

Plant Trees and Help Them Thrive!

Seedling Survival Supplies

Our Tree Care Program provides you with tips and materials to help your seedling trees survive. We buy various seedling survival materials in quantity and pass along the savings.

In past years we have emphasized how *weed barrier fabric* is 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 windbreaks in the western U.S. now use weed barrier fabric. Weed barrier fabric, installed in the spring, traps residual winter soil moisture. In higher altitude areas, with at least fifteen inches of annual precipitation, supplemental watering through the growing season may not be necessary. While watering is recommended in dry areas or during a dry season, evaporation from soil covered with this fabric mulch will be far less. Weeds are also minimized. Weed barrier fabric is available in continuous rolls or pre-cut 4x4 and 6x6 squares for those planting sites not suited to continuous rolls.

Because quantities are limited, please call the district in advance to arrange to pick up supplies. **We do not ship any products.** Check with your [local tree distributor](#) regarding deadlines for tree orders.

Tree planting plows & weed barrier fabric machine:

These labor saving implements, and similar ones, are used extensively for large windbreaks planted on Colorado's eastern plains. Because wind is not a significant problem in western Colorado, fewer windbreaks are planted and the district's equipment is generally available.

<p>Tree Planting Plow Pros: Speed of planting 300 to 500 per 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</p>	<p>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</p>
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Planting trees is hard work. Planting to the proper depth and compaction can be difficult, especially with several hundred trees. With the aid of tree planting plows, several people can plant 300 to 500 trees per hour. Even if your site preparation is not optimal, or all of your crew doesn't show up to help, or your tractor is giving you problems, you'll still probably average over 300 per hour for the day!



Fabric machine: If you are doing a large windbreak or wildlife planting project with weed barrier fabric, you will want to use this. The machine lays fabric over your planted row and plows dirt onto the edges to hold it down. One person riding the implement marks the fabric as it is applied, while another person following behind makes a slit and pulls the seedling through.

How To Contact Us in [Montrose](#) or [other locations](#) around the state.

Supplemental Irrigation

Water is the primary ingredient in the successful establishment of seedling trees in Colorado. With adequate water, seedling tree survival can reach 95 percent or better. In recent years “drip” or “trickle” irrigation systems have proven very successful in the establishment of new seedlings.

Drip irrigation slowly applies water directly to the newly planted seedling. The tree receives the water right at its root zone where it can be easily taken up for use. 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, and efficient water use resulting in reduced maintenance costs 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. For larger planting areas, please contact our office for design assistance and bulk discounts.

These drip systems use a different emitter from most in that they 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 of 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 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. Additional drip components can be ordered to modify or expand these systems. Please read our [drip irrigation instructions](#) or call for more details on drip systems.

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 allow use with irrigation water, and even electric timers.

Water Holding Polymers

OK, drip irrigation is a great idea... But, what if a water source is unavailable to supply this type of system? Consider using a synthetic polymer, an aid in the successful establishment of new seedlings on non irrigated sites. This water holding polymer is a granular powder that, when added to water, absorbs up to 200 times its weight. The polymer re-hydrates with each watering or significant rainfall and holds moisture in place until it can be used by seedlings.

Please do not confuse this polymer with other types that absorb much less than 200 times their weight, or 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*; when mixed, it has a honey-like consistency. When bare root seedlings are dipped in the slurry, it clings to the roots and prevents root drying that can cause tree mortality while reducing transplanting shock. The “chunky” polymer is jello-like in consistency when mixed, and is used as a *soil additive* in the backfill of the planting hole. The polymer stores water and conditions the soil, making more efficient use of natural rainfall and enabling seedlings to survive periods of temporary moisture stress. This is important to those planting sites which will receive no supplemental watering.

When used in conjunction with drip or other irrigation systems, the polymer allows longer intervals between watering and reduces moisture stress if irrigation is not performed on schedule.

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 with the product.

Scorch Protection

Colorado's high altitude 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. Therefore, we recommend the use of shingles, wood blocks, hay bales, 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 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 30 or 50, including wire wicket. These shades work better than shingles on rocky ground.

Weed Control: Chemical Herbicides

Competition from weeds can result in seedling mortality by reducing the water and nutrients available to seedlings. Herbicides and mechanical cultivation are viable weed control methods; however each must be repeated several times during the growing season to be effective.

Use care to avoid herbicide contact with desirable plants. A home-made shield can be constructed using a two or three foot long piece of six inch plastic (PVC) pipe; a handle may be incorporated into this shield by drilling two ¼-inch holes across from each other, near one end of the pipe and stringing a short loop of parachute cord. Place the shield over each individual seedling while applying herbicide to weeds near the seedling.

Chemical approaches to weed management include post-emergent herbicides (applied to the weed or undesirable plant after it has emerged from the soil and is actively growing) and pre-emergent herbicides (applied to the soil before seeds have germinated to inhibit the germination process or interfere with early root growth).

For more information on these chemical approaches, following link will take you to the Home Use Pesticide Database (including herbicides). The information contained therein is not a recommendation, but merely a listing of pesticides which may be registered for a particular use. The listing is in no way complete. There will be other pesticides registered for any use, and pesticide registrations vary by state. It is the users responsibility to read and follow all label directions when using any pesticide.

[The Home Use Pesticide Database](#)

Chemicals are a tool to control weeds just like a hoe, weed eater or a roto-tiller. You must know the weeds you are trying to control to be most efficient and cost-effective with any herbicide. Remember to **read and explicitly follow label directions**.

Weed Control: 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 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 (uncovered)! However, the fabric also traps heat, and should therefore be secured close to the ground to allow heat to escape, as well as prevent it from blowing away. The easiest way to accomplish this is to bury the fabric edges just a few inches deep in the soil. 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 retards 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 and irrigation, and provides a truly maintenance free planting.

