Weed Control Options in Tree Plantings

Simply put, a weed is any plant growing where it is not wanted. It can be a grass, a broadleaf plant, a shrub, a vine, or a tree. A weed often has a fast-growing, aggressive root system, which competes with the establishing root system of a seedling tree or shrub for nutrients and soil moisture. Weed competition for these resources can reduce mature tree growth by as much as two-thirds.

Not only do weeds reduce survival and inhibit growth, but they also provide fuel for fires and harbor animals such as mice, rabbits, and other small mammals that damage seedlings.

Establishment periods for tree and shrub seedlings generally take at least 3 years and take longer on poorer sites. Therefore, it is important to control weeds to maximize seedling survival and growth. For best results, weed-control efforts should begin before planting and continue at least until seedlings are well-established and vigorous.

There are four main ways to combat weeds — mechanical, chemical, mulch, and barrier.

Mechanical

Cultivation is the most effective method of mechanical weed control. It includes the use of equipment such as rototillers, discs, hoes, and other similar equipment. Cultivation should be limited to less than 4 inches deep and no closer than 9 inches to the plant to avoid damaging seedling roots. Because weeds need to be kept less than 6 inches tall, cultivate several times a year as new weeds grow and become established. Tillage alone may not be sufficient to control weeds, especially in a wet year that facilitates weed germination and limits ideal soil conditions for tillage.

Mowing is another method of mechanical weed control. Although mowing reduces the buildup of fire fuel and animal cover, it can encourage undesirable perennial grass establishment and increase competition for moisture and nutrients; therefore, cultivation is preferred. Mowing may be necessary on sites where cultivation creates excessive soil erosion. Mowing also can limit seed production in taller weeds.

Where tillage and mowing are not desirable options, and where it can be safely implemented, weed flaming using a specially designed propane torch is an option. Flaming uses heat to kill weed seedlings; it does not use fire to consume the entire weed. The heat from the torch causes cells in the weed to

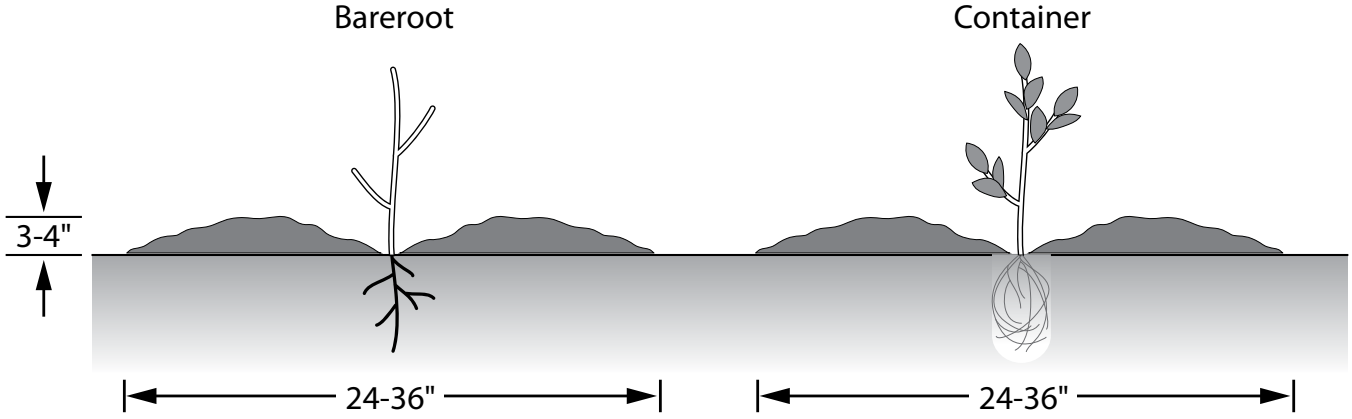

Figure 1. *Mulch reduces weed pressure around newly planted trees. Do not mound mulch onto the tree.*

burst, causing the seedling to die. Flaming is most effective on small, recently germinated weed seedlings, such as annuals in early spring or winter annuals in fall. Flaming is often ineffective as a stand-alone weed control method, but it can enhance the effectiveness of other weed control options, especially on seedlings of herbicide-resistant weeds.

Mulch

When establishing a small planting, organic mulch can be an effective way to combat weeds; however, on a large-scale planting it may be cost and labor prohibitive. Mulch not only reduces weeds but also retains soil moisture, reduces compaction, buffers soil temperature extremes, adds organic matter to the soil, and reduces potential seedling injury by eliminating the need to mow or till close to the plants.

Immediately after planting, mulch should be placed in a circle approximately 2 to 3 feet around each seedling and about 3 to 4 inches thick. A little less than 2 cubic feet of mulch is needed per tree, or about 1.5 to 2 cubic yards per 25 trees. Mulch should not be piled or mounded against the stem of the seedling (Figure 1). Suitable mulches include wood chips, straw, and bark.

