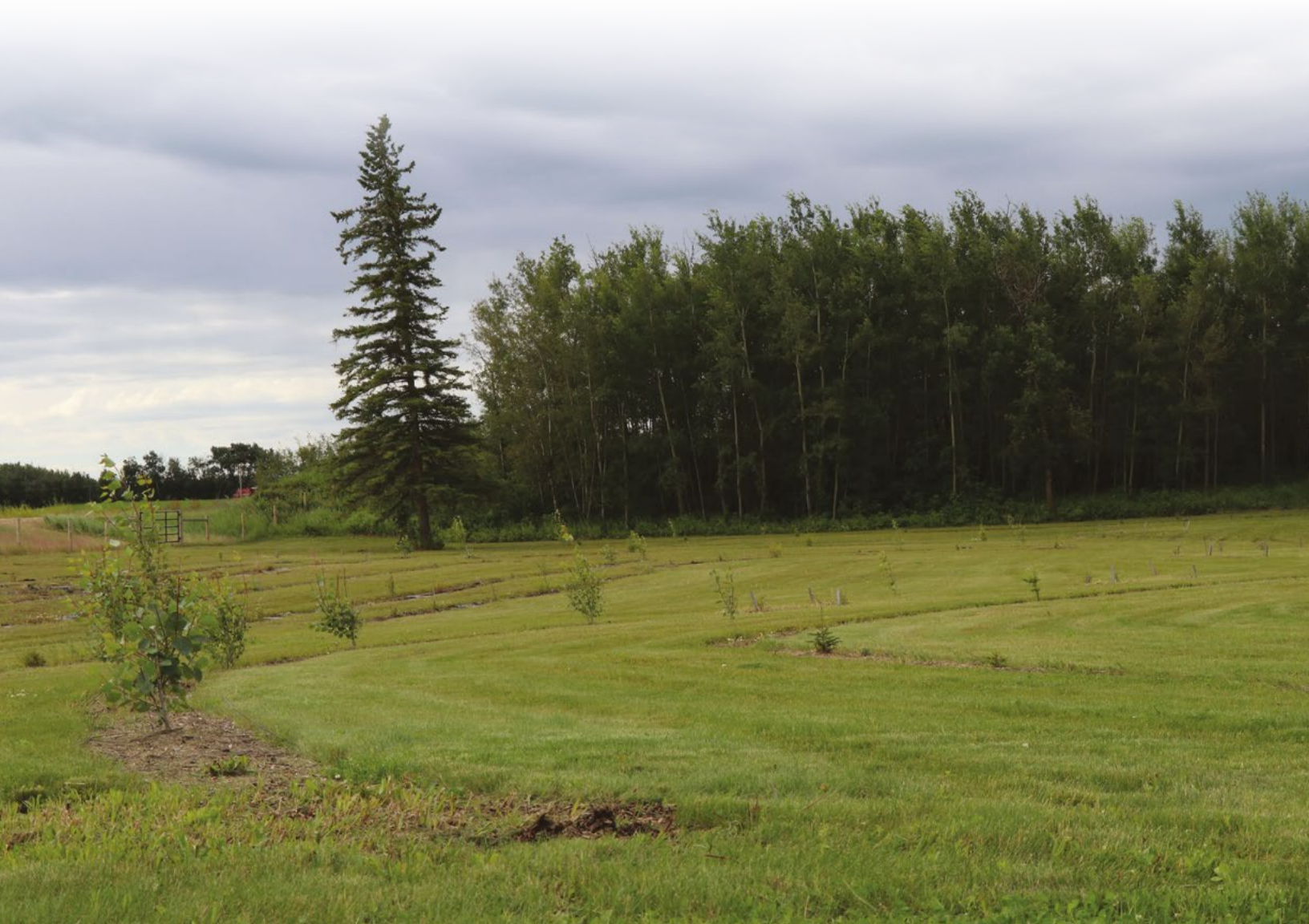
Success with ALUS Tree & Shrub Projects

How to establish and maintain tree & shrub projects in ALUS' Western Hub

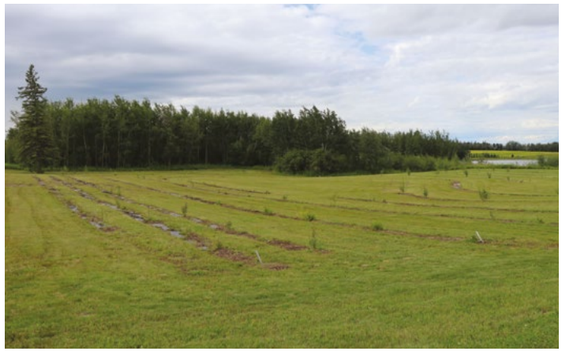
AN ALUS GUIDEBOOK



Tree & Shrub Project Types

ALUS makes use of trees and shrubs in several different types of projects, such as reforestation, ecobuffers and shelterbelts, riparian and vegetative buffers and pollinator hedgerows. Your ALUS Program Coordinator will work with you to develop a plan for the best projects for your land.

Reforestation



ALUS supports planting blocks of deciduous and/or coniferous trees to provide wildlife habitat for mammals and birds, sequester carbon, reduce soil erosion, trap snow and for many other ecological benefits. The trees can be arranged in rows with equal space between each tree and row to accommodate mowing machinery, but maximum ecological benefit will be obtained when diverse species are scattered more randomly to simulate a natural pattern. The planting design you choose ultimately depends on the tree species being used, the long-term outcome you desire and the type of maintenance you are prepared to do.

Ecobuffers and Shelterbelts

ALUS also supports ecobuffers and shelterbelts, which are rows of trees planted along the edges of fields, ditches and roads to help prevent wind-blown soil erosion, capture snow and to provide vital travel corridors for wildlife. Various tree species can be used, including a mix of coniferous and deciduous trees.

