

What is Foxtail?

Foxtail Barley (foxtail) is a perennial grass that can grow up to 1 to 2 feet tall within the City of Lethbridge. Foxtail is not a controlled plant species found on the list of provincially regulated plants or the City of Lethbridge bylaw list, however it can be dangerous to pets. For this reason, City of Lethbridge staff control foxtail on public property by mowing and trimming where it is abundant and work with property owners to control their foxtail, particularly in vacant lots.

What Happened in 2021?

Reduction in mowing and staff numbers, drought that left areas of high salinity exposed allowing for seed germination. No spraying of medians, this allowed for seed germination in areas usually managed with herbicide. More development with vegetation in medians and roadways will require a more robust pre-emergent program in the future.

What the City Has Done So Far

The Parks & Cemeteries department performed pre-emergent spraying in the fall of 2021. Planting beds and medians were sprayed at 98 locations.

For 2022 season, the Parks & Cemeteries department received approval from City Council to reallocate operating funds to hire more staff to support this work:

- An additional 7 labourers to assist with mowing and trimming
- An additional 12 labourers to perform work on shrubs
- An additional 2 chemical applicators
- One-week early start for seasonal staff to better prepare for the 2022 season

Mitigation Plan

With the Integrated Pest Management Plan (IPM), there are 6 steps:

1. Monitor: Is there a problem?
2. Identification: What is the pest?
3. Know the Target Pest Biology: Will it be a long-term problem or could it be naturally managed in a short time?
4. Determine an Action Threshold: Do you need to act?

5. Select Management Plan: What is the best treatment?
6. Evaluate: Did it work? What went well? What should change?

Step 1: Monitor: Is there a problem?

Yes, we have determined that there is potential for negative impacts on animals and citizens of Lethbridge due to foxtail growth. Some concerns are visual dislike, fire hazards and issues impacting animal and human safety. Drooling and lack of appetite can be caused by the mouth of the animal being damaged and inflamed by the awns from foxtail barley.

Foxtail barley can cause hardship in new residential developments for homeowners trying to establish newly seeded turf areas. The issue can continue until the turf (non-native grass species) is well-established and healthy enough to outcompete the native foxtail.

Some contributing factors that indicate a successful year for foxtail are the saline and alkaline soils and the seed bank that has been developing, resulting in high levels of viable seed in the soil that remain viable for up to 3 years. Drought conditions can stress established turf grass and allow the opportunistic foxtail to encroach.

In the 2021 season, the population density resulted in high service requests for foxtail barley. We will develop a monitoring program that can begin in early May. The monitoring precedes the seed maturity so we can make management decisions about mechanical removal before seed head development. With this monitoring program in place, we will be able to make population predictions and implement an effective management program depending on the service level standard chosen.

Step 2: Identification: What is the pest? Where does it grow?

Foxtail barley is a native grass that grows well in fields, pastures, ditches, roadsides, saline and alkaline areas, and other disturbed, often moist sites. It is found where water accumulates like seasonal pond areas, wet meadows and areas near ditches, streams, and stormwater retention sites. Often, foxtail can withstand drought conditions and grow in a wide variety of soils. Because it is a native species, it is adapted to thrive in the local environmental conditions.

The foxtail plant can grow to almost 2 feet (60 cm) tall. The flowering head is a spike that ranges from 1-1/5 to 4 inches (3–10 cm) in length. Seed production occurs from late May to August. The seed head often causes concern about possible harm to people and animals. Long needlelike awns, up to 1/3 inch (7 mm), extend from the spike, potential injury is due to the foxtail having tiny sharp barbs located along the outer edges of the awns.

Step 3: Know the Target Pest Biology: Will it be a long-term problem or will it be naturally managed in a short time?

Foxtail management will be an ongoing concern. Because this plant is a native perennial grass that reproduces by seed with a shallow fibrous root system, it can grow in any site with disturbed soils. The soil disturbance can be caused by development, environmental conditions and water level changes in water management locations.

Foxtail can become established in new developments before desirable species and will reoccur annually due to seed availability and environmental conditions. Elimination of this native grass species would not be an attainable goal. Environmental conditions beyond our control will always have an impact on foxtail distribution.

Step 4: Determine an Action Threshold: Do you need to act?

Action threshold can be determined as we develop the program. The action threshold can be a moving target based on service request numbers, population density and location.

Step 5: Select Management Plan: What is the best treatment?

There is no biological control available for foxtail.

Cultural controls are practices that prevent or reduce the establishment, reproduction, dispersal, and survival of the target pest. Proper cultural practices should promote the desirable species and can include soil amendments, planning design, turf seeding rates, and grass mixture selection. Establishing and maintaining healthy and vigorous turf grass through proper seeding rates and appropriate fertilization can increase germination success of the desirable grass species. Efficient irrigation and mowing schedules should keep the preferred species intensely competitive. Reducing soil disturbances in and around areas managed by the City of Lethbridge can help prevent the establishment of foxtail. Bare land held by developers is a contributing factor for seed availability. Proactive bylaw enforcement based on unsightly premises could be used to reduce foxtail in new developments.

Mechanical and physical controls can prevent seed distribution or remove the target pest from the environment. Seed survival is poor when buried greater than 3 inches for more than a year. Tillage is a viable control option in some select locations. Select tillage with a hoe can remove the root system from the area, and reduce viable seeds present. Re-seeding with desirable grass is needed with select tillage. Mowing can prevent seed head distribution and address safety concerns about human and animal interactions. Repeated mowing (similar to intensive grazing in an agricultural setting) may delay and reduce seed set, but mowing alone will not fully control foxtail barley populations over the long term.

Chemical control uses non-selective pesticides to prevent, reduce or eliminate the foxtail in some settings. The elimination is not permanent due to seed distribution and soil health factors. The targeted use of glyphosate can control foxtail in the spring and fall. Using glyphosate to manage perennial bunches and late germinating seedlings can be effective if followed by re-

seeding and fertilization. Application in spring is not the best option due to the higher rates of glyphosate needed to kill the actively growing plant. Fall application uses lower rates of chemicals because the plant is pulling food reserves into the root system and will translocate the chemical into the root system resulting in total plant mortality.

Chemical control can be done in non-turf locations. The pre-emergent chemical can be used to prevent seed germination. In 2021 pre-emergent applications were made with a residual product in the medians and some shrub bed locations within the City of Lethbridge. Pre-emergent products must be used according to label directions; this limits the areas the products can be utilized. When seasonal staff return, we can continue to make proactive pre-emergent applications. Strong communication is integral to success; a cohesive effort can allow the chemical product to maintain the barrier in the soil. If disturbances occur, a gap in the barrier can allow for seed germination. Follow-up spot application will be needed in situations where the barrier is broken.

Step 6: Evaluate: Did it work? What went well? What should change?

This aspect of the IPM program will continue throughout the process and yearly. Evaluating the program will allow changes when needed to strive for continual improvements and the most effective and efficient program possible.

If a service level increase is needed, we can develop a location-specific plan and implement a short-term (3 year) trial to determine the best action to take when making future integrated pest management decisions.

The financial impact of reducing foxtail barley can be high and ongoing. Total control is unrealistic and will never be achieved. If needed, we can make small service level changes; all that will come with additional costs, including equipment, labour and materials.