



## CARE AND MAINTENANCE OF CONSERVATION TREE SEEDLINGS



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Tree planting projects on the Great Plains need regular care and maintenance to grow and thrive.

All of the work that went into preparing the site for planting and then planting the trees was only the beginning. To insure that the seedlings you planted provide benefits you want, you will need to provide regular maintenance to insure the growth and survival of your seedlings. Some of the maintenance activities you will need to consider include weed control, supplemental watering, and protection from animal damage.

**Weed control** may be the most important post-planting maintenance activity that you can perform to ensure the success of your new tree planting project. Controlling volunteer woody vegetation, annual and perennial grasses, and broadleaf weeds may be necessary throughout the life of your plantation. However, it will be most important during the first three to five years after the seedlings are planted. Eliminating competing weed species can greatly improve the survival and growth of your seedlings. They will compete with your tree seedlings for soil moisture, nutrients, sunlight and space, and provide cover for rodents that can damage young trees.

There are several methods that you can use to control weed species within and between the tree planting rows. These include mechanical cultivation (hoeing, roto-tilling, etc.), mowing or shredding, mulching (organic or fabric mulches), and chemical control (pre- and post-emergence herbicides). If herbicides are used, their selection will depend on site conditions, tree species in your plantation and the weeds to be controlled.

Mechanical or hand cultivation can be a very effective way to control weeds and grasses around seedlings. When cultivating you should clean an area at least three feet in diameter around each seedling. To avoid damage to the seedlings stay at least six inches away from the stem and do not cultivate the soil deeper than three inches. You may need to clean cultivate around the seedlings two to four times each year depending on the growing season.

Mowing is a poor alternative for weed control. Although, sometime it is the only option on certain highly erosive sites. Mowing will reduce fuel buildup, rodent cover, and make the plantation more accessible for other management activities. However, it does little to reduce competition for moisture and nutrients caused by weeds and grasses and may encourage the growth of damaging perennial grasses like brome grass. Also, there is always the potential for mechanical damage to the seedling. If you do plan to use mowing as a part of your maintenance plan, you should mow as often as necessary to keep the seedlings clearly visible.

Mulch can be used around seedlings to control weeds and reduce the loss of soil moisture. There are two common types of mulch: organic mulches and plastic fabric mulches. Organic mulches include composted yard waste or wood chips. When using organic material a top dressing of nitrogen fertilizer may be necessary to replace nitrogen lost from the soil as the organic materials decompose.

There are several brands of Aweed barrier® fabric mulches available.

Fabric mulches made of a woven, black polypropylene material are recommended for conservation tree planting projects, because woven fabric mulches are permeable to air and water. Fabric mulches suppress grass and weed growth within the tree planting row and conserve moisture in the soil. The key to making mulches work effectively is to eliminate weeds and grasses before laying the mulch. Fabric mulch is usually sold in rolls or pre-cut squares. Plastic fabric mulch can be purchased through the Lower Elkhorn NRD which also provides an installation service.



Herbicides<sup>1</sup> do a good job of controlling weeds and grasses when applied in the proper amount at the right time. Herbicides can be grouped into one of two broad categories. Pre-emergence herbicides that control woody vegetation, annual and perennial grasses, and broadleaf weed species before their seeds germinate and post-emergence herbicides which are used to control established or emerged weed species. Pre-emergence herbicides control weeds by interfering with seed germination and seedling establishment. These herbicides must be applied before weeds emerge.

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<sup>1</sup> The use of trade names in this publication is for the convenience of the reader and does not imply any endorsement, or criticism of similar products not mentioned, by the Nebraska Forest Service or Lower Elkhorn Natural Resources District.

Pre-emergence herbicides will generally require at least one inch of rainfall to activate them, leaving a very small window of opportunity for control before the weed seeds germinate. Most pre-emergence herbicides, like Pendulum 3.3 EC, Princep DF, or Surflan A. S. are applied to the soil surface after the trees are planted. Weed residues, prunings, and trash should be thoroughly mixed into the soil or removed prior to any application of a pre-emergence herbicide. There are some pre-emergence herbicides, like Treflan EC, that need to be incorporated into the soil before the trees are planted.

Herbicide application rates, the amount of active ingredient applied per acre, will vary according to the weed species that need to be controlled, the soil texture, organic matter content of the soil, and soil pH. Higher herbicide rates are often needed on fine textured soils (like clay soils), or soils that have a high organic matter content. Lower herbicide rates should be used on coarse textured soils (like sandy soils), or alkaline soils (soils that have a high pH). You will also need to take into consideration the fact that some herbicides, such as Princep, should not be used in sandy or alkaline soils. It is generally recommended that you have your soil tested if you do not know the texture, organic matter content, or pH of the soil.

Post-emergence herbicides are applied directly to the foliage of established, actively growing weeds.

These herbicides kill weed species by interfering with their normal development through the disruption of bio-chemical processes within the plant. The effectiveness of post-emergence herbicides is dependant on having adequate contact with the shoots and leaves of the target plants. Herbicide application rates, the amount of active ingredient applied per acre, will vary according to the weed species and other factors including plant size and age, water stress, air temperature, and relative humidity. Each of these factors can affect the amount of herbicide that enters the plant. Additives like crop oil concentrates, surfactants, and liquid fertilizer

solutions can help to increase herbicide uptake.

Post-emergence herbicides can be applied at any time during the growing season. However, the effectiveness of your herbicide application will decrease as weed species become larger and more established. Also, hot and dry conditions that create water stress within the plant can decrease herbicide effectiveness. Post-emergence herbicides are usually applied as directed sprays. When applied as a directed spray it is critical that you minimize contact of spray, drift, or mist with foliage, green bark or non-woody surface roots of desirable species. Some post-emergence herbicides, like Roundup 4EC, Garlon 4, and 2,4-D can be applied as a broadcast application in conifer plantations. However, broadcast applications must be made after formation of final conifer resting buds in the fall or prior to initial bud swelling in the spring. If you decide to use herbicide to control competing vegetation in your plantation please follow label directions and follow all precautionary statements.