Large, chunky wood chips are less likely to blow away on exposed sites. Fine-ground wood mulch, sawdust, or shredded paper may become matted and restrict infiltration of water and air, and these fine-textured sources of carbon also may remove available nitrogen in the soil as they decompose.

Barrier

The most common type of barrier is a black polypropylene material called weed barrier fabric.

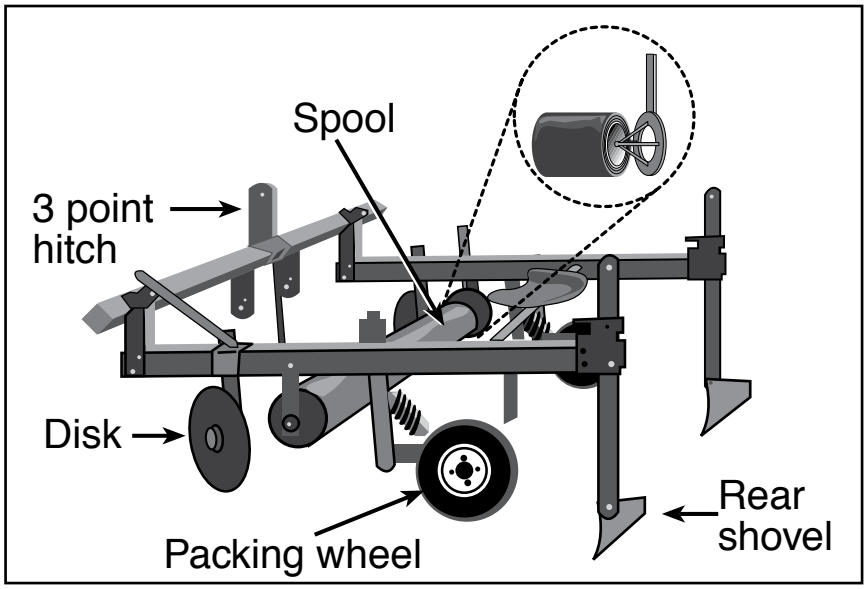

Figure 2. *Fabric mulch dispensing machine.*

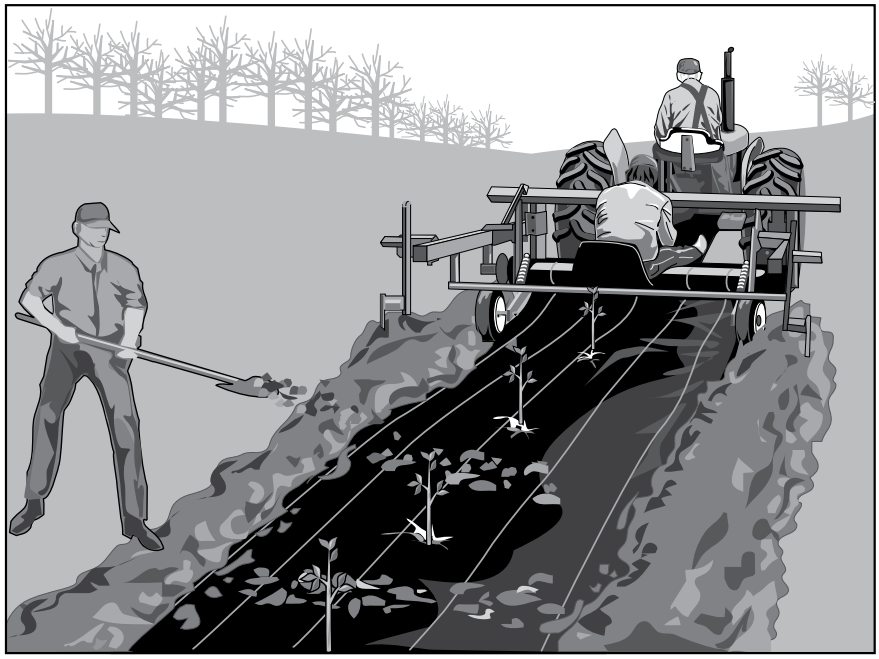

Figure 3. *Fabric mulch dispensing machine.*

It is permeable to air and water but not sunlight, so plant growth is suppressed underneath the material; however, if the top of the material is not kept clean of debris, vegetation can grow through the material from the top.

Fabric barrier is appropriate to help establish windbreaks, shelterbelts, living snowfences, and other small tree and shrub plantings. Fabric is not recommended in riparian areas that flood periodically. Flooding can lower the effectiveness of the barrier by dislocation and soil deposition. Fabric barrier inhibits root sprouting of shrubs. Root sprouting increases stem density, providing valuable wildlife habitat.

Fabric barrier is available in a variety of sizes and specifications. It can be purchased in rolls that can be applied by machine or in squares that can be applied by hand. Some product specifications that should

be considered include weight, tensile strength, burst strength, tear, permeability, thickness, and UV exposure.