Shelterbelts tend to be less diverse, using only 1–3 species of tree, and tend to be 3 rows in design. For maximum ecological impact, consider building an ecobuffer. An ecobuffer is usually a mix of at least 3–5 species of various heights at maturity, possibly including flowering species for pollinator habitat. Ecobuffers tend to provide better canopy cover and year-round habitat.

Ecosystem Services Produced by ALUS Tree & Shrub Projects

CLEANER AIR: ALUS tree and shrub projects store carbon in their plant structures, as well as in the soil. Trees also remove certain pollutants, such as sulfur dioxide, nitrogen oxides and particulates by absorbing them through their leaves. Through photosynthesis, trees also produce the oxygen we breathe.

CLEANER WATER: ALUS tree and shrub projects help to keep streams, rivers and lakes clean by reducing soil runoff caused by wind and water erosion. Windbreaks and shelterbelts help prevent soil from being blown into waterways, where it would cause sedimentation and nutrient buildup while removing valuable topsoil from the farm. Trees are also useful in riparian buffers to help stabilize riverbanks and provide shade for aquatic habitat.

MORE BIODIVERSITY: ALUS tree and shrub projects support numerous wildlife species across Canada. Large block plantings provide habitat for wildlife, including rare and endangered mammals and birds, while flowering trees and shrubs provide food sources for pollinating insects and birds. Ecobuffers, hedgerows and shelterbelts create travel corridors for animals by connecting adjacent habitats across the working landscape.