Weed Barrier Fabric is available in squares or 300 foot rolls (four or six foot widths). The pre-cut squares are quite popular due to the convenience of placing over individual trees planted in random spaces. We strongly suggest that the six foot wide fabric be used when planting on dry sites, if drip irrigation is not used. The wider width increases the weed free zone around your trees and conserves greater soil moisture.

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 along 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 fabric;

lighter colors create a greenhouse under which weeds can flourish! We recommend that you use only black, woven, polypropylene fabric.

Animal Control

Tree damage from deer, elk, and rodents is a serious problem in western Colorado. Tree guards help reduce this problem. Tree guards are 18-inch tall, 4-inch diameter, plastic mesh tubes that are slipped over the tree and staked to the ground. 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. Taste repellents are usually most effective on resident populations and are effective for rodents. If you are in a migration route and every animal takes a bite to discover your trees are bitter or hot, soon there will be nothing left!

Smell Repellents are available commercially or you make these yourself. Chicken eggs have been shown to be very effective – a 20 percent solution mixed with water sprayed or brushed on the trees will work. Coyote urine, human hair - hung on the trees in old nylon stockings, deodorant soap (drill a hole through the bar and tie it on the trees with cord), and chicken feathers ground up and mixed with water and sprayed on the trees all show good test results. Moth balls (active ingredient = paradichlorobenzine) can be effective, though short lived. If you use deodorant soap, get the strongest smelling kind you can find. The small “motel size” work well and will last longer if you leave the wrapping on.

Landowners have reported success with a few other innovative ideas: human urine and high test (100 lb. +) monofilament fishing line strung up through the tree plantation. The idea with the fishing line is similar to baited electric fences – to give a “bad feeding experience” in your plantation. Deer will find it difficult to see the fishing line, especially in the dark, and will run into it and get spooked. You’ll have to re-string it a few times, but then they will find easier places to eat elsewhere. Warning: fishing line could be a significant hazard in areas of high human activity (like snowmobiling).

Electric fence configurations include 6-8 foot tall, multi-strand or a single “baited” strand of charged wire hung with strips of roofing tin or aluminum with peanut butter or apple pulp smeared on it. The deer/elk are attracted to the scent of the bait before they are attracted to your trees and get a bad feeding experience near your trees.

Most often, a serious deer or elk problem will require a *combination* of treatments for success. What works best for you may require some experimentation – let us know!

Low Maintenance for Harsh Sites

By combining various products, it is possible to get acceptable survival rates on even very harsh sites such as previously burned areas and/or south-facing slopes. A large potted conifer planted with polymer soil additive, weed barrier fabric, tree shade, and guard is a good option for sites that will receive little or no care after planting.

Harsh planting sites such as dry southern slopes, wildland fire burned areas, and other dry, exposed sites present a challenge for seedling tree establishment and survival. Usually the limiting factor for tree survival in western Colorado is water. Fortunately, in the last few years there have been some developments that make it a little easier to keep moist soil around seedling roots.

Soil: Organic matter holds moisture but don't overdo sawdust, peat moss, or manure. Sawdust robs nitrogen fixing bacteria away from your seedling as part of its decomposition process that can also spread rot to seedling roots. Better to mix a little nitrogen with the sawdust and use only a little (<10%) as a soil amendment. Sawdust is better used as mulch on the soil surface to reduce soil temperature and reduce weed growth and moisture loss from the soil. Peat moss is acceptable and will help acidify an alkaline soil – just don't overdo it. About 10-20 percent of your soil mix can contain peat moss. Wood ashes are very alkaline and should never be used as a soil amendment in western Colorado.

Manure should never be added to the soil in your planting hole, even if well aged. Manure is just too “hot” and will likely burn new hair roots or spread rot to them. You can spread old, highly organic matter manure (such as horse manure) on the surface around the seedling as mulch – what little nitrogen present will leach into the soil gradually.

Moisture Retention: Polymers can be used (see previous paragraphs).

Mulch: Sawdust and manure were mentioned as surface mulches above. The purpose of mulching is to keep down competing vegetation around your seedling, reduce moisture evaporation from the soil, and lower soil temperature. Plastic film is effective for the first two and, because the soil moisture is higher under the plastic, it is also cooler. A 2 ft. x 2 ft. square around a seedling is a minimum – *more is better*. You will need to put something on top of the plastic to hold it down and keep the sun's UV

rays from breaking it down: gravel is best and big wood chips will work but soil is not a good choice because weeds will take root in it and the roots will eventually get through the plastic.

A better mulch, though more expensive, is weed barrier fabric (see previous paragraphs on weed barrier fabric).

We have now planted our container grown seedling, adding polymer in the planting hole and using weed barrier fabric held down by gravel. What else can we do to enhance moisture on this micro-site?

Forming a catchment basin or a large funnel around the seedling will help a great deal. Sloping the soil towards your seedling or, if it is on a slope, piling up the soil around the downhill side of the seedling will catch or slow down natural moisture enough to allow it to soak down to your seedling's roots.

All other factors being equal, potted seedlings are tougher and grow faster than bare root seedlings. A seedling grown in a small pot and planted with the soil undisturbed will allow a greater number of the important hair roots to survive transplanting. The larger the pot, the better for seedlings. Bare root seedlings may survive when planted with polymer or on irrigated sites but, for harsh planting sites, you will generally be better off with potted stock. The increased cost for potted stock is usually worth the extra labor and cost a replanting would entail.

Few things can be more discouraging than nurturing your seedlings through a hot summer only to have them eaten by deer in the fall or winter. Well established, 3-year old trees and shrubs can take some intermittent nibbling by wildlife, though their form will be ruined. Less well established seedlings cannot survive. (See animal control in previous paragraphs.)