Site preparation is important for seedling survival, growth, and proper application of fabric rolls. Inadequate site preparation can make proper fabric installation difficult. Soil must be plowed or chiseled to a minimum depth of 12 inches followed by discing or rototilling to remove clods or sod.

If a desirable vegetative cover exists, cultivate a minimum 10-foot-wide strip at each tree row. Applying postemergent herbicides may be necessary if cool-season grasses like brome or fescue are present. Site preparation for fabric squares also may include applying a postemergent herbicide, rototilling, or using augers.

Weed Barrier Fabric Rolls

Rolls may contain from 300 to 750 feet of fabric and range from 4- to 10-feet wide. Six-foot-wide fabric rolls are the most common in Kansas, and are applied by an implement over the seedlings immediately after planting.

A tractor-drawn dispensing machine (Figure 2) lays fabric rolls over seedlings immediately after planting. Installation begins by placing a roll on the machine spool. Fabric barrier is designed to dispense from the bottom of the roll.

Before lowering the packing wheels, unroll enough fabric to clear the rear shovels. Carefully lower the packing wheels onto the fabric. Do not crawl under the machine. Cover the end of the fabric with 6 to 10 inches of soil. At first, someone may need to stand on the edge of the fabric to keep it from moving.

Adjust the machine at the three-point hitch so the rear shovels are 4 to 6 inches into the soil. Front-mounted discs open two furrows, while the packing wheels press the fabric edges into the furrows. Packing wheels hold down the edges until rear shovels throw 6 to 10 inches of soil onto the fabric edges. During installation, it is important to make sure soil is covering the fabric edges. If the fabric is installed on a slope, water diversion bars should be angled out of the soil to direct water away from the fabric.

To apply fabric, one person sits on the fabric machine and makes a small cut in the fabric to locate each tree or shrub (Figure 3). Depending on the size of the planting, one to three people follow the machine and make finishing cuts in the shape of an "×" and pull plants through the fabric. Care should be taken to avoid cutting plants. Cuts should not exceed 12 inches in length. When excessive cuts are made in the fabric, weeds and grasses will emerge next to the tree or shrub and reduce mulch effectiveness. Though limiting the size of cut is important, it must also be large enough to prevent fabric from rubbing against seedlings. This is the advantage of an "×" cut instead of a single-slit cut.

Proper installation is crucial for planting success (Figure 4). It is important to pull seedlings through fabric immediately, especially on warm days, because the heat generated underneath the fabric can quickly kill tender seedlings. It is also possible for the lower portion of seedlings to be damaged by heat if the fabric is not pushed down against the soil surface. Air pockets can create an oven-like effect if left between the fabric and the soil. Rodents can also use this space for habitat. These problems can be reduced by walking down the middle of the fabric while pulling seedlings through or by running tractor tires along the edges of the planting furrows before installing the fabric. Tractor tires also may be run along fabric edges after installation to pack soil and further ensure that fabric will be held in place. Pins or staples should be placed every 10 feet next to a tree or shrub in the middle of the fabric for anchoring purposes.

When installation is going well, 100 feet can be installed in one minute. However, it is best

Figure 4. *Properly installed fabric pulled tight to avoid wind, with dirt placed on edges and holes for seedlings large enough to avoid girdling.*

Figure 5. *Five staples are used to hold fabric squares down.*

to be patient and avoid improper installation.

Squares

Square dimensions range from 3- by 3-foot to 6- by 6-foot; however, 4- by 4-foot squares are most common. Fabric squares generally are used on small plantings, nonlinear plantings, or when land is inaccessible to mulch-laying machines.

Fabric squares are installed by hand and are secured to the ground with wire pins. If fabric squares are purchased without cuts, make cuts before installation. An "×," approximately 6 inches long, is cut in the material at each seedling location and the plant is pulled through the opening (Figure 5).

Take care not to injure the seedling when cutting the fabric. If the opening is too large, weeds may take root in the opening as well. The squares are held in place using wire staples (9- to 11-gauge). On clay and loam soils, 6- to 8-inch staples are adequate. Sandy soils require staples at least 10 inches long. Usually five staples are used per square, one at each corner and one next to the seedling. It is easier to apply fabric squares when the soil is moist and there is no wind. Fabric squares work well when mechanical equipment cannot be used and for plantings of 300 trees or fewer.

Maintenance

Some weed control may be required within the opening next to the seedling. It is important to walk the tree rows two or three times during the growing season to pull weeds and grasses. Keep the edges and ends of fabric barier covered with soil. If weeds grow tall enough to compete for light and fall over fabric and trees, mowing between tree rows or at least along fabric edges may be necessary. In most other cases, leaving vegetation between rows reduces wind damage and provides excellent wildlife habitat. Mowing should always occur in the fall to remove winter habitat for damaging rodents.

