

PNW0350



PURPLE STARTHISTLE

(*Centaurea calcitrapa* L.) and

IBERIAN STARTHISTLE

(*Centaurea iberica* Trev. ex Sprengel)

Purple and Iberian starthistles are noxious weeds that may infest range, pasture, and roadsides in the Pacific Northwest. As with other knapweeds and starthistles, these species are unpalatable and may replace valuable forage species. Dense infestations of these rigidly branched plants armed with long hard sharp spines make infested areas inaccessible. Grazing animals generally avoid purple starthistle, but may eat the young rosettes if other feed is not available. The sharp spines also deter people who use recreation areas. When these exotic species invade natural areas and parks, they degrