

INVASIVE PLANTS  
IN WISCONSIN

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**I**nvasive plants can thrive and aggressively spread beyond their natural range, disrupting ecosystems. The *Management of Invasive Plants in Wisconsin* series explains how to identify invasive plants and provides common management options. Management methods recommend specific timings for treatment, as well as expected effectiveness. For more information, go to: [fyi.uwex.edu/weedsci/category/invasive-plants-of-wisconsin](http://fyi.uwex.edu/weedsci/category/invasive-plants-of-wisconsin).

# Bird's-foot trefoil

## (*Lotus corniculatus*)

**B**ird's-foot trefoil is an herbaceous perennial legume. Stems are 2–3' long, slender, branching, square, and smooth to sparsely hairy. Because of its sprawling growth pattern, trefoil often smothers other plants that are less than 1' tall.

**Legal classification in Wisconsin:** Not regulated

**Leaves:** Palmately compound, alternate, smooth, or somewhat hairy. Consist of five leaflets, three leaflets at the end of each petiole and two stipules/leaflets attached where the petiole connects to stem (axil). Each leaflet is less than 0.66" long and 0.33" wide, roughly oval in shape with a rounded to pointed end, and tapering to the point where the leaflet attaches to the plant.

**Flowers:** Summer to early fall. Pea-like, 0.5" long, and light to dark yellow, occasionally with stripes of orange or red. Flowers are clustered in a whorl with 4–8 florets per whorl.

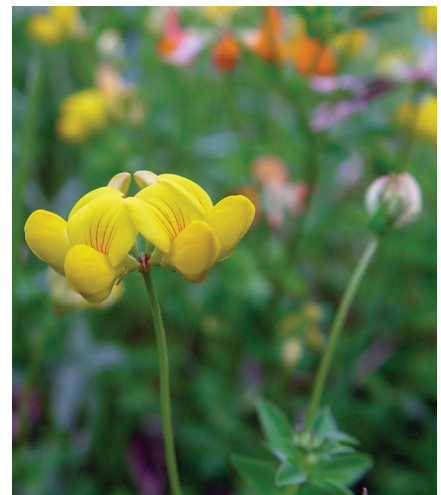
**Fruits and seeds:** Seeds contained in cylindrical brown pods (1–1.5" long) that become black upon maturity. Pods grow in clusters, averaging 5–6 pods per cluster. Clusters resemble a bird's foot. Seed pods contain 10–15 seeds and each seed is approximately 0.05" wide. Seeds are olive green to dark brown and often mottled with dark spots.

**Roots:** Taproot with lateral branches in the upper 1–2' of the soil that create a fibrous mat. All roots are perennial, and the lateral roots can produce new shoots.

**Similar species:** Distinguished from clovers and medics by its smooth leaf edges; other species have serrated leaf edges. Other legumes and plants with pea-like flowers are distinguished from trefoil by its compound leaves with five leaflets, prostrate growth habit, and yellow flowers.

**Ecological threat:**

- Invades open areas of varying soil types. Found spreading into natural areas from roadsides where it was planted for erosion control. Slow to establish, but once established, it is very persistent. New restoration plantings are especially susceptible to invasion by bird's-foot trefoil.
- Fixes nitrogen, which alters soil conditions for other plants.



## Non-chemical control

### Removal

**Effectiveness in season: 70–90%**  
**Season after treatment: < 50%**

If crowns and roots are removed, populations can be eliminated. This can be difficult, especially in heavy soils. A pitchfork or other tool can be used to loosen the soil around the plant to make removal easier. If only removing shoots, the frequency and length of removals necessary to reduce populations is not known, but likely many removals per year for several years will be necessary to reduce established populations. If flowers are present, bag material and dispose of it in a landfill or burn it to avoid potential for seed spread.

### Mowing

**Effectiveness in season: 90–100%**  
**Season after treatment: < 50%**

Repeated mowing to a height less than 2" at least once every three weeks during the growing season has been shown to suppress some populations. Repeating this procedure for multiple years can decrease stand cover, but will not eliminate populations.

### Prescribed burning

**Effectiveness in season: 50–70%**  
**Season after treatment: < 50%**

Late spring burns can kill germinating seedlings and can suppress above-ground growth of established plants, depending on fire intensity. After the fire, established plants will quickly resprout and reinvade areas, and the fire will promote seed germination and seedling establishment. This management method is not recommended unless being used to prepare the site for another treatment technique. A handheld propane torch can be effective for treating seedlings.

### Grazing

**Effectiveness in season: 50–70%**  
**Season after treatment: < 50%**

Bird's-foot trefoil is very palatable to a number of grazing animals. Trefoil tolerates grazing, but if heavily grazed, trefoil stands can be reduced. This typically results in invasion by other non-native species. If using grazing as a control method, the area should be over-seeded with desirable species, or grazing should be used as part of an integrated control program. Grazing can be an effective method to prepare a site for later herbicide application.

### Biological control

**Effectiveness in season: < 50%**  
**Season after treatment: < 50%**

Crown and root rots are the most significant diseases of bird's-foot trefoil. The trefoil seed chalcid (*Bruchophagus kolobovae* Fed.) is a small, black, wasp-like insect that can reduce seed production. To release biological control agents in Wisconsin, contact the Wisconsin Department of Agriculture, Transportation, and Consumer Protection for the required permit.