In some cases, fabric barrier may girdle trees as the diameter of the tree exceeds the original hole. In such cases, the fabric hole should be enlarged to accommodate the tree. The fabric is photodegradable, meaning that it breaks down over time in direct sunlight. A potential downfall with fabric is that as seedlings mature and shade the material, it fails to break down. Therefore, it is recommended that the plants should be closely examined 3 to 5 years after planting to ensure that they are not being girdled by the fabric.

Sources

Fabric barrier can be obtained from a variety of sources, including county conservation districts; Kansas Department of Wildlife, Parks and Tourism; Kansas Forest Service; private wildlife organizations; or directly from the manufacturers.

Fabric barrier is more expensive than other methods of weed and grass control; however, cost-share programs may assist with the cost of purchasing and applying fabric. Some studies show survival and growth rate of trees and shrubs, as well as the amount of soil moisture, increase with fabric barrier use.

Chemical

Herbicides can be a safe and effective way to control weeds. They are available in granular, dust, liquid, or other formulations and can be applied using motorized equipment or by hand with backpack sprayers or canisters.

No matter what formulation is used, or how it is applied, it is extremely important to select proper nozzles, calibrate equipment, and follow the label directions.

Persons using chemicals for weed control are legally required to apply herbicides according to the label directions. The applicator may be liable for damages caused by improper application.

This publication serves as a guide for selecting herbicides for use in tree and shrub planting. It does not present all the information needed to make a proper selection. Herbicide selection should be based on the trees and shrubs you want to protect and the weeds you want to eliminate. Carefully read the labels of any herbicide before purchasing and applying.

The choice of a herbicide depends on four major factors: 1) the kind of tree or shrub to

be treated, 2) the weeds to be controlled, 3) application methods, and 4) the site. Select a herbicide compatible with the trees or shrubs in the planting. A herbicide recommended for one kind of plant may not be safe for another. Also consider the age of the trees and shrubs and how long they have been planted.

Types of Herbicides

Herbicides are either *preemergent*, applied before weed seeds germinate, or *postemergent*, applied after weed-seed germination. The choice between preemergent and postemergent herbicides depends on the presence or absence of vegetation. Often preemergent and postemergent herbicide are mixed to control both existing vegetation and newly germinating seeds.

Preemergent herbicides are generally applied before planting or over dormant seedlings in fall or early spring to inhibit weed seed germination and development. They are usually most effective when applied to bare soil and often require rainfall, irrigation, or light tillage to activate.

Consider site factors when selecting a herbicide. Soil type and humus content (organic matter) affect the application rate of preemergent herbicides. Generally, sandy or low humus soils require less chemical than heavier or high humus soils. While many products may require repeat applications in conjunction with other weed control options each growing season, some may require only one application. Long-residual herbicides, such as soil sterilants or bare-ground herbicides, should never be applied near desirable vegetation such as trees and shrubs.

Postemergent, or "contact," *herbicides* are applied directly to actively growing weeds and have no lasting effect in the soil. Several applications will be necessary throughout the growing season. While some postemergent herbicides can be safely applied over the top of desirable trees and shrubs, many cannot. Read and follow label application directions carefully. Protect desirable plants by shielding them with a stovepipe, bucket, or other means, or by using drift guards on the applicator wand.

Most herbicides used in tree and shrub plantings are effective against a particular group of weed species. Select a herbicide that controls the weeds present. When selecting a herbicide, consider the various formulations available and your ability to make the application. A noncomprehensive list of herbicide recommendations is provided at the end of this publication, for reference.

Application

Proper application begins by selecting the proper herbicide and using the correct equipment.

Precautions

1. Follow instructions for precautions and application rates.
2. Do not spray the foliage, stems, or bark of desirable trees with postemergent herbicides.
3. Herbicide drift is a serious problem. Only spray herbicides with low pressure (25 to 30 pounds per square inch maximum) on calm days.
4. Use special care when applying 2,4-D or other phenoxy-type chemicals. Use the amine salt formulations when possible. If the ester formulation must be used, be sure it is the low-volatile form and that the air temperature will stay below 85 degrees Fahrenheit for several hours.
5. Make sure application equipment is in proper working condition, calibrated, and free of contamination. Clean equipment immediately after use.
6. Continuously agitate wettable powder formulations for uniform application.
7. When mixing two different chemicals, be sure to determine their compatibility by checking the labels or consulting your local K-State Research and Extension office.
8. Most preemergent herbicides require sufficient moisture for activation. Water or incorporate according to label instructions to avoid reduced weed control.
9. Use lower rates of herbicide on coarse, sandy soil.

Preplant Weed Control

Weed-control efforts should begin before trees or shrubs are planted, and they should be a standard practice when hard-to-control, perennial weeds, such as bindweed, are present. Preplant weed-control practices may include growing a cover crop, repeated preplant cultivation, chemical fallow with certain nonselective herbicides, or combinations of these methods.