For more information on herbicide treatments see University of Nebraska Extension publications [NF98-362 Chemical Weed Control in Tree Planting Projects, Part I - Pre-emergence Herbicides](#) and [NF98-363 Chemical Weed Control in Tree Planting Projects, Part II - Post-emergence Herbicides](#).

Finally, it has been recommended that vegetation between the rows be controlled at least as well as within the rows. However, there may be some benefit in allowing either row crops or warm season grasses to grow between these rows to provide protection for the young seedlings from hot, dry summer winds. The key to this method is not allowing the vegetation to crowd out the planted seedlings. Also, this vegetation should be disced, roto-tilled, or shredded in late autumn to remove or reduce potential cover for mice or rabbits that will feed on your seedlings over the winter.

**Supplemental watering** may be the most important thing that you can do for your seedling

during the first three years.

Your seedling will need at least one inch of water every seven to ten days throughout the growing season. When you water your seedlings, you need to fill the soil profile thoroughly to insure that the seedling roots have access to water. The best way to do that is by using a drip irrigation system or a soaker hose. If you do not have enough hose to reach your seedlings then you can fill a five-gallon bucket and pour it around the seedling slowly being careful not to expose any roots.

**Low Maintenance Grass Plantings** may be used between tree rows on sites with steep slopes or sandy soils, where erosion is likely to be a problem. Grass seeding can be done either before or after the trees are planted. Low maintenance grasses can also be seeded after tree and shrub planting projects are established or where a landowner does not wish to use clean tillage because a plantation is located near the home. Low maintenance grass plantings should not be used if highly competitive grasses, such as brome grass, are likely to invade. The Natural

Resources Conservation Service recommends that you use one of the following seeding mixtures.

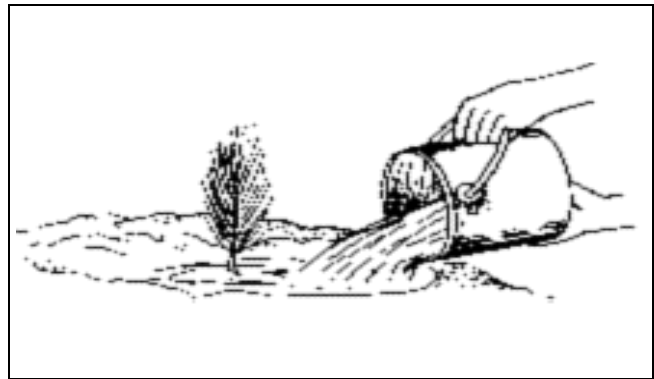
Species/Mix	Percent of Mix	PLS lbs./acre
A. Sideoats grama	100	6.8
2. Sideoats grama	60	4.1
Blue grama	40	.6
C. Sideoats grama	60	4.1
Blue grama	30	.5
Buffalo grass	10	2.3

Contact your county Natural Resources Conservation Service for standards and specifications for the proper methods of using a cover crop for seedbed preparation and for information on certified perennial grass varieties recommended for Nebraska.

**Animal Damage.**

Livestock should always be kept out of your plantation. They can destroy months of work and years of growth in a very short period of time. Livestock should be kept out of your trees to prevent destructive grazing. If tree and shrub

Resources Conservation Service recommends that you plant a cover crop, i.e., grain sorghum, annual oats, Sudan grass, etc., between the tree rows during the growing season before seeding grass. Plant grasses directly into a cover crop residue from November 1 - May 31 (optimum - March 1 - May 15). The Natural Resources Conservation Service recommends that you use one of the following seeding mixtures.



seedlings are planted in a field that will be seasonally grazed then you should install either a permanent fence or a hot-wire to prevent livestock from grazing and among the seedlings. Predators like deer, rabbits, and mice can also destroy your plantation. Mice will girdle a tree seedling close to the ground during the winter months, while deer and rabbits will browse on the buds and main stem. The best way to prevent animal damage is to keep this area clean and free from competing vegetation. Disc, roto-till, or shred vegetation in late autumn to remove or reduce potential cover and habitat for deer, rabbits, and mice.

**Remember** maintenance is an ongoing process. The benefits you hope to someday enjoy from your plantation cannot be accomplished with a single treatment. Tree planting by its very nature is a long-term commitment. Most tree species will easily live sixty to eighty years in a windbreak or shelterbelt planting. Some will live well over one hundred years.

To insure the long-term health and vigor of your plantation consider whether some of the following management activities might benefit your grove.

First, try to maintain a wide variety of species in your tree and shrub planting projects. The greater the variety of species in your plantation the less opportunity there is for insects, disease, or environmental stresses to create catastrophic losses. Dutch Elm Disease and the American elm is an excellent example of what can happen when a project is dependant on one major tree species. Next, replant new species into areas where trees are dead or dying. It is important that you maintain the integrity of your windbreak or shelterbelt system.

Finally, destroy undesirable species that invade your plantation through mechanical or chemical treatments. Over time some grass, shrub, or tree species may try to dominate and take over your plantation. To maintain the health and vigor of your plantation you will need to take steps to insure its survival and growth.

The Lower Elkhorn Natural Resources District has designed this fact sheet to answer some of the questions that you may have about the care and maintenance of conservation tree seedlings. This information is provided for the convenience of the reader and is not intended to replace personal consultations regarding specific treatments which may apply to each individual's situation.

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