



Success with ALUS Grassland Projects

How to establish and maintain grassland
projects in ALUS' Eastern Hub

AN ALUS GUIDEBOOK



PHOTO: ALUS Lambton / Ontario NativeScape

Types of Grasslands

Native Tallgrass Prairie



A Tallgrass Prairie (TGP) is a diverse, open landscape native to southern Ontario that is bursting with life. TGP is dominated by flowering plants called forbs and heat-loving, warm-season perennial grasses that grow in clumps or bunches rather than a solid carpet. These non-invasive plants make great neighbours for productive agricultural fields and can prevent more aggressive species from growing.

The TGP landscape is an early-successional habitat that has traditionally thrived on the presence of periodic fires. The grasses are not harmed by fire, due to their extensive, durable root systems.

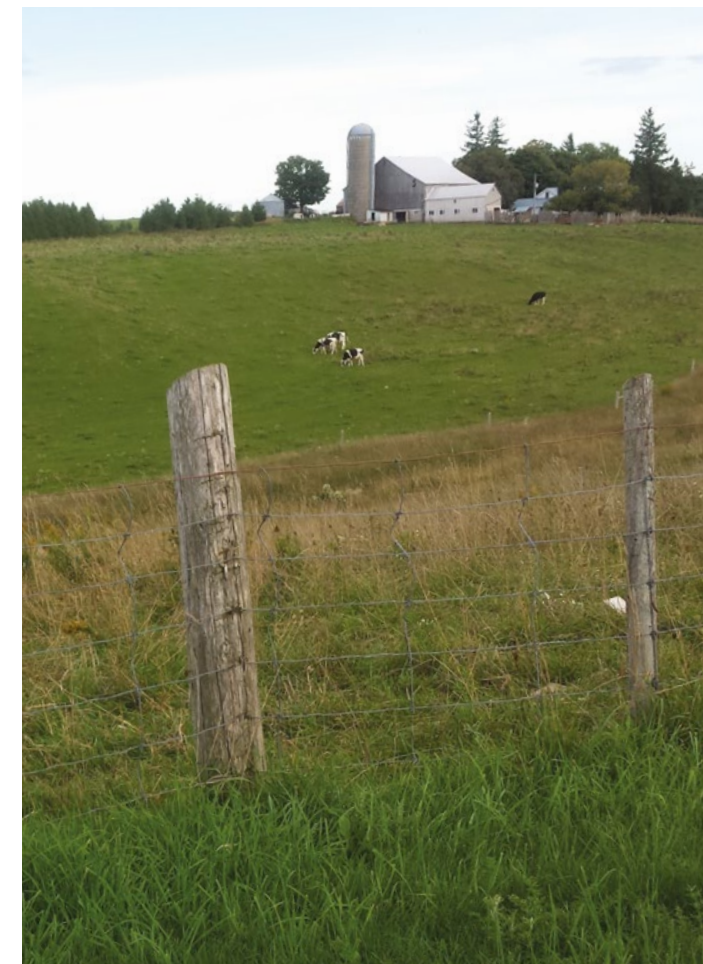
Some of the plants grow up to 2.5 metres (8 feet) tall during the late spring and summer months, with roots that extend 3 to 4 metres (10 to 13 feet) into the ground. As the roots break down, they add organic matter to the soil.

TGP is drought-tolerant, thrives on nutrient-poor soil, and is low-maintenance once established. It is also an excellent habitat for a variety of wildlife species and has many other ecological benefits.

Ecosystem Services Produced by ALUS Tallgrass Prairie Projects

- **CLEANER AIR:** ALUS Tallgrass Prairie projects help to sequester (store) carbon in the soil, with a vast root system that extends 3 to 4 metres (10 to 13 feet) into the ground.
- **CLEANER WATER:** ALUS Tallgrass Prairie projects help to keep streams, rivers and lakes cleaner by reducing soil runoff caused by wind and water erosion. Their deep root systems increase organic matter, improve water infiltration and strengthen the structure of the soil to help curb erosion.
- **MORE BIODIVERSITY:** ALUS Tallgrass Prairie projects support an otherwise declining ecosystem in Canada, providing year-round wildlife habitat for a wide variety of pollinating insects, birds and small mammals.
- **POLLINATORS:** ALUS Tallgrass Prairie projects feature native flowering plants that attract pollinators and provide nectar from spring to fall. And because the grasses grow in clumps or bunches rather than a solid carpet, they preserve some bare ground and provide important habitat for Ontario's native ground-nesting bee species.

Non-Native Grasslands



Agricultural Grasslands

Well maintained and diverse pastures and hayfields are important habitat for many grassland bird species, mammals and pollinators. By delaying haying or grazing until after July 15, you can help maintain nesting habitat for grassland birds, such as the bobolink and eastern meadowlark.

