A prickly situation: How to recognize and manage yellow starthistle

Yellow starthistle (*Centaurea solstitialis*). Photo by Matt Lavin, Montana State University, Bozeman.

Adorned with protruding toothpick-like spines, the yellow starthistle is an invasive and unwelcome newcomer to any pasture or backyard. This prickly weed is thought to have arrived in the United States in the mid-19th century with contaminated alfalfa seed. Since then, it has invaded the Northern Sierra Nevada mountains and the western slope of the Rocky Mountains, infesting millions of acres in California, Washington, Oregon, Idaho, and Utah.

In Wyoming, land managers and technicians have successfully kept the scourge at bay by periodically identifying and treating isolated introductions. Successful eradication can be credited to quick action, the use of multiple control strategies, and efforts to find any satellite patches or plants escaping control. Education has also proved to be an effective tool in controlling outbreaks, making it easier for landowners to identify and treat occurrences early and economically.

A prolific invader

Outside its home range in the Mediterranean, yellow starthistle lacks naturally present enemies such as insects and diseases. When introduced to a new environment, this prolific seed producer quickly forms a dense monoculture that is decidedly unpalatable to livestock and wildlife. The weed also outcompetes native plants for nutrients, primarily in disturbed areas where growing conditions are already difficult for native perennials and desirable species.

Identification

Yellow starthistle is a striking, conspicuous plant when observed as a specimen in a plant collection or online. However, very few of the plants in a small, mostly immature infestation look anything like the pictures, especially early on in the invasion process. Prior to flowering, the seedlings look similar to a small sagebrush plant, particularly in their gray-green color. The spiked flower is devoid of any yellow hue and the spikes, if present, are soft and bunched together in a single non-descript point. This means an infestation may be significantly more widespread than it initially appears.

Recently, a small occurrence of yellow starthistle was found in Natrona County. Most of the plants discovered at this site did not look like the brightly colored images that abound online and in reference books. Only an estimated 5 to 10 percent of the plants at the site were large and conspicuous, complete with flowers. The remainder were in various stages of immaturity or were mature but small, making it very difficult for the untrained eye to identify them at any distance.

Life cycle

Yellow starthistle reproduces only by seed, following the life cycle of a winter annual and, occasionally, a biennial (living for two growing seasons). Winter annuals are perfectly positioned to exploit the scarce resources in many of Wyoming's ecotypes. Weeds with similar competitive characteristics include cheatgrass, medusahead, and ventenata.

Yellow starthistle begins growing with late summer or fall precipitation, when native bunch grasses are dry and struggling to recover from summer heat and herbivory. The weed overwinters as an immature plant, complete with an intact root system, which means it is ready to utilize springtime moisture before the desirable plants.

Yellow starthistle produces two types of seed, one with bristles and the other mostly smooth. The two different types of seed provide multiple dispersal mechanisms for the weed to spread. The smooth seeds are easily spread through the digestive systems of animals such as birds. The parachute-like bristles of the other type of seed can catch the Wyoming wind or an animal's fur, moving the plant to new areas. The seed can also move large distances via transportation in dirt attached to vehicles or contaminated products. A successful control program must prevent seed formation and movement.

If you find yellow starthistle on your property, notify your local weed and pest district office. They can help you create a plan to eradicate this noxious weed, and possibly assist with implementing control measures.

Control strategies

Chemical

Luckily, many herbicides can be used to control yellow starthistle. Mixing herbicides from multiple modes of action is the most effective approach to chemical control. On most rangeland sites, a combination of active ingredients, including aminopyralid (Milestone) and metsulfuron (MSM or Escort) is an effective option. As always, consult product labeling before making an application.

Mechanical

Hand pulling is also effective, especially against plants that may have already produced mature flowers and seeds. Simply pluck the shallow-rooted plant and place it in a trash bag to secure it. Dispose of it by burning or in the landfill. Mowing can be used to target immature plants prior to seed formation, but is most effective when used in combination with an herbicide application.

Physical

In addition to chemical and mechanical control, exclusion fencing is recommended to reduce both wild and domestic animals from moving seed around.

In situ image of many yellow starthistle plants. Photo by Matt Jolivet.

Wash stations

To prevent the weed from spreading, managers must also ensure that seeds do not move out of the site of infestation. Mud and dirt can contain large amounts of small seeds that are easily spread by animal, human, or vehicle movement.

For isolated infestations of seed-producing weeds, including yellow starthistle, a wash station for vehicles operating near invaded sites may be appropriate. To construct a wash station, dig out a shallow area large enough for the types of vehicles that need to be washed. Place water-permeable geocloth fabric inside the dug-out area and secure with landscape staples.

Weed-free stone aggregate placed on top of the cloth reduces compaction and supports vehicles while allowing water to drain. Mud and seeds washed from the vehicles can be disposed of with the geocloth and aggregate once the need for the weed wash station is eliminated or the aggregate is filled with mud.

Keep watch

Finally, and most importantly, successful control requires thorough and continuous observation of the site and areas around the infestation. The seed longevity of yellow starthistle is approximately 10 years in the soil. The infestation site must be evaluated and kept free from any successfully reproducing plants for that period to be considered free of the pestilence.

Matt Jolivet is supervisor of the Natrona County Weed and Pest District. All of the control strategies mentioned in this article have been utilized for the control of the infestation in Natrona County with the goal of eradicating yellow starthistle. Questions or weed sightings in Natrona County can be addressed to ncwpoffice@gmail.com.