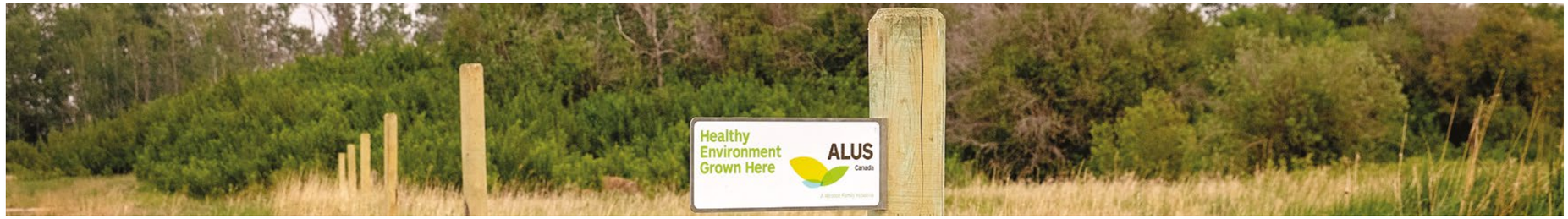
Riparian Buffers

ALUS riparian buffers are areas of vegetation (generally a combination of native trees and shrubs, with native wildflower or grass groundcover) located between agricultural land and a nearby river, stream or drain. The purpose of a riparian buffer is to slow the flow of water running off the field, filter out sediment and nutrients from the runoff water so these impurities do not enter the watercourse and to provide wildlife habitat.

Pollinator Hedgerows

ALUS is a strong proponent of pollinator hedgerows, or bands of native flowering trees, shrubs, grasses and wildflowers that are established along the edges of agricultural fields. Pollinator hedgerows are designed to attract and provide habitat for various pollinator species. The plants are chosen strategically to ensure that at least one species will be in bloom at any given time from early spring to late fall.

What to Expect while Establishing a Tree & Shrub Project



Here is an overview of what to expect over time from your ALUS tree and shrub project, in terms of objectives and maintenance tasks. Remember that your ALUS Program Coordinator is available to assist as needed.

YEAR ZERO

What to Expect

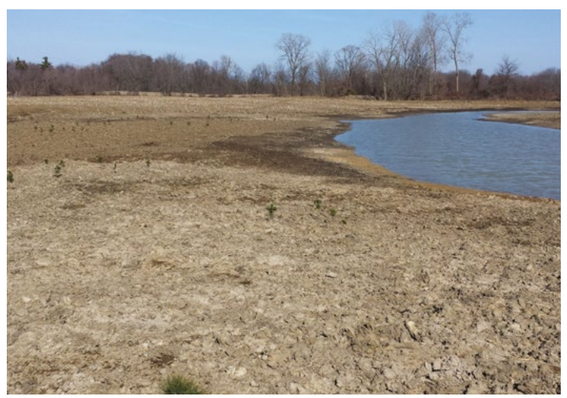
- Your site will require preparation for the planting of trees and shrubs. The degree of preparation will be site specific. For details, see **Preparing the Site for Tree Planting** in this guide.

Objectives

- Control unwanted vegetation. It is best to have a weed-free site for planting.
- Plant trees and shrubs.

Maintenance Tasks

- Prepare the site for planting next spring.
- Control unwanted vegetation to prevent competition.
- Water newly planted trees (depending on project location and size).



YEARS 1-5

What to Expect

- Trees establish root systems and grow noticeably.
- Deciduous trees may grow more quickly than coniferous species.
- Annual weeds and cool-season grasses may need to be controlled.
- Risk of damage from rodents and pests.
- Some tree mortality is normal, but if you see more than 10% mortality, contact your ALUS Coordinator.

Objectives

- Control broad-leaved weeds and grasses, as young trees can be damaged by thick vegetation.
- Monitor for pests and disease.

Maintenance Tasks

- Mow or spray to control weed competition.
- Install rodent guards or tree shelters.
- Water trees (depending on project location and size).
- Continue to monitor tree mortality.

YEARS 5-15

What to Expect

- Trees grow taller than the surrounding vegetation.
- Rodents present less of a risk.
- Less weed competition.

Objectives

- Continue monitoring for damage from pests and disease.
- Make management decisions to address any threats that are present.

Maintenance Tasks

- Perform general maintenance (prune to remove dead limbs or thin trees to reduce competition), as advised by your ALUS Program Coordinator.
- If you are having problems with non-native, invasive plants see the **Eliminating Unwanted Plants** section of this guide.
- Other than that, enjoy your ALUS tree and shrub project!

