

CROWNVETCH, SWEETCLOVER, AND BIRDSFOOT TREFOIL CONTROL

FNR-651-W



Non-native Legumes such as crownvetch (*Securigera varia*; pictured above), yellow and white sweetclover (*Melilotus officinalis* and *M. albus*), and birdsfoot trefoil (*Lotus corniculatus*) can invade grasslands, old fields, and conservation plantings (e.g., CRP plantings). These species can reduce the habitat quality of conservation plantings by outcompeting native plants, reducing plant diversity, and, in some cases, restricting wildlife movement and foraging.

Do's

- Use mowing or prescribed fire as a site preparation technique.
- Use hand-pulling for small infestations.
- Apply recommended herbicides to control these species.
- Prioritize herbicide applications when warm-season native plants are not actively growing (spring or late fall).

Don'ts

- Mow the entire field during the growing season when wildlife is a priority.
- Use mowing or prescribed fire alone.
- Use broadcast herbicide applications in areas with desirable non-target forbs.
- Interseed or reseed native seeds immediately following an application of aminopyralid or clopyralid.

Crownvetch and birdsfoot trefoil are cool-season perennials, which start growing in early spring, flower from May to August, and end growth late in the fall. Sweetclovers are cool-season biennials and start as vegetative growth in their first year, growing from March to October. Sweetclovers flower from May to October in their second year, producing large volumes of seeds.

Control Options

The best control method for these species is often herbicide application, especially if they are widespread across the site. However, other control options exist and can be effective when integrated with herbicide treatments.

Hand-pulling

Small crownvetch, sweetclover, and birdsfoot trefoil infestations can be hand-pulled or dug from the ground using a hand spade. The entire plant should be removed and disposed of off-site, including the stems, roots, and rhizomes.

Mowing

Mowing infestations repeatedly during the growing season for multiple years can help reduce these species' abundance. However, infrequent mowing, such as only once, can worsen the infestations of species such as birdsfoot trefoil. If mowing is used during the growing season, spot mowing should target only those areas where these species are the most prevalent, as mowing may conflict with wildlife nesting. Mowing sweetclover as short as possible once during its second year of growth – before or just after flowering, but before seed production (approximately May) – can effectively control sweetclover. Mowing during the spring can also be used as a site preparation technique to enhance the effectiveness of herbicides.

Prescribed Fire

Multiple years of prescribed fire during late spring (May) can be effective at stopping seed production and reducing sweetclover during its second year of growth. Crownvetch and birdsfoot trefoil can be suppressed, and their spread slowed with late spring prescribed fire. However, because these species can re-establish from seeds in the seed bank following a fire, prescribed fire alone is not an effective long-term control strategy. Prescribed fire during the dormant season (Nov-Mar) or spring can be used effectively as a site preparation tool for follow-up herbicide application.

Herbicide

Herbicides containing the active ingredients 2,4-D, aminopyralid, chlorosulfuron, clopyralid, glyphosate, and triclopyr can provide control – depending on the species. Aminopyralid and clopyralid provide effective control of all four species. Herbicide applications to control these species can damage non-target forbs, but many native grasses are tolerant to aminopyralid or clopyralid. Residual herbicide in the soil after a clopyralid or aminopyralid treatment may reduce native forb

seedling emergence for a period post-treatment. Therefore, reseeding or interseeding should be done at least 90 days after an application. To limit damage to non-target plants, these species should be targeted in the spring before many native plants are growing or in the fall after many native plants are dormant. Spot-spray applications should be used in areas with low infestations or high native plant diversity.

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Additional Resources

Jorgensen N.A., M.J. Moechnig, M.B. Halstvedt, and M.J. Renz. 2017. Native forb establishment following application of aminopyralid or clopyralid. *Invasive Plant Science and Management*. 10(1):90-98.

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Conservation Program Disclaimer: *The management practices in this publication may conflict with cost-share program (e.g., CRP) rules and regulations (e.g., primary nesting season). If you are enrolled in a conservation program, please consult with an agency representative before utilizing a prescribed practice.*

Control Scenarios

These scenarios are only a few examples of common scenarios in the field. Many other scenarios exist. For your specific conditions, please consult a biologist.

Native grassland with high native forb diversity and/or low infestation of sweetclover.