We recommend the Ontario Soil and Crop Association's helpful guide: "Farming with Grassland Birds: A guide to making your hay and pasture bird-friendly" for more information on managing agricultural grasslands to balance farming and habitat needs. (See Additional Resources section for where to find this guide).



Cool-Season Grasslands

Cool-season grasses, such as orchard grass or perennial ryegrass, may be planted as field setbacks, grassed waterways, or buffers. While warm-season grasses provide greater long-term benefits for wildlife, erosion- and sediment-control, and nutrient uptake, cool-season grasses can provide some benefits in specific conditions. Cool season grasses usually produce dense stands within two years, providing erosion-control and sediment-trapping benefits sooner than warm-season grasses. Additionally, as they start growing earlier in the spring and continue later in the fall, they continue to provide nutrient uptake in cooler seasons when warm-season grasses are dormant.

What to Expect while Establishing a Grassland Project



It takes three to five years to fully establish a Tallgrass Prairie ALUS project, and special attention is important during site preparation and during the first of establishment. Here is a sneak preview of what to expect for the first few years, in terms of objectives and maintenance tasks each year. Remember that your ALUS Program Coordinator is available to assist as needed.

YEAR ZERO

What to Expect

- Site preparation: Your site will require varying degrees of site preparation to get it ready for planting a TGP.
- Weed seeds: Undesirable plant seeds may be lying dormant in the soil. This seedbank may require a combination of methods and several rounds of weed removal, over one or more growing seasons, to control the weeds.

Objectives

- Remove all existing vegetation, unless it is a remnant prairie site.
- Prepare a smooth, firm seedbed to increase germination rates.
- Eliminate the seedbank, as much as possible.
- Get your TGP seeded!

Maintenance Tasks

- Perform site preparation to be ready for seeding in spring or late fall.



YEAR ONE

What to Expect

- TGP seedlings will be channeling their energy into root growth.
- Annual weeds are most likely present and may be the only thing you see.
- Increased wildlife activity.

Objectives

- Control weeds: this vegetation will compete with the young TGP plants for nutrients, water, and sunlight.
- Perform weed maintenance before undesirable plants go to seed or shade out your TGP plants.
- These actions will create optimal conditions for TGP plant growth.

Maintenance Tasks

- Perform general maintenance (burn or mow before the weeds form mature seeds (prior to weed seed-head establishment, a.k.a. weed seed-set).
- If necessary, apply chemical controls on the entire site to reduce weed competition.



YEAR TWO

What to Expect

- TGP plants will begin to channel more energy into above-ground growth.
- Many perennials will become established and may bloom.
- If you maintained your prairie well in year one, you will see fewer annual weeds in year two.
- Your TGP project will provide habitat for a variety of species.

Objectives

- Continue monitoring for encroachment of woody plants and other invasive species.
- If needed, perform weed maintenance before undesirable plants go to seed.

Maintenance Tasks

- Do nothing (only if there is no pressure from undesirable species).
- Perform general maintenance (burn or mow prior to seed set).
- If you are having problems with non-native, invasive plants or woody stemmed plants, see section on “Eliminating Unwanted Plants.”



YEAR THREE

What to Expect

- By year three, a properly established ALUS Tallgrass Prairie project becomes a diverse tapestry of tall, clumping grasses and flowering native plants.

Objectives

- Your grassland should be buzzing with bees, sustaining a wide variety of birds and wildlife, and producing valuable ecosystem services that benefit your community.

Maintenance Tasks

- Tallgrass Prairie ALUS projects are low-maintenance once established, but some management techniques are recommended. See the “Grassland Project Maintenance” section in this Guidebook.



Preparing the Site for Grassland Projects

This step is critical to the success of any grassland planting. 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, type of soil, past land usage (pasture, row crops, fallow) and current vegetation.

When preparing your site for planting, there are two main objectives. How well you address them will determine the success of your project.



A poorly prepared grassland project site

Objective 1. Eliminate any non-native or aggressive vegetation that will grow and compete with new grassland plants for nutrients, space, water, and sunlight. 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.

Objective 2. Create optimum seed-to-soil contact by developing a smooth, firm seedbed, which increases the germination rates of your seeds.



A well prepared grassland project site

Overview of Site-Preparation Options

- Option 1. Chemical Spray Application**
Use a glyphosate-based herbicide at the recommended rates to kill unwanted vegetation.
- Apply chemicals as needed to the entire site or perform a spot treatment using a backpack sprayer for sites that have a mix of native species you do not want to remove. Repeat this process in as many applications as needed.
- Option 2. Plant Glyphosate-Resistant Soybeans**
The year prior to planting your prairie, plant your site with glyphosate-resistant soybeans and perform as many chemical applications as needed using a glyphosate-based herbicide before harvesting the beans.
- Option 3. Prescribed Burn**
Contact your program coordinator to be connected to a helpful resource and ask your local fire department about rules and regulations in your area.
- Spring burns are recommended.
- Option 4. Mowing**
Mow the existing vegetation on your site using a flail mower at the highest setting to cut off the weeds' seed heads while leaving tall stems for as much soil coverage as possible.