Often trees and shrubs are planted in areas with established vegetation that you may not want to destroy. In this situation, a nonselective, nonresidual herbicide should be applied in 4-foot-wide strips or in 4-foot-diameter circles where the trees or shrubs are to be planted.

One important advantage of preplant weed control is that certain effective herbicides that are harmful to trees and shrubs can be easily and safely applied.

Application Procedure

Trees are usually planted on a wide spacing, making either band or spot herbicide treatment most practical.

With young trees, a band treatment should be 2 to 4 feet wide (12 to 24 inches on each side of the trees). Band treatments are most

efficiently applied with power spray equipment, and while they do require more spray material than spot spraying, they require less labor.

Spot treatments are ideally suited for small plantings with widely spaced trees or when hand sprayers or small power sprayers are used. With young trees, a spot treatment should consist of a 2- to 4-foot-diameter circle around each tree.

Directed herbicide sprays can be most safely applied with hand-held sprayers. A stovepipe or other protective shield may be placed around the tree while spraying to protect it from herbicide damage. One suggestion is to create a slit up one side of the shield so the pipe can be widened and placed around the seedling rather than having to slide the shield over the seedling. This reduces the likelihood of the seedling coming in contact with any residual herbicide on the shield (Figure 6).

Calibration

Accurate calibration is the only way to know your actual application rate. If too much herbicide is applied, injury to desirable plants will occur; however, if too little herbicide is applied, the result will be ineffective weed control. Some herbicides have a narrow window of tolerance between the two consequences; therefore, check the sprayer calibration every time chemicals or application rates change. Nozzle tips should be clean, checked for wear or changes in discharge patterns, and appropriate for the sprayer being used.

Uniform application and distribution is difficult with garden-type sprayers or small power sprayers. Both application rate and spray distribution vary with changes in spray tank pressure, nozzle height, and speed over the treated area.

Special care is needed when applying selective, soil-active chemicals, such as preemergent herbicides, because overlapping of spray swaths or concentration of spray material near the trees can cause injury. Uniform application is particularly difficult with spot treatments.

To increase application uniformity, the applicator should first practice making spot treatments by spraying water on a warm, bare surface, such as a concrete slab, and observing the spray pattern. The areas that dry last received the most spray.

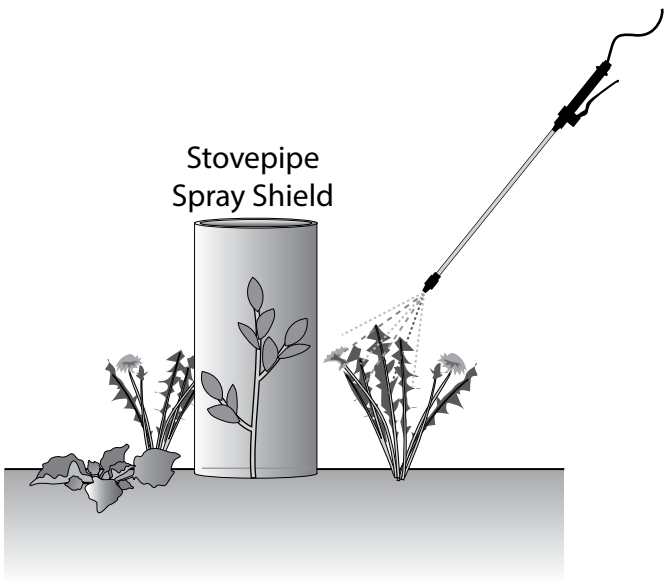

Figure 6. *Using a spray shield to exclude herbicide from contacting desirable plants allows nonselective herbicides to be safely applied after planting.*

Large, agricultural-type sprayers can be used in young plantings when the equipment does not touch the trees.

To calibrate any sprayer, determine the total amount of spray solution needed to treat the area and the amount of herbicide product to be used in the spray, according to the product label directions.

For more in-depth guidance on herbicide calibration and calculations, consult K-State Research and Extension publication *Calculating Pesticide Measurement*s, MF3100.

Combination of Methods

The best way to combat weeds is to use a combination of practices. For example, mulches can be added around individual plants, a chemical treatment can be applied to eliminate weeds within the rows, and space between rows can be mowed to reduce the availability of fuel for fires.

Effective and thorough eradication of weeds at the planting site before planting, through mechanical tillage or chemical control, allows for effective weed control during seedling establishment. Attempting to control weeds only after seedlings have been planted is often an exercise in frustration with disappointing results.

If you are not sure how to create a successful weed control program, assistance is available from your local K-State Research and Extension agent, County Conservation District, Natural Resource and Conservation Service office, or from the Kansas Forest Service.

Herbicide Recommendations

Pre-plant Treatments

Active Ingredient	Trade Names	Approximate Cost per Acre	Comments
aminopyralid	Milestone	$8 - $20	Postemergent and residual control of susceptible weeds and certain woody plants, including invasive and noxious weeds, while leaving many desirable grasses and forbs. Avoid application under conditions that may allow spray drift because very small quantities of spray may seriously injure susceptible crops. Trees adjacent to or in a treated area can occasionally be affected by root uptake, especially redbud, locust, caragana, and other legumes.
fluazifop	Fusilade Ornamec	$15 - $25	Controls annual and perennial grass weeds. Perennial grass control is enhanced by applying after resprouting following light tillage. Apply while weeds are actively growing. Add nonionic surfactant. Do not mow within one week of application.
glufosinate	Cheetah Finale Liberty	$30 - $50	Postemergent, nonselective control for many grasses, broadleaf weeds and undesirable vegetation. Warm temperature, high humidity, and bright sunlight improve performance. Gives better control in hot weather than glyphosate. Foliar spray at 1.7 oz per gallon of water.
glyphosate	Accord Rodeo Roundup	$12 - $60	Postemergent, nonselective control for grass or broadleaf weeds. Spray to wet with a 1 to 2 percent solution for herbaceous weeds and 2 percent for undesirable woody plants. The addition of 2% AMS by weight, or 17 lb per 100 gallons of water, can increase performance.
imazapyr	Arsenal Chopper Polaris	$25 - $75	Controls most annual and perennial grasses and broadleaf weeds in addition to many brush and vine species with some residual control of undesirable species.
metsulfuron	Escort MSM Patriot Rometsol	$10 - $35	Controls many weeds and deciduous trees on sites where certain conifers are growing or are to be planted. Apply after weeds have emerged or after undesireable hardwoods have broken winter dormancy and reached full leaf expansion. Can be tank mixed with glyphosate, imazapyr, hexazinone, or sulfometuron if spray is directed away from desirable plants. Should not be used on sites with soil pH above 7.9.
sulfometuron	Oust Spyder	$10 - $20	Preemergent and postemergent control of many grass and broadleaf weeds. Apply in fall prior to planting in spring. Best results may be obtained by applying before or during early stages of weed growth. May be ineffective on soils with pH above 6.9. Do not contaminate water. Can be tank mixed with metsulfuron or pendimethalin.
triclopyr	Element Garlon PathFinder	$25 - $220	Postemergent, nonselective control for many broadleaf weeds and undesirable vegetation. Apply when plants are actively growing. Add nonionic surfactant. Use higher rate on larger woody species. “3A” amine formulations are water-soluble, while “4” ester formulations are oil-soluble.

Preemergent Treatments

Active Ingredient	Trade Names	Approximate Cost per Acre	Comments
DCPA	Dachtal	$180 - $200	Controls annual grass and certain broadleaf weeds. Apply to weed-free soil immediately after planting before weeds emerge. May need to reapply for season-long control. For established plantings, apply late fall or early spring prior to weeds emerging. Does not control smartweed, velvetleaf, or ragweed. Do not contaminate water.
dichlobenil	Casoron	$380 - $600	Controls annual grass and broadleaf and certain biennial weeds. Don't apply until 4 weeks after planting. Apply on and incorporate into weed-free soil. May damage conifers, elderberry, dogwood and willows less than 2 years old. For established plantings, apply late fall or early spring prior to weeds emerging, when soil temperature is below 50 degrees.
flumioxazin	BroadStar Fortitude SureGuard	$85 - $130	Preemergent and early postemergent control for select grass and broadleaf weeds. Apply before bud break or direct spray to avoid foliage. Do not incorporate into soil; apply to weed-free soil for preemergent control of weeds. Postemergent control is best when applied to actively growing small weeds, with a surfactant, at temperatures above 65 degrees. Can be tank mixed with glyphosate if spray is directed away from desirable plants.
hexazinone	Velossa Velpar	$20 - 70	Controls many annual, biennial, and perennial herbaceous and woody weeds. Use only with the tree species (conifers) approved on the label; it kills almost all other plants. Apply only after soil settles around the roots. Apply before bud break or direct spray to avoid foliage. Kills almost all weeds up to 4 inches in height.
isoxaben	Gallery	$60 - $120	Controls certain broadleaf weeds. Apply to weed-free soil before weed emergence. Soil must settle around the tree roots prior to applying. Apply before bud break or direct spray to avoid foliage. Conifers should be well-established before treatment. Can be tank mixed with glyphosate if spray is directed away from desirable plants.
metolachlor	Pennant	$35 - $70	Controls select annual grass and broadleaf weeds. Apply after the soil has settled around the roots but before weeds emerge. Apply before bud break or direct spray to avoid foliage. Do not use in areas where groundwater is close to the surface.
oryzalin	Surflan Weed Impede	$35 - $70	Controls many grass and broadleaf weeds. Apply after the soil has settled around the roots but before weeds emerge. Apply before bud break or direct spray to avoid foliage. Can be tank mixed with glyphosate if spray is directed away from desirable plants. Can be tank mixed with simazine for broad spectrum control.
oxyfluorfen	Collide Goal GoalTender	$20 - $70	Controls certain annual grass and broadleaf weeds. Apply prior to bud break or after new growth has hardened off in conifer plantings. Care must be taken to avoid contact of spray drift or mist with foliage or green bark of deciduous trees; or apply before bud swell, or after dormancy in fall. Cultivation after application reduces effectiveness; do not incorporate into soil. Two or three applications may be needed for season-long control. Can be tank mixed with glyphosate if spray is directed away from desirable plants.
pendimethalin	Pendulum Satellite	$20 - $35	Controls most annual grass and certain broadleaf weeds. Apply before weeds emerge and after the soil settles around the roots. Do not make over the top application for first year. Apply before bud break or direct spray to avoid foliage. Use the lower application rate for short-term control and the higher rate for season-long control. Can be tank mixed with simazine.

