

# DYER'S WOAD

*Isatis tinctoria*

## CONTROL

### Hand Pulling

Repeated hand pulling treatments have been very effective in managing infestations of dyer's woad in Montana. First treatment should occur when infestation is close to full bloom, with a second treatment occurring three to four weeks later to catch any individuals that were missed the first time or re-sprouted. The root crown and most of the taproot must be removed in order for hand pulling to be effective. All flowering plants must be placed in plastic bags and removed from the site, either for burning or waste to landfill. Pulling is most successful when soil is moist.

### Mowing

Mowing has the potential to be an effective method of control if done when plants have begun to form seed pods, but prior to the plant forming more than 75% of its seed pods.

### Cultivation

Tillage works to reduce populations in crop fields. Seedlings must undergo a cold period before emergence and maturity. Herbicides in combination with tillage can remove late, emerging plants. Crop rotation, tillage, and herbicide can be used for infested alfalfa fields.

### Biological control

N/A

### Ideal Timing for Treatment Options

| Winter                      | Spring | Summer              | Fall   |
|-----------------------------|--------|---------------------|--------|
| Manual Removal (bag & burn) |        |                     |        |
|                             |        | Foliar              | Foliar |
| Mowing + Herbicide          |        |                     |        |
|                             |        | Tillage + Herbicide |        |

### Grazing

Grazing is not an effective method of control for dyer's woad because the intensity of grazing required tends to do more damage to competitive desirable plant species than to the dyer's woad infestation.

### Herbicide

There are a number of effective herbicides for dyer's woad. The ultimate goal of all herbicide application is to prevent Dyer's woad from going to seed. Therefore, herbicide treatments should occur in rosette to bolt stage, although plants that have begun to flower can be cut and the basal leaves sprayed. The following herbicides are recommended for control of dyer's woad. Always consult product labels and read them carefully to ensure correct species/land management usage and chemical application.



## Dyer's Woad Life Cycle

| Life Cycle                                       | Root                           | Leaves  | Stems                       | Flower  | Seed/Fruit   |
|--|--------------------------------|---|-----------------------------|---|--|
| Winter annual, biennial or short-lived perennial | Taproot and some lateral roots | Bluish-green with white midrib. Rosette leaves have long slender stalks, are widest near the tip and covered with soft hairs. Stem leaves lack hairs, are alternate, lance-shaped, and clasp the stem. Rubbery texture. | 1 to 4 feet tall, branching | Yellow, 4 petals, 1/8 inch long and wide. Form flat-topped cluster at top of stem | Purplish-brown when ripe, teardrop-shaped and dangle from small stalks |

## Herbicides for Dyer's Woad, *Isatis tinctoria*

| Active Ingredient                | Rate                            | Efficacy   | Comments   |
|----------------------------------|---------------------------------|--|--|
| Metsulfuron                      | 0.75 oz/acre                    | Rosette to bud stages with a non-ionic surfactant  | *addition of 2-4,D at 3 pints/acre to solution will improve effectiveness<br>Do no use near wells, surface water, or shallow ground water. |
| Chlorosulfuron                   | 1 oz/acre                       | Rosette to bud stages with a non-ionic surfactant  | *addition of 2-4,D at 3 pints/acre to solution will improve effectiveness  |
| 2,4-D                            | 3 pints/acre                    | Rosette stage most effective, will not prevent seed production when sprayed onto flowering plants. | Not the most effective listed. Better when combined with Metsulfuron or Chlorosulfuron (refer above).                                      |
| Imazapic + (Methylated Seed Oil) | 8-12 oz/acre + (Oil: 1 qt/acre) | Rosettes to bud stages.  | Flowering stalks can also be removed manually (and bagged or burned); their rosettes and stems can then be herbicided.                     |

Information on diagnostic identifying characteristics adapted from "Montana's Noxious Weeds" by Pokorny and Mangold, Montana State University Extension Bulletin EB0159.