planting projects, and pass on the savings. If you order seedlings from the CSFS nursery, and order the survival supplies from us, we will have your supplies available for pickup with your seedlings in the spring.

We continue to emphasize *weed barrier fabric* as a major innovation for weed control and moisture conservation. Initial cost is high, but the *labor savings* (weed control & irrigation) is so significant that almost all large windbreaks in the western U.S. now use weed barrier fabric.

Tree planting plows & weed barrier fabric machine:

We have had these labor saving machines for years, and similar ones are used extensively for the large windbreaks planted on Colorado's eastern plains. The CSFS Grand Junction District has a tree planting plow and a weed barrier fabric laying implement that greatly facilitate planting trees on larger jobs. These implements are available to assist landowners with larger plantings (500 or more trees or shrubs). Tree planting plows can plant 300 to 500 seedlings per hour.

Tree Planting Plow Pros:

- Speed of planting 300-500/hour.
- Depth of planting easy to control.
- Roots properly compacted, no air pockets.
- Easy to do a quality job.
- Nice furrow left for irrigating down row.

Tree Planting Plow Cons:

- Too much hassle for less than 500 trees.
- Not good for over 5% side slope.
- Have to provide your own tractor.
- Need a crew of at least 3 people.
- Pick up & return of equipment.

Fabric Machine: If you are doing a large windbreak or wildlife planting project with weed barrier fabric, you will want to use this! It lays fabric over your planted row and plows dirt onto the edges to hold it down. One person riding the machine marks the fabric as it is applied, while another person following behind makes a slit and pulls the seedling through. Please call us well in advance to schedule the use of either the planting plow or fabric laying implement.



How To Contact Us:

Colorado State Forest Service
Grand Junction District
2764 Compass Dr., Unit 101
Grand Junction, CO 81506
970-248-7325

<http://csfs.colostate.edu/districts/grandjunction-district/grandjunction-seedling-trees/>

Supplemental Irrigation

Water is the primary ingredient in the successful establishment of seedling trees in Colorado. A drip irrigation system can be a highly effective way to water your newly planted seedlings. Note that our drip systems are designed to enhance seedling tree *establishment*, but are not a permanent solution to watering mature trees. Where large, mature trees are planned in our dry environment, an adequate water delivery system will eventually need to be designed and installed to replace the drip irrigation.

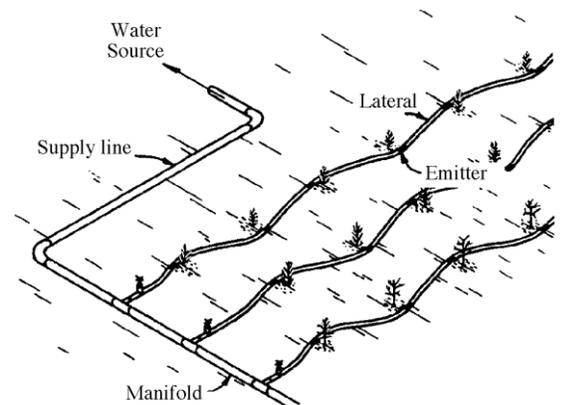
Drip irrigation slowly applies water directly to the root zone of new seedlings. Water loss due to surface evaporation and competing vegetation is minimized, thus reducing water use, decreasing seedling moisture stress, and reducing weed growth. Drip irrigation systems may seem expensive initially; the savings comes from ease of application, low maintenance, efficient water use, and fewer tree replacements.

We have designed two drip irrigation system packages: one package is for a 30 tree planting and the other for a 100 tree planting. Both systems are designed to connect to a standard garden hose and include all tubing, tube fittings, filters, emitters, “goof” plugs, hose attachments, end plugs, and instructions. Additional drip components can be ordered to modify or expand these systems. For larger planting areas, please contact our office for design assistance and bulk discounts.

These drip systems use emitters that are both *pressure compensating* and *self-flushing*. **Pressure compensation** is important because you avoid complex pipe sizing designs in order to adjust for friction or elevation pressure gains and losses; all that is needed is a water pressure between 15-50 PSI. **Self-flushing** allows the emitter to clean itself, an important feature when using ditch water. These systems were designed primarily for row or block planting using ten foot spacing, but they can also be used for random planting and varied spacing.

For tree planting on extremely dry sites with available water, the ideal planting has both weed barrier fabric and drip irrigation. If you are considering a drip system, please call us for more information on this efficient irrigation system.

Because of the expense, we often recommend drip irrigation for those areas where water *quantity* is limited (i.e. those with only well water or domestic, treated water). However, the ease and efficiency of drip irrigation allows use with irrigation water, and even electric timers.



Water-Holding Polymers

Okay, drip irrigation is a great idea... But, what if you don't have the water supply for this type of system? Consider using synthetic polymer, an aid in the successful establishment of new seedlings on non-irrigated sites. This water-holding polymer is a granular material that, when added to water, absorbs up to 200 times its weight in water. The polymer re-hydrates with each watering or significant rainfall and holds moisture in the root zone until it can be used by seedlings.

Please do not confuse this polymer with the more widely sold starch-based absorbent that quickly breaks down in the soil. We offer the polymer in two granule sizes. The “smooth” polymer is used as a *slurry root dip*, and has a honey-like consistency when hydrated. When bare root seedlings are dipped in the slurry, it clings to the roots and prevents root drying. The “chunky” polymer is jello-like in consistency when hydrated, and is used as a *soil additive* in the backfill of the planting hole. Polymer stores water for long periods of time, enabling seedlings to survive periods of temporary moisture stress. This is important on those planting sites where supplemental watering may be limited. Polymer is best suited to sandy soils that are well drained. Soils with a lot of clay do not benefit from polymers.

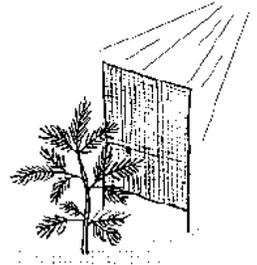
When used in conjunction with drip or other irrigation systems, the polymer allows longer intervals between watering and reduces moisture stress. These polymers (smooth slurry dip and chunky soil additive) are available in half pound packages. Smooth polymer will treat 200 bare root trees and chunky polymer will treat 100 planting holes. Instructions for mixing and use are included.

Scorch Protection

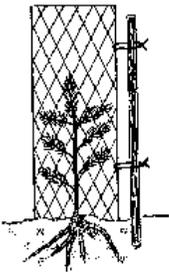
Colorado's high elevation magnifies solar intensity and increases the ultra-violet radiation reaching trees, which may limit growth. Many evergreens are highly sensitive to open sunlight and need protection.

In a natural forest, new seedlings are protected from high-intensity sunlight by adjacent objects, such as mature trees and downed logs. In artificial planting, this protection usually does not exist. This factor is of greatest concern with evergreens, especially spruce, fir, and Douglas-fir. On open sites without existing shade, we recommend the use of wood shingles, boards, or tree shades.

Tree shades are 8" x 12" plastic mesh screens slipped over and stapled to wire wickets, and then positioned on the south and/or southwest side of the seedlings to provide an 80 percent shade factor. Tree shades protect seedlings for up to five years during the critical establishment period. Tree shades are available in packages of 25 or 30, including wire wickets. These shades work better than wood shingles on rocky ground because the wire wickets are more easily inserted into the ground.



Animal Control



Tree damage from deer, elk, and rodents can be a serious problem in western Colorado. Tree guards help minimize this problem. The tree guards we use are 24 inch tall, 4 inch diameter, plastic mesh tubes that are slipped over the tree and staked to the ground with a bamboo stake. The plastic tubes photo-degrade in approximately 3 years after the trees are established and have outgrown them. The plastic is flexible enough to withstand temperatures from -30 to 110 F, but tough enough to prevent animals from chewing through them.