Preemergent Treatments (continued)

Active Ingredient	Trade Names	Approximate Cost per Acre	Comments
prodiamine	Barricade Cavalcade Evade	$15 - $30	Controls many grass and broadleaf weeds. Apply to bare ground before weeds have emerged, after soil has settled around the roots. Apply before bud break or direct spray to avoid foliage. Use the lower application rate for short-term control and the higher rate for season-long control. Can be tank mixed with glyphosate if spray is directed away from desirable plants.
pronamide	Kerb	$85 - $175	**Restricted Use Pesticide**. For fall applications to woody plants established for at least one year, for both preemergence and early postemergence control of winter annual and perennial grasses and chickweed, and for preemergence control only of certain other broadleaf weeds and certain other grasses. Do NOT soil incorporate. Should be applied when temperatures are unlikely to exceed 55 degrees.
simazine	Caliper Princep	$15 - $30	Controls wide variety of annual grass and broadleaf weeds. For established plantings, apply late fall or early spring prior to weeds emerging. Apply in late fall or early spring before weeds emerge. Don't use until 1 year after planting. Use lower rate on sandy soils. Some formulations are only labeled for conifers, others include deciduous species. Can be tank mixed with pendimethalin. Can be tank mixed with glyphosate if spray is directed away from desirable plants. Do not use in areas where groundwater is close to the surface.
trifluralin	Preen Treflan	$3 - $7	Excellent preemergent control for grass and weak for broadleaf weeds. Requires incorporation in top 2-3 inches of soil within 24 hours. May need to reapply for season-long control.

Postemergent Treatments for Established Plants

Active Ingredient	Trade Names	Approximate Cost per Acre	Comments
2,4-D	2,4-D	$2 - $4	Postemergence, selective herbicide for control of broadleaf weeds. Can be applied over the top of conifers in fall or early spring before bud swelling. Care must be taken to avoid contact of spray drift or mist with foliage or green bark of deciduous trees. Volatilization of 2,4-D can impact many sensitive plants (deciduous trees, vegetables, grapes, etc.) at a great distance from applied area, especially in high temperatures and windy conditions. Amine salt or low-volatility formulations should be used to minimize off-target impact.
clethodim	Envoy Select Vaquero	$5 - $7	Postemergence, selective herbicide for control of grasses. Can be applied over the top of trees. Oil additive is required at 1 quart per acre.
clopyralid	Stinger Transline	$15 - $25	This is a selective, postemergence control of actively growing broadleaf weeds such as ragweed and thistle. Can be applied over the top of conifers established at least one year. Care must be taken to avoid contact of spray drift or mist actively growing conifers, or with foliage or green bark of deciduous trees; or apply before bud swell, or after dormancy in fall. Can damage locust and redbud.
fluazifop	Fusilade Ornamec	$15 - $25	Controls annual and perennial grass weeds. Apply while weeds are actively growing. Add nonionic surfactant. Care must be taken to avoid contact of spray drift or mist with foliage or green bark of deciduous trees; or apply before bud swell, or after dormancy in fall. Do not mow within one week.

Postemergent Treatments for Established Plants (continued)