OPTION 1. FIRE + HERBICIDE	OPTION 2. MOWING + HERBICIDE
Year 1 <ul style="list-style-type: none"> Use prescribed fire during late spring (May) Spot spray surviving plants with recommended herbicide during the summer (before flowering) or fall (first-year plants only)* Year 2 <ul style="list-style-type: none"> Spot spray second-year plants before they flower (~Jun)* Spot spray first-year plants during fall (Sep-early Nov)* Year 3+ <ul style="list-style-type: none"> Use prescribed fire (late spring or late summer) as necessary Spot spray first-year plants in the spring or fall or second-year plants before they flower (~Jun)* 	Year 1 <ul style="list-style-type: none"> Spot mow areas with first-year or second-year plants before or during early flowering (~May) but before seed production. Spot spray plants with recommended herbicide during summer or fall* Year 2 <ul style="list-style-type: none"> Spot mow areas with first-year or second-year plants before or during early flowering (~May) before seed production. Spot spray plants during summer or fall* Year 3+ <ul style="list-style-type: none"> Spot mow areas with first-year or second-year plants before or during early flowering (~May) but before seed production. Spot spray plants during summer or fall*

Old field, native grass pasture, or CRP field with low native forb diversity and heavy crownvetch infestation.

OPTION 1. FIRE OR MOWING + HERBICIDE	OPTION 2. FIRE OR MOWING + HERBICIDE
Year 1 <ul style="list-style-type: none"> Prepare the site with a dormant season prescribed fire or spring mow (Apr-May) Broadcast or spot spray crownvetch in May-June before flowering with recommended herbicide* Spot-spray remaining crownvetch during fall (Sep-early Nov) when most native plants are dormant* Year 2+ <ul style="list-style-type: none"> Spot spray any remaining crownvetch during spring (Apr-May) before most native plants emerge* Spot-spray any remaining crownvetch during fall (Sep-early Nov) after most native plants are dormant* Use prescribed fire as needed 	Year 1 <ul style="list-style-type: none"> Prepare the site by mowing or burning during the fall (Sep-Oct) Broadcast or spot-spray crownvetch with recommended herbicide at least 2-3 weeks after mowing or burn* Year 2+ <ul style="list-style-type: none"> Spot spray any remaining crownvetch during spring (Apr-May) before most native plants emerge* Spot-spray any remaining crownvetch during fall (Sep-early Nov) after most native plants are dormant*

*Note: if planning to reseed or interseed with native forbs following the initial treatment, consider using non-soil active herbicides such as triclopyr for follow-up treatments.

Control Timeline

CONTROL OPTION	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Hand-pulling												
Mowing ¹												
Prescribed Fire												
Herbicide												

 Control²

 Suppression³

 Site Preparation⁴

¹ Suppression from mowing will take several mowings in a single growing season for perennial species.

² Control = provides effective control

³ Suppression = reduces sericea vigor, dominance, or seed production but may not provide long-term control

⁴ Site preparation = used before herbicide application to improve herbicide efficiency