- Mow prior to weed seed-set to help reduce the seed bank.
- Mow in the early fall if you are targeting woody stems. Repeated mowing is effective at weakening the root system over time in areas where there are large amounts of invasive plants or woody stems.
- Option 5. Work the Land (Tilling)**
Till your site to create a smooth seedbed.
- If you previously had a row planting there, and there is no heavy residue or dense root masses remaining, tilling may not be necessary.
- Use a field cultivator to break up the soil until there is less than 20% of plant residue on the surface.
- For all these options: Pack the Soil**
The last step to be completed before planting is to pack the soil
- Packing the soil is required before seeding, to ensure the seed will not be buried too deeply for germination.
- In a properly packed seedbed, an adult shoe print should not sink deeper than two inches into the soil.
- Use a cultipacker (ridged roller) to compress the soil on the entire site, until it meets the guidelines above.

What Site-Preparation Method is Right for Me?



Every site is unique, and the way each site is prepared for planting will need to be tailored to your site's conditions. The following guidelines apply to a typical planting site. Some sites can be prepared without the use of glyphosate, but tilling the soil disturbs the seed bank, therefore the site should be prepared a season in advance, and the area worked repeatedly to lessen competition from weeds.

EXISTING CONDITIONS	Cultivated Field: Any row crops	Corn Field	Pastures & Grasslands	Abandoned Fields	Existing Native Tallgrass Prairie
RECOMMENDED METHOD	Chemical application to remove weeds and/or Work and pack the soil repeatedly until there is little vegetation remaining.	Chemical application or Prescribed burn to remove weeds and/or Work and pack the soil repeatedly until there is little vegetation remaining	Multiple chemical applications followed by tilling and packing (if the field is smooth, tilling is not required). Plant glyphosate-resistant soybeans. Chemical applications as needed	Mowing or mowing followed by a chemical application or prescribed burn or multiple chemical applications while growing glyphosate-resistant soybeans. AND Work and pack the land (site-dependent)	Do not alter the site in any way. Contact your ALUS Project Coordinator for the most appropriate action.
COMMENTS	Soybean residue is the ideal site to plant grasslands because it provides a flat, firm, relatively weed-free site.	It is ideal to burn in the spring, or to disc in the fall before planting, to promote stalk decomposition.	The sites are often dominated by cool-season grasses and undesirable vegetation and require a full year of preparation to ensure all non-native plants and weed seed banks 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 weed seed banks are eliminated.	These sites are rare, and the method of preparation will depend on the existing vegetation.

Grassland Project Maintenance

Tallgrass Prairie ALUS projects are low-maintenance once established, but some management techniques are useful to help recreate the conditions that have historically maintained the health of Tallgrass Prairie landscapes.

Employing proper maintenance practices and management techniques will help ensure your ALUS grassland project grows into a beautiful, healthy landscape producing many ecosystem services of benefit to the environment and to your community.

General Maintenance Techniques

Some regular maintenance is required to maintain the health and vigor of the site and to control non-natives, invasive species and woody stemmed plants.



Prescribed Burns

Why: Kills non-native plants, as well as shrubs and trees, which are not meant for a grassland. It also eliminates dead plant material allowing sunlight and water to penetrate the soil, while nutrients from the burn return to the ground.

When: As a general guideline, perform a prescribed burn every three to five years, in the early spring.

How: ALUS does not provide detailed information on how to conduct a prescribed burn, as local fire departments determine the current rules and regulations in your location.

These maintenance practices encourage the growth of a healthy native prairie stand while controlling or reducing woody, non-native, or invasive plants that threaten to take over.

The techniques can be used alone or in combination, as the circumstance 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.



Mowing

Why: Mowing is the next-best option for routine maintenance, if you cannot perform a prescribed burn. It is used to prevent invasion by trees and shrubs and to reduce weed pressure. Each site must be individually monitored.

When: Mow as needed in year one. Once the TGP is established, mow every two to five years for maintenance. The ideal mowing time is prior to the weeds setting their seedheads. Mow after July 15 in order to allow grassland birds to complete nesting and fledge their young. Mowing in mid-August is ideal for reducing woody invasion. If you are targeting a species prone to suckering, repeated mowing may be necessary.

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. Consider only mowing a portion of your site each year, to maintain habitat year-round.

Managing Invasive Species



Two invasive species encroaching on an ALUS project site in Ontario: European common reed (*Phragmites australis*) on left, Autumn Olive (*Elaeagnus umbellate*) on right.

Weed control in grasslands is very important. While common annual weeds will be present during establishment, it is important to monitor your grassland on an on-going basis for more aggressive, invasive species.

Some species are commonly known to encroach on grassland projects in ALUS' Eastern Hub.

Look out for Common Buckthorn (*Rhamnus cathartica*), Autumn Olive (*Elaeagnus umbellate*), Giant Hogweed (*Heracleum mantegazzianum*) and Wild Parsnip (*Pastinaca sativa*).

For information on managing invasive species, please refer to the resources from the Ontario Invading Species Awareness Program and Ontario Invasive Plant Council listed in the “Additional Resources” section of this Guidebook.

Maintenance Challenges

CHALLENGE	OPTIONS
I have weeds, shrubs, or small trees scattered throughout my site.	Prescribed burn every 3-5 years, and mowing (annually for years 1-3, then every 3-5 years)
My entire site is covered with weeds.	Chemical control
My site has weeds scattered in small patches.	Mowing (repeatedly), or mowing and chemical control
I have individual woody stems or small patches of them on my site.	Stump treatment or stem cutting
My site lacks prairie species.	Over-seeding (site dependent, contact an ALUS representative)
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 Grassland Projects



Non-native plants, weeds, woody plants and shrubs are undesirable species in an ALUS native grassland project. Regular maintenance is critical, and the following practices have been used to eliminate these unwanted plants.

Chemical Spray Application

Chemical spray application is used when targeting large sites in poor condition and overrun with unwanted weeds. Do not use this method on sites with native forbs.

When: Spray in early spring while prairie species are still dormant.

How: Apply a selective broadleaf herbicide.

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 wide-spread chemical control.

When: This method can be used any time of year, but it is best to apply chemicals in the spring before prairie plants are actively growing.

How: Spray individual weeds or small patches of unwanted plants using a backpack sprayer with a glyphosate-based herbicide. Be cautious on sites with forbs; over-seeding may be required.

Mowing and Chemical Application

This method is used on sites that have been overrun by woody stems and have too many to manage by hand. It involves mowing large portions of the site to weaken stems, followed by chemical control. Do not use this method on sites with forbs.

When: Mowing must not be performed before July 15 to allow grassland birds to complete nesting and fledge their young. If you are combatting a woody invasion, you can act in mid-August. Otherwise, for regular control of woody encroachment and general maintenance, wait until mid to late fall, when prairie grasses have gone dormant to avoid harming them.

How: A mix of mowing and chemical controls as described above.

Hand Removal and Chemical Application (stump treatment)

This method is used to combat woody encroachment to prevent your prairie from turning into a forest. This is used on sites where you only have individual stems or small areas to treat.

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

How: Invasive trees or other woody species are cut by hand and then a broadleaf herbicide is brushed onto the stump immediately. Depending on species, watch for sucker growth and repeat the herbicide application. This is only feasible for sites with a limited number of woody stems present, as it can be very labour-intensive.

Stem Cutting

This method is used to combat woody encroachment to prevent your prairie from turning into a forest. This is used on sites where you only have individual stems or small areas to treat. It is less effective than the stump treatment, but an alternative if you do not want to use herbicides.

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

How: Cut 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. This is only feasible for sites with a limited number of woody stems present as it can be very labour-intensive.

Additional Resources



ALUS staff enjoying a successful TGP project in Norfolk County, Ontario. Photo: Splash Photography

ALUS encourages ALUS communities and 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 grassland project.

Tallgrass Ontario

For information on topics ranging from site preparation and planting to species identification and management, including the detailed “Landowners Guide to Tallgrass Prairie.”

Tel: 519-674-9980

Website: TallgrassOntario.org

Ontario Soil and Crop Improvement Association

A very useful source of information, especially their grassland birds workbook, “Farming with Grassland Birds: A guide to making your hay and pasture bird friendly.”

Tel: 519-826-4214 / 1-800-265-9751

Website: OntarioSoilCrop.org

Ontario Invasive Plant Council

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

Tel: 705-741-5400

Website: OntarioInvasivePlants.ca

Ontario Invading Species Awareness Program

Another great source of information on invasive species.

Tel: 1-800-563-7711

Website: InvadingSpecies.com

About this Guide

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

The ALUS program provides planning advice and technical expertise for the design and implementation of each project through its local ALUS Partnership Advisory Committees. ALUS participants receive an annual, per-acre payment to manage and maintain their ALUS projects over the duration of their contract. During this time, ALUS projects are independently monitored, verified and audited to ensure they are producing ecosystem services for the community.

For more information, please contact your closest ALUS Program Coordinator.

See **ALUS.ca** for contact details.

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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 windbreaks, improve riparian buffer zones, create habitat for pollinators and other wildlife, and establish other types of projects to produce ecosystem services. For more information, please visit ALUS.ca

ALUS.ca

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