Physical exclusion methods such as plastic mesh tree guards, home made wire mesh cages, and 8 foot deer fence can be effective, but they have their disadvantages: Plastic mesh deer guards are frequently pulled off (particularly by elk); wire mesh cages eventually have to be cut off as branches grow through or they will girdle the tree; and trampling may still be a problem. Tall game fence is very expensive (\$25/running foot), unsightly, and creates problems with access.

Repellents can be used as a possible solution. Repellents work either by taste or smell, or both. Ropel® is a good example of a taste repellent, as it is extremely bitter and has the advantage of soaking into the plant it is applied to. Capsicum, the active ingredient in hot peppers, is another taste repellent. These can often be purchased locally at nurseries. Taste repellents are usually most effective on resident populations (good for rodents). If you are in a migration route and every critter has to take a bite to discover your trees are bitter or hot, pretty soon there will be nothing left!

Smell Repellents are available commercially, or you can make them yourself. Chicken eggs have been shown to be very effective: A 20% solution mixed with water sprayed or brushed on the trees acts as an effective deterrent to animal browsing. Deodorant soap is reportedly effective as well (small pieces of soap can be hung from tree limbs with fishing line, much like Christmas ornaments). Moth balls (active ingredient = paradichlorobenzine) can also be effective, though short lived.

Electric fence is typically 6 feet tall, with single or multi-strand charged wire, which is sometimes “baited” with strips of roofing tin or aluminum that has peanut butter or apple pulp smeared on it. In the case of the baited electric fence, the deer/elk go for the scent of the bait before your trees and get a “shockingly” bad feeding experience in the area of your trees.

Most often, a serious deer or elk problem will require a combination of treatments for success. Taste and smell repellents may have to be renewed frequently. What works best for you may require some experimentation. Please let us know what works or what doesn't work, so we can pass the information on to other landowners.

Weed Barrier Fabrics

An alternative method of weed control, as well as a method of conserving soil moisture, is the use of **weed barrier fabric**. This woven polypropylene fabric is placed over planted seedlings. “X” shaped slits are then cut into the fabric, and the seedlings are pulled through. The fabric we sell is resistant to breakdown caused by ultra violet radiation and is **guaranteed for five years** by the manufacturer, uncovered. However, the fabric also traps heat and should therefore be secured close to the ground to prevent heat buildup, as well as to prevent the fabric from blowing away. The easiest way to accomplish this is to bury the fabric edges just a few inches deep in the soil, and to secure the fabric with 6” staples in-between seedlings. Weed barrier fabric applicators (available for rent) install rolls of fabric over the planting (700 to 900 feet per hour) and plow soil over the edges to keep the fabric low to the ground, all in one operation.

In addition to serving as a weed barrier, the fabric is very **effective at holding soil moisture**. Tests have shown that the moisture level of soil under fabric was two to nine times higher in August than soil without fabric. This woven fabric allows natural rain and snow to penetrate, traps existing soil moisture, and slows evaporation. While plastic film can do the same thing, it has three very important drawbacks: it must be covered with gravel or chips so the sun does not break it down, natural precipitation can't penetrate the plastic, and oxygen necessary for good root growth cannot enter the soil. **Using weed barrier fabric eliminates most weeding, as well as reducing the amount of irrigation necessary.**

Weed barrier fabric is available in 4'x4' patches or 300 foot rolls (four or six foot widths). Weed barrier fabric works by preventing germinating weed seed shoots from penetrating from below. Weed seeds can germinate *on top* of the fabric (a common problem when fabric is covered with excessive soil) and send roots through it as they do on a very rocky site. Therefore, we recommend keeping soil off the fabric except at the edges.

There is a much cheaper and widely sold weed barrier fabric made from spun-bond polyolefin (like *Tyvek*), which has random fibers rather than woven fibers and is **not** ultra-violet (UV) resistant. Polyolefin fabric deteriorates rapidly when exposed to sunlight and rots quickly in the soil. Avoid the use of white or light-colored fabrics, which create a greenhouse under which weeds tend to flourish. **We recommend that you use only black, woven, polypropylene fabric.**

The best endorsement for this fabric is the fact that we sell most of it to people who have purchased it from us previously!



Weed barrier installed with tree guards