Herbicide Recommendations

Active Ingredient	Trade Names ¹	Application rates ²	Application Timing	Adjuvant Information ³	Additional Information
2,4-D	2,4-D Amine, Havoc, Pasture Pro	Broadcast: 2-4 pt/ac (2,4-D amine) ² Spot Spray: equivalent to broadcast rate	Apply when plants are actively growing and after full leaf expansion. Use higher rates for larger plants	Adjuvants are not needed when using ester formulations. If amine formulations are used, adding a COC at 1% v/v can be helpful.	Broadleaf selective herbicide. Will kill or damage other broadleaf plants (forbs) it contacts.
aminopyralid	Milestone	Broadcast: 5-7 oz/ac Spot Spray: equivalent to broadcast rate	Apply when plants are actively growing and after full leaf expansion. Use higher rates for larger plants. For crownvetch and sweetclover control, apply before bloom.	Addition of NIS (0.25-0.5% v/v) is recommended to improve efficacy on tough-to-control weeds.	Broad-spectrum selective herbicide. It will kill or damage various broadleaf plants (forbs) and some grasses it contacts. Many native grasses are tolerant to application. Does have soil residual activity.
aminopyralid + 2,4-D	GrazonNext HL	Broadcast: 1.2-1.5 pt/ac Spot Spray: 0.6-2.9 oz/ 3 gallons of water (depending on gallons per acre of solution applied)	Apply when plants are actively growing and after full leaf expansion. Use higher rates for larger plants	Adding NIS (0.25-0.5% v/v) is recommended to improve efficacy on tough-to-control weeds.	Broad-spectrum selective herbicide. Control of crown vetch and sweetclover is listed on the label. Does have soil residual activity.
aminopyralid + florypyrauxifen-benzyl	DuraCor	Broadcast: 12-20 oz/ac Spot Spray: 0.1-3 oz per 3 gallons of water (depending on gallons per acre of solution applied)	Apply when plants are actively growing and after full leaf expansion. Use higher rates for larger plants	The addition of a high-quality MSO at 1% v/v or NIS (of at least 80% active ingredient) at 0.25 to 0.5% v/v is allowed to enhance herbicide activity under adverse environmental conditions (such as high temperature, low relative humidity, drought conditions, dusty plant surfaces) or when weeds are heavily pubescent or more mature.	Broad-spectrum selective herbicide. Will kill or damage most forbs it contacts. Does have soil residual activity.
aminopyralid + metsulfuron methyl	Chaparral, Opensight	Broadcast: 1.5-3.3 oz/ac Spot Spray: equivalent to broadcast rate	Apply when plants are actively growing and after full leaf expansion. Use higher rates for larger plants	Apply with COC/MSO (1% v/v) or NIS (0.25%). AMS (2 lb/A) or UAN (2 qts/A) can also be added for tough weeds.	Broad-spectrum selective herbicide. Will kill or damage many forbs it contacts. Many established native grasses are tolerant. It can suppress some grasses such as smooth brome. Does have soil residual activity.
cholorsulfuron	Telar XP	Broadcast: 0.5-1 oz/ac Spot Spray: 0.04 oz/gal	Apply when plants are actively growing and after full leaf expansion. Use higher rates for larger plants	A high-quality spray adjuvant should be added at the manufacturer's specified use rate. Do not use LI-700 or any acidifying spray adjuvants with TELAR*XP.	Broadleaf selective herbicide. It will kill or damage various broadleaf plants (forbs) it contacts. Many native grasses are tolerant at specific application rates. Does have soil residual activity.
clopyralid	Transline, Stinger	Broadcast: 1-1.33 pt/ac (Stinger) Spot Spray: 3/8-1/2 oz per gallon of water (Stinger)	Apply when plants are actively growing and after full leaf expansion. Use higher rates for larger plants.	Transline - To control broadleaf weeds with broadcast applications, use a NIS at 1 to 2 qt per 100 gallons of spray solution. Stinger - Adjuvants are not usually needed when applying Stinger, but a surfactant can increase the effectiveness of the herbicide. However, it may also make non-target plants or crops more susceptible to injury.	Broadleaf selective herbicide. Will kill or damage other broadleaf plants (forbs) it contacts. Does have soil residual activity.
glyphosate	Roundup, Gly Star Plus, and others	Broadcast: 1-3 qt/ac (Mad Dog Plus) Spot Spray: 1-2% solution	Apply when plants are actively growing and after full leaf expansion. Use higher rates for larger plants	Add AMS (2-3 lbs/A). Add NIS to improve control of tough-to-control species of the formulation that does not contain a spray adjuvant.	Broad-spectrum herbicide. Will kill or damage most plants (forbs or grasses) it contacts. Not soil active.
metsulfuron methyl	Escort XP	Broadcast: 0.3-1 oz/ac Spot Spray: 0.04 oz/gal	Apply when plants are actively growing and after full leaf expansion. Use higher rates for larger plants	Apply with NIS at a minimum rate (concentration) of 0.25% v/v (1qt/100 gal of spray solution)	Broad-spectrum selective herbicide. Many native grasses are tolerant to application. Does have soil residual activity.
sulfometuron methyl	Oust XP	Broadcast: 3-5 oz/ac Spot Spray: equivalent to broadcast rate	Apply when plants are actively growing and after full leaf expansion. Use higher rates for larger plants	Apply with NIS (1 qt/100 gal).	Broad-spectrum selective herbicide. Will kill or damage a variety of forbs and grasses it contacts. Does have soil residual activity.

¹ Product names are provided as examples and for educational purposes. Several other products with the same active ingredient may exist. Listing of the products does not constitute an endorsement.

² The rates for these applications are provided for one specific product as an example. Treatments and recommended application rates are based on the herbicide labels, relevant research, and the publications Management of Invasive Plants in Wisconsin: Sweetclovers and Crown-vetch from the University of Wisconsin Cooperative Extension. View the herbicide labels to verify rates before use.

³ Spray adjuvants, including surfactants, are supplemental products added to a spray mixture to improve the performance of the chemical. Please refer to the product labels for more information. AMS = ammonium sulfate, COC = Crop Oil Concentrate, MSO = Methylated Seed Oil, NIS = Nonionic Surfactant, v/v = volume/volume.

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