YEARS 15+

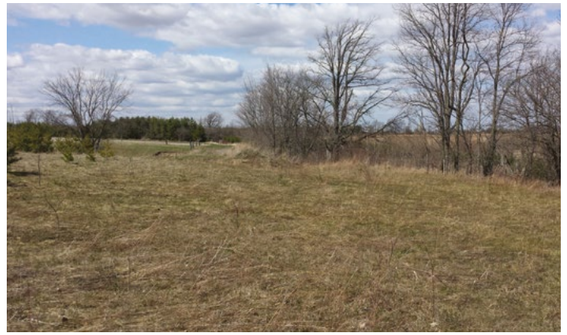
For ALUS tree and shrub projects established more than 15 years ago, please refer to our recommended resources on managing a woodlot or forest (see **Additional Resources** section of this Guide).

Preparing the Site for Tree & Shrub Projects

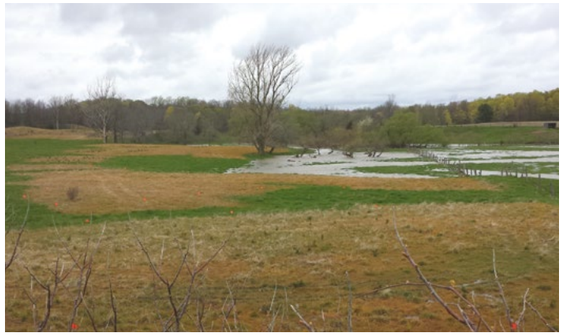
This step is critical to the success of ALUS tree and shrub planting projects. When done correctly, site preparation will save you time, energy and frustration in the first few years of project establishment. The work required varies significantly, depending on the current state of the field, the type of soil, the previous usage of the land (pasture, crops, fallow) and the type of vegetation currently in place.

When preparing your site for planting, there is one main objective: Control any vegetation that will compete with new trees for nutrients, space, water and sunlight. The goal is to create a weed-free zone of two feet around each planting site for your tree seedlings.

There are various methods of accomplishing this, as shown in the chart below. Contact your ALUS Program Coordinator to ensure you are using the correct methods for your site.



A poorly prepared tree and shrub project site.



A well-prepared tree and shrub project site.

Overview of Site-Preparation Options

Chemical Spray Application

Choose an appropriate herbicide for pre-plant pre-emergence treatment and apply at the recommended rates to kill unwanted vegetation.

For sites that are prone to erosion or have native vegetation you do not want to harm, perform a spot treatment using a backpack sprayer or hand sprayer. Otherwise, apply chemicals as needed to the entire site, respecting all regulations. Repeat this process with as many applications as needed.

Deciduous trees are more vulnerable to damage from weed competition and rodents than coniferous trees, so extra site preparation may be required depending on tree species mix.

In spring, treated areas should appear brown compared to the new growth.

Brush Cutting and Mowing

Dense, non-native shrubs, such as buckthorn or autumn olive, create obstacles for planting desired trees and shrubs and can compete with young seedlings. Use a brush cutter to remove these shrubs from your site. To completely eradicate them, you will also need to use a chemical spray application.

Mowing tall vegetation before planting can prevent damage to your new trees and shrubs commonly caused by rodents and heavy snow. Thick, cool-season grasses, such as reed canary grass, should be mowed prior to spraying to allow for better herbicide contact and to decrease competition.

Working the Land (Tilling)

You can also till your project site to break up existing vegetation and crop residue using mechanical weed control methods.

If there are dense root masses or heavy crop residue remaining in your field, tilling may not be necessary.

Tilling the soil disturbs the seed bank, so the area should be worked repeatedly for a season to lessen future competition from weeds.

What Site Preparation Method is Right for Me?

Every site is unique, so site preparation methods should be tailored to your conditions. The following guidelines apply to a typical tree- and shrub-planting site. Your ALUS Program Coordinator can provide site-specific instructions or connect you with tree and shrub experts in your area.

