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Fact Sheet-03-54

Managing Perennial Sowthistle

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Perennial sowthistle (*Sonchus arvensis* L.) is a native of Europe or Eurasia. Introduced to North America by the transport of contaminated crops, it is now widely distributed across the northern half of the United States, including northern Nevada. It spreads by seed and creeping roots, and is capable of growing in a wide range of environmental conditions and habitats.

Identification

Perennial sowthistle is a member of the Asteraceae (sunflower) family that can grow up to 6 feet tall, but usually only reaches 2 to 4 feet. The dull green stems are unbranched and smooth on the lower part of the plant, but branched and furrowed on the upper part. They exude a milky sap when broken or crushed. The shiny green leaves grow alternately along the stems. Each has a base that clasps (grows around) the stem, a slightly prickled margin, and may vary from deeply toothed to nearly smooth margin. The lower leaves have deeply cut side lobes that point backwards. The upper leaves are smaller and fewer.

The yellow-orange flowers are 1 to 2 inches wide, and resemble dandelions. The flower stalks and bracts at the base of the flower have numerous gland-tipped hairs that help differentiate perennial sowthistle from other species (Fig. 1). The 1/8-inch long seeds are dark reddish-brown, notably ridged and wrinkled, with a soft white tuft (pappus) of many fine, barbed hairs.

Perennial sowthistle has thickened horizontal rhizomes that spread rapidly, 2 to 4 inches below the surface of the ground. Numerous buds develop on the rhizomes at irregular intervals. Pieces of rhizome as small as 1/4 inch can produce a flowering plant. The leaves and stems die over winter and new shoots are



Figure 1. The stalks and bracts of the yellow flowers are covered with gland-tipped hairs (top). New shoots surface from lateral roots (below).

produced each spring from buds on the crown and rhizomes (Fig. 1). The roots of perennial sowthistle can grow to a depth of 10 feet, which makes this plant aggressive and difficult to control.

Marsh sowthistle (*S. uliginosus*) is similar to perennial sowthistle, but lacks gland-tipped hairs. Several annual sowthistles are found across the west. They usually have longer, stouter spines on their stems and leaf margins, and of course, they do not reproduce from rhizomes.

Habitat

Perennial sowthistle can tolerate variable environments, and adapts well to wet sites with

little soil disturbance. Consequently, perennial sowthistle survives in many different habitats.

Perennial sowthistle is common in gardens, cultivated crops, ditchbanks, and fertile waste areas throughout northern Nevada where sufficient soil moisture is available. It flourishes on heavy, moist soils, but is frequently found in poorly drained soils and soils capable of holding a lot of water. High soil moisture gives perennial sowthistle a competitive advantage, however, once established it tolerates low soil moisture and resumes active growth when precipitation occurs.

Impact

Perennial sowthistle can be a serious problem on rangelands, pastures, wastelands, roadsides, cultivated fields, canals, salt and brackish marshes, and disturbed habitats. It can displace native plant communities by invading disturbed sites and undisturbed natural habitats. Perennial sowthistle can also affect the quality of crops by slowing drying times during hay harvest or contaminating seed products. The green matter from perennial sowthistle contamination in grain increases drying time, seed cleaning costs, and reduces the value of the seed. Light infestations of perennial sowthistle can cause yield losses in field crops, horticulture crops, and forages.

Perennial sowthistle also has some positive uses. Historically it was eaten to treat fevers, skin disorders, acid stomach, disorders of the intestinal tract, heart palpitations, and anemia. The milky juice from the stem and leaves can be applied to sunburns, and eating the roots has been prescribed for jaundice.

Weed Management Options

Prevention: The hairs on seeds (pappus) of perennial sowthistle facilitate its spread to great distances. The seeds germinate rapidly and seedlings can grow into mature plants a few weeks after emergence. The seedlings are easily controlled through mechanical and chemical methods, so early detection and treatment are very important. Planting weed-free crop seed and controlling weeds on field borders can prevent the spread of perennial sowthistle.

Monitor both private and public lands for perennial sowthistle annually. Eliminate it when found and then revisit the site each year to ensure there are no escapes. Before leaving an



Figure 2. Mature plants grow 2 to 4 feet tall.

infested area, check for seeds on your clothing, shoes, animals, equipment, and vehicles.