Active Ingredient	Trade Names	Approximate Cost per Acre	Comments
glufosinate	Cheetah Finale Liberty	$30 - $50	Postemergent, nonselective control for many grasses, broadleaf weeds and undesirable vegetation. Warm temperature, high humidity, and bright sunlight improve performance. Gives better control in hot weather than glyphosate. Foliar spray at 1.7 oz per gallon of water. Care must be taken to avoid contact of spray drift or mist with foliage or green bark of deciduous trees; or apply before bud swell, or after dormancy in fall.
glyphosate	Accord Rodeo Roundup	$12 - $60	Postemergent, nonselective control for grass or broadleaf weeds. Spray to wet with a 1 to 2 percent solution for herbaceous weeds and 2 percent for undesirable woody plants. The addition of 2% AMS by weight, or 17 lb per 100 gallons of water, can increase performance. Care must be taken to avoid contact of spray drift or mist with foliage or green bark of deciduous trees; or apply before bud swell, or after dormancy in fall.
hexazinone	Velossa Velpar	$25 - $70	Controls many annual, biennial and perennial herbaceous and woody weeds. Use only with the tree species (conifers) approved on the label; it kills most other plants. Apply for brush control only after soil settles around the roots after conifers are well-established. Apply before bud break or direct spray to avoid foliage. Kills most weeds up to 4 inches in height.
metsulfuron	Escort MSM Patriot Rometsol	$10 - $35	Controls many weeds and deciduous trees on sites where certain conifers are growing or are to be planted. Apply after weeds have emerged or after undesireable hardwoods have broken winter dormancy and reached full leaf expansion. Direct spray away from conifer foliage, especially if a surfactant is used. Can be tank mixed with glyphosate, imazapyr, hexazinone, or sulfometuron if spray is directed away from desirable plants. Should not be used on sites with soil pH above 7.9.
oxyfluorfen	Collide Goal GoalTender	$20 - $70	Controls certain annual grass and broadleaf weeds. Apply prior to bud break or after new growth has hardened off in conifer plantings. Care must be taken to avoid contact of spray drift or mist with foliage or green bark of deciduous trees; or apply before bud swell, or after dormancy in fall. Two or three applications may be needed for season-long control. Can be tank mixed with glyphosate if spray is directed away from desirable plants.
pronamide	Kerb	$85 - $175	**Restricted Use Pesticide**. For fall applications to woody plants established for at least one year, for early postemergence control of winter annual and perennial grasses and chickweed. Should be applied when temperatures are unlikely to exceed 55 degrees.
sethoxydim	Poast Segment	$20 - $35	Controls many annual and perennial grass weeds. Apply while weeds are actively growing. It will slow or stop grass growth within 2 days. Burnback may take 3 weeks. Can be applied over the top of trees. Oil additive is required at 1 quart per acre.

Selective Herbicide Compatibility

Desirable Species	2,4-D	clethodim	clopyralid	DCPA	dichlobenil	fluazifop	flumioxazin	hexazinone	isoxaben	metalochlor	metsulfuron	oryzalin	oxyfluorfen	pendimethalin	prodiamine	pronamide	sethoxydim	simazine	trifluralin
Arborvitae, Oriental	X			X	X		X					X				X	X	X	
Baldcypress	X	X							X	X				X					X
Basswood (Linden)		X			X	X						X		X		X	X		
Birch, River		X		X	X		X		X	X		X	X	X		X	X		
Blackhaw		X		X		X			X	X		X		X	X	X	X		
Cherry		X	X				X		X	X			X	X	X		X		X
Cotoneaster				X	X	X			X	X		X		X	X	X	X	X	X
Cottonwood			X	X	X		X		X	X		X	X	X		X			X
Dogwood		X		X	X	X	X		X	X		X	X	X	X	X	X	X	X
Elm				X	X				X			X		X		X	X		
Euonymus				X	X	X				X					X	X			
Forsythia				X	X	X			X	X		X		X	X	X			X
Hackberry			X		X	X											X		
Hawthorn				X			X		X					X	X	X			
Hazelnut					X				X				X						
Hickory			X				X					X	X						
Honeylocust				X	X	X	X		X	X		X		X		X	X	X	X
Juniper	X	X		X	X	X	X		X	X		X	X	X	X	X	X	X	X
Lilac				X	X	X	X		X	X		X	X	X		X	X		X
Locust, Black				X	X					X			X				X		X
Maple		X	X	X	X	X	X		X	X		X	X	X		X	X		X
Mulberry									X			X							
Oak			X	X	X	X	X		X	X		X	X	X	X	X	X	X	X
Pecan		X			X		X		X			X	X	X					
Pine	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Plum		X					X		X	X			X		X		X		X
Redbud		X		X			X		X			X	X						X
Redcedar	X	X	X	X	X	X	X		X	X		X	X	X	X	X	X	X	X
Sumac			X			X													
Spruce	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X
Sycamore			X	X		X	X		X			X	X	X		X	X		X
Walnut, Black		X	X				X		X					X	X	X	X		X
Willow				X	X	X	X			X			X			X	X		X

X - indicates label-approved species compatibility per 2017 product label for at least one formulation.
NOTE: Not all formulations are alike; check label for species compatibility before applying.

Recommended Publications

The following publications are available online at: *www.bookstore.ksre.ksu.edu*
Tree Planting Guide, L596
Conservation Tree Planting Schedule, L871
Calculating Pesticide Measurements, MF3100
Windbreaks for Kansas, MF2120
Chemical Weed Control for Field Crops, Pastures, Rangeland, and Noncropland

The following publication is available online at: *newprairiepress.org/kaesrr/vol0/iss12/130/*
Synthetic Weed Barrier Mulches for Promoting Survival and Growth of Tree Seedlings, SRL135

The following publication is available online at: *www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_030984.pdf*
NRCS Kansas Forestry Technical Note, KS9

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