	Cultivated Fields (any row crop, such as corn, canola, grains)	**Pastures and Grasslands**	**Fallow or Natural Fields**
EXISTING CONDITIONS			
RECOMMENDED METHOD	Chemical application to remove weeds, and/or Work and pack the soil repeatedly until there is little vegetation remaining.	Multiple chemical applications, followed by tilling. Apply chemicals as needed to kill the weeds.	Mowing (to remove woody stems) or Mowing followed by a chemical application or Multiple chemical applications. AND Work and pack the land (site-dependent)
COMMENTS	Row-cropped fields may require little site preparation.	These sites are dominated by cool-season grasses and undesirable vegetation. A full year of preparation is required to ensure all non-native plants and seeds are eliminated.	These sites are often dominated by early successional weeds and require a full year of preparation to ensure all non-native plants and seeds are eliminated.

Tree & Shrub Project Maintenance

ALUS tree and shrub projects are low-maintenance once mature, but some management techniques are required in the beginning to ensure good results for many years to come.

Proper maintenance practices and management techniques encourage the growth of healthy trees while controlling or reducing pests, diseases and non-native or invasive weeds. This ensures your ALUS tree and shrub project grows into a beautiful, healthy landscape producing many ecosystem services of benefit to the environment and to your community.

These maintenance techniques can be used alone or in combination, as your circumstances and resources permit. Always contact your ALUS Program Coordinator to ensure you are using the most appropriate maintenance method, at the right time, for your site's unique conditions.

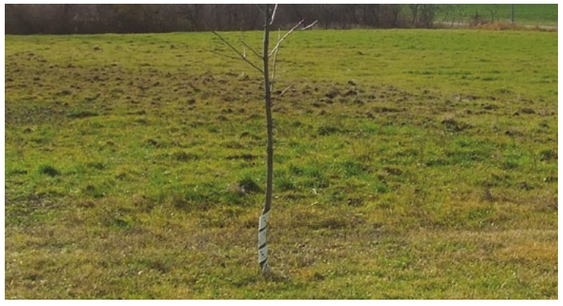
General Maintenance Techniques

Rodent Guards (Tree Shelters)

Why: Young deciduous trees are vulnerable to damage by rodents that shelter in thick vegetation and eat the soft bark of your trees and shrub seedlings.

When: Install guards in the fall and leave on trees until after the last frost in spring.

How: Install manually. This practice is labour intensive, so it may be impractical for large sites.



Mowing

Why: Mowing is the best option for routine maintenance, as long as your trees have been planted in rows that accommodate your mower. Planting a native ground cover at the same time as you plant your trees can decrease the need for mowing.

When: Mow as needed in year one. Vegetation that is taller than your trees and shrubs will prevent sunlight from reaching them, while thick vegetation will compete for nutrients and water. Mowing in late fall can prevent trees from being crushed by heavy snow in the winter.

How: Use a tractor with a rotary implement, cutting at a height of 6 to 8 inches. After mowing, leave all biomass on the site.

Chemical Control

Why: Chemical controls kill aggressive non-native plants, such as autumn olive, buckthorn and reed canary grass, that will compete with your young trees and shrubs.

When: Late fall or early spring.

How: Chemical control can kill your trees if sprayed too close to their roots, so protect young trees by placing a barrier between the trees and your sprayer and spot-spray the areas with problem species.

Pruning Dying or Damaged Limbs

Why: Pruning damaged and dying limbs will help maintain the strength of a tree. Some trees are prone to diseases. If an affected limb is not removed, it will kill the tree and spread to surrounding trees.

When: Deciduous trees should be pruned when they are dormant; early spring is best. Coniferous trees are generally only pruned in cases of disease. Pruning dead branches can be done any time of the year, as long as you are not cutting into living tissue.

How: If cutting away a diseased branch, always cut back to the healthy wood. Disinfect your tools between cuts to prevent spreading the disease.

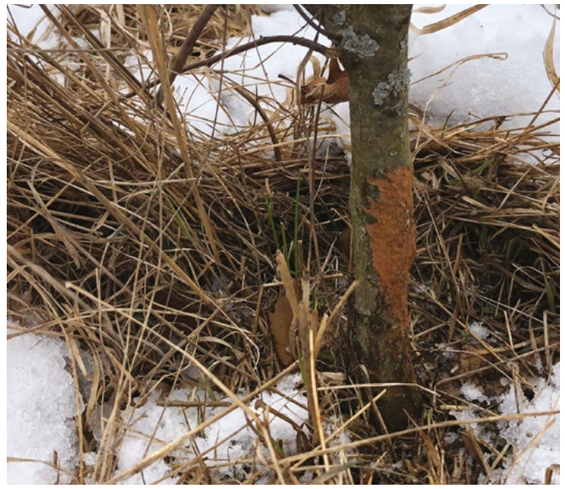
Mulch or Mats

Why: Other plants will compete with your trees for resources and shade out the sunlight.

When: Mulch can be added as soon as your trees are planted.

How: Basically, mulch is a layer over the soil that slows or inhibits the growth of other plants. Several mulch options exist, including loose mulch or mats made from biodegradable plastic, pulp, cardboard, newspaper, hemp or even wool. The mulch you choose may depend on supply availability, duration of protection needed, or other factors. Speak to your ALUS Coordinator about the various options available locally.

Managing Invasive Species, Diseases & Pests



Young trees are susceptible to damage from rodents.

Controlling unwanted vegetation is important to ensure the health of your ALUS tree and shrub project. Aggressive invasive species pose a threat to native tree species. Some invasive species to look out for include: autumn olive *(Elaeagnus umbellata)*, common buckthorn *(Rhamnus cathartica)*, and common barberry *(Berberis vulgaris)*. See the **Eliminating Unwanted Plants** section for information on managing these invasive species. For information on managing invasive species, please refer to the resources from the Alberta Invasive Species Council and the Identification Guide for Alberta Invasive Plants listed in the **Additional Resources** section of this Guidebook.

In addition to pressure from aggressive plant species, it is important to monitor your ALUS tree and shrub project for evidence of damage by rodents, deer, and diseases such as Western gall rust *(Peridermium [Endocronartium] harknessii)* or yellowheaded spruce sawfly *(Pikonema alaskensis)*.

Maintenance Challenges

CHALLENGE	OPTIONS
My trees are dying.	Death of a few trees, depending on the size of the planting, is not uncommon. If more than 10% of your planting has died, contact your ALUS Program Coordinator.
Rodents are chewing the trunks of my trees.	Control vegetation around trees and install rodent guards in late fall.
Some branches of my trees are discoloured; I see cankers or masses on my trees' branches or trunks; or my trees seem to be growing in a strange pattern.	Suggests that a disease or pest may be affecting your trees. Contact your ALUS Program Coordinator or local horticulturalist for guidance.
There are so many weeds, I can't find my trees.	Use a control method to remove some of the unwanted vegetation. Protect trees while conducting control measures.
I do not have the equipment, chemicals or licenses required to do the maintenance and/or site preparation work.	Contact your ALUS Program Coordinator. They can help connect you with individuals/businesses to provide these services.

Eliminating Unwanted Plants from ALUS Tree & Shrub Projects

Non-native plants and aggressive grass species are undesirable species in an ALUS tree and shrub project. Regular maintenance is critical and the following practices can be used to eliminate these unwanted plants.

Chemical Spot Treatment

Spot treatment is used when targeting sites with small patches of unwanted plants or scattered weeds. This method uses chemicals sparingly in comparison to broadcast chemical controls.

When: This method can be used any time of year, but it is best to apply chemicals in the spring and during dry conditions to prevent run-off into waterways.

How: Spray individual weeds or small patches of unwanted plants using a backpack sprayer with an approved and appropriate herbicide. Be aware of your proximity to the trees: herbicides will kill your trees if sprayed too close to their roots.

Stem Cutting

Stem cutting is less effective than the stump treatment, but an alternative if you do not want to use herbicides. This is only feasible for sites with a limited number of woody stems present as it can be very labour-intensive.

When: This method can be used any time of year, but it is most effective in early August.

How: Cut undesirable shrubs or trees as low to the ground as possible, using loppers or a hand saw for small stems, and a gas-powered brush-cutter for larger stems or patches of trees. If you are targeting a species prone to suckering, repeated cutting may be necessary.

Hand Removal and Chemical Application (Stump Treatment)

This method is useful on sites that have been overrun by woody shrubs. It involves cutting unwanted woody vegetation, followed by herbicide application on the stumps. This is only feasible for sites with a limited number of woody stems present, as it can be very labour-intensive.

When: This method can be used any time of year, but is optimal in the late summer (August).

How: Cut invasive trees or other woody species by hand, then brush a broadleaf herbicide onto the stump within five minutes. Watch for sucker growth and repeat the herbicide application if needed. Young trees must be protected from contact with the herbicide.

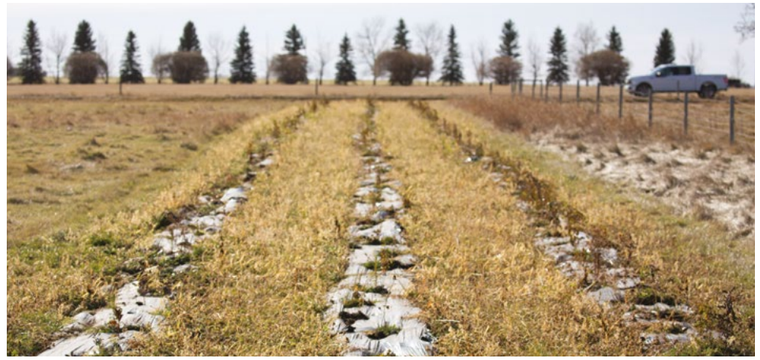
Chemical Spray Application/ Broadcast Spraying

Chemical spray application is useful for large sites in poor condition that are overrun with unwanted weeds.

When: Spray in early spring.

How: Trees must be protected from any chemical sprays. Spot-spray the unwanted vegetation in close proximity to your trees.

Additional Resources



A shelterbelt planted within biodegradable plastic mulch

ALUS encourages participants to work closely with other knowledgeable agencies in their area. The following groups have created good resources providing information on a number of topics that, when used in combination with this ALUS guide, will help you establish and maintain a successful tree planting project.

Your Municipality

In Alberta, most municipalities have access to professionals, such as weed experts, horticulturalists and agricultural fieldmen, some even run tree planting programs. Since municipalities in Alberta also deliver the ALUS program, they are a great place to seek support on a number of topics.

Agroforestry and Woodlot Extension Society (AWES)

AWES provides a wide variety of woodlot and forest management publications on their website.

Tel: 780-643-6732

Website: AWES-ab.ca

Alberta Agriculture and Forestry

Alberta Agriculture and Forestry provide several resources for preparing and maintaining tree planting projects.

Tel: 780-427-2711

Website: Alberta.ca

Alberta Invasive Species Council

We recommend the Alberta Invasive Species Council as a source of information about invasive plant species and best management practices.

Tel: 587-999-0954

Website: abinvasives.ca

Identification Guide for Alberta Invasive Plants

The Alberta Open Government Program provides a data portal that hosts many valuable resources, including on invasive plants.

Website: open.alberta.ca

About this Guide

This booklet is part of the ALUS Guidebook series, illustrating the types of ALUS projects available to participating farmers and ranchers.

ALUS is a national program helping farmers and ranchers produce cleaner air, cleaner water, more biodiversity and other ecosystem services in their communities. Specifically, ALUS helps farmers and ranchers enhance wetlands, plant shelterbelts, improve riparian buffer zones, create habitat for pollinators and other wildlife, and establish other types of projects to produce ecosystem services. As an Alberta Emerald Award-winner—and guided by a Clean 16 Award-winning team—ALUS Canada is a recognized leader in sustainability that is revolutionizing the way Canadians support the environment.

For more information, please visit ALUS.ca

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The ALUS Canada Guidebook Series is made possible in part by the Government of Canada and the Government of Alberta through the Canadian Agricultural Partnership.

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