Mechanical Control: Tillage effectively kills seedlings, but is ineffective thereafter; it simply breaks the roots and causes new shoot growth from the pieces. However, cultivation every 3 to 4 weeks continuously drains the root reserves, and the plants eventually die. The root reserves are decreased more by spring cultivation than at later growth stages. Fallowing for a year beginning in the fall and cultivating every 3 weeks in the spring reduces perennial sowthistle stands considerably. A combination of thorough cultivation and chemical application is more practical, though, because of the costs associated with cultivation.

Mowing before flowers have been open a week prevents seed production, thus reducing the spread of sowthistles by seed. Regrowth will occur, thus mowing multiple times is required to control stem growth and prevent flowering and seed production. Mowing may stimulate sprouting of new plants from the rhizomes, thus creating a denser stand of sowthistle.

Burning the plant has little effect on the roots and rhizomes, but will kill the top growth. When

moisture becomes available the sowthistle will regrow from the root system.

Cultural Control: An alfalfa or alfalfa-grass mixture, regularly cut for hay, can eliminate most perennial sowthistle plants in 3 years. Perennial sowthistle can compete strongly with alfalfa, but regular mowing changes the competitive relationship in favor of alfalfa.

Grazing cattle or sheep can effectively contain infestations in pastures. Perennial sowthistle is excellent feed, and intensive grazing will weaken the plants and enhance other control practices. Livestock will eat the new growth of sowthistle and occasionally its roots, reducing its competitive potential.

Biological Control: Six species of insects that feed only on sowthistles have been found and released for their biological control. Five of these species reduce seed production by feeding on developing tissue within the seed head, with *Tephritis dilacerata* being the most promising. Released in Canada, this fly forms galls on the flower heads to limit seed production. The effectiveness of these predators to reduce the perennial sowthistle population is variable and very dependant upon the environment of the site.

Cystiphora sonchi forms galls on vegetative parts of the plants. Since its introduction in Canada, no significant weed reductions have been observed. There are a limited number of pathogens that look as though they are specific to sowthistle in North America.

Perennial sowthistle is vulnerable to several species of nematode. The root-knot nematode *Meloidogyne incognita*, the cyst-forming nematode *Heterodera sonchophila*, and the lesion-forming nematode *Pratylenchus penetrans* are among these. *P. penetrans* is capable of causing disease to vegetable crops, ornamentals, and small fruits, but *H. sonchophila* is more specialized and has been reported as very pathogenic to perennial sowthistle seedlings in some areas.

Several fungi, viruses, and bacteria can also effectively control perennial sowthistle. Many of these, however, will also cause disease in valuable crops. *Marssonina sonchi*, *Septoria sonchi-arvensis*, and *Septoria sonchifolia* are all fungi species that appear to be specific to perennial sowthistle in Canada.

Chemical Control: When mechanical methods cannot be utilized, herbicides are the

most effective method of controlling perennial sowthistle. Chemical control can be achieved by using 2,4-D, clopyralid, dicamba, glyphosate, and picloram. Applications should be made at the pre-bud or bud stage. Use the highest recommended herbicide rates on the label to destroy the underground roots of established plants. Lower or medium rates will kill seedlings, but may only kill the aboveground parts of mature plants, and new plants will emerge soon after from the roots.

Applying herbicides several times during the same growing season may enhance control. Early and late applications of 2,4-D and dicamba will control perennial sowthistle a year after application. Reapplying the same herbicides the second year will maintain control. Fall treatment of the rosettes appears to be more successful than treatments earlier in the year. Chemical control is difficult because the plant lacks susceptibility to many products.

Conclusion

Through seeds and creeping roots, perennial sowthistle is rapidly spreading throughout the United States and Nevada. As with all invasive weeds, prevention is the cheapest and easiest way to control this plant. Identification of weeds is important because early detection makes eradication possible and control cheaper. Mechanical methods can be performed on small infestations, but must be done carefully because of the extensive root system. If all else fails, herbicides can be applied to large infestations to obtain control of this noxious weed. Follow-up spot treatments with herbicides are usually necessary for several years after most treatments to control perennial sowthistle.

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