### Manipulation of the environment

**Effectiveness in season: < 50%**  
**Season after treatment: < 50%**

Bird's-foot trefoil is suppressed in highly fertile habitats. The addition of nitrogen can be detrimental to trefoil; however, additions of nitrogen can increase the competitive ability of invasive species as well as non-invasive species. Establishment and maintenance of vigorous species (e.g., *Solidago*) may effectively compete with establishing populations; however, once established, trefoil readily competes with most species.

## Chemical control

### Foliar

Apply directly to individual plants or broadcast across an infested area. Broadcasted foliar applications are typically the most cost-effective treatment in dense infestations. Use lower rates on smaller plants and less dense populations and higher rates on larger plants and denser populations. Absorption of herbicide can be limited with this species, resulting in reduced effectiveness. Including a recommended surfactant can alleviate any potential reduction in effectiveness.

**2,4-D\***

**Effectiveness in season: 70–90%**  
**Season after treatment: 50–70%**

**Common name:** Many

**Rate:**

**broadcast:** 2.0–4.0 lb a.e./A

**spot:** Equivalent to broadcast rates.

**Timing:** Apply in spring when plant is fully leafed out and actively growing.

**Caution:** Use aquatically labeled product if potential exists for solution to contact surface water. Use of this chemical in areas where soils are permeable, particularly where the water table is shallow, may result in groundwater contamination. Overspray or drift to desirable plants should be avoided since even minute quantities of the spray may cause severe injury to plants.

**aminopyralid\***

**Effectiveness in season: 90–100%**  
**Season after treatment: 70–90%**

**Common name:** Milestone

**Rate:**

**broadcast:** 7 fl oz/A (0.1 lb a.e./A)

**spot:** Equivalent to broadcast rates.

**Timing:** Apply in spring when plant is fully leafed out and actively growing.

**Remarks:** 14 fl oz/A can be used as long as less than half of the area is treated. Depending on the volume of solution applied per acre, typical mixtures for spot treatments are 2–8 mL Milestone per gallon of water.

**Caution:** Do not apply directly to water or to areas where surface water is present. Remains in soil for up to one year, depending on application rate. Overspray or drift to desirable plants should be avoided since even minute quantities of the spray may cause severe injury to plants. Do not compost treated plants since herbicide can persist through composting process.

**clopyralid\***

**Effectiveness in season: 70–90%**  
**Season after treatment: 50–70%**

**Common name:** Transline

**Rate:**

**broadcast:** 16–21 fl oz/A

(0.4–0.5 lb a.e./A)

**spot:** 0.4–0.75% (0.01–0.02 lb a.e./gal)

**Timing:** Apply in spring when plant is fully leafed out and actively growing.

**Caution:** Do not apply directly to water or to areas where surface water is present. Use of this chemical in areas where soils are permeable, particularly where the water table is shallow, may result in groundwater contamination. Remains in soil for up to one year, depending on application rate. Overspray or drift to desirable plants should be avoided since even minute quantities of the spray may cause severe injury to plants. Do not compost treated plants since herbicide can persist through composting process.

**dicamba\***

**Effectiveness in season: 70–90%**  
**Season after treatment: 50–70%**

**Common name:** Banvel

**Rate:**

**broadcast:** 16–32 fl oz/A

(0.5–1.0 lb a.e./A)

**spot:** Equivalent to broadcast rates.

**Timing:** Apply in spring when plant is fully leafed out and actively growing.

**Caution:** Do not apply directly to water or to areas where surface water is present. Use of this chemical in areas where soils are permeable, particularly where the water table is shallow, may result in groundwater contamination. Overspray or drift to desirable plants should be avoided since even minute quantities of the spray may cause severe injury to plants. Rates > 16oz/A (0.5 lb a.e./A) may cause stunting and discoloration of sensitive grasses, such as smooth brome.

**glyphosate\***

**Effectiveness in season: 90–100%**  
**Season after treatment: 70–90%**

**Common name:** Roundup

**Rate:**

**broadcast:** 1.5–3.0 lb a.e./A

**spot:** For a 3 lb a.e./gal product. 1–2% (0.03–0.06 lb a.e./gal)

**Timing:** Apply in spring when plant is fully leafed out and actively growing.

**Caution:** Use product labeled for aquatic use if potential exists for solution to contact surface waters. Applications can result in bare ground since glyphosate is not selective. Overspray or drift to desirable plants should be avoided since even minute quantities of the spray may cause severe injury to plants.

**metsulfuron\***

**Effectiveness in season: 70–90%**  
**Season after treatment: 50–70%**

**Common name:** Escort

**Rate:**

**broadcast:** 0.5–1.0 oz/A

(0.3–0.6 oz a.i./A)

**spot:** 0.04 oz/gal (0.03 oz a.i./gal)

**Timing:** Apply in spring when plant is fully leafed out and actively growing.

**Caution:** Do not apply directly to water or to areas where surface water is present. Remains in the soil for months, depending on application rate. Overspray or drift to desirable plants should be avoided since even minute quantities of the spray may cause severe injury to plants.



Herbicide information is based on label rates and reports by researchers and land managers. Products known to provide effective control or in common use are included. Those that do not provide sufficient control or lack information for effectiveness on target species have been omitted.

References to pesticide products in this publication are for your convenience and not an endorsement of one product instead of a similar product. You are responsible for using pesticides in accordance with the label directions. *Read the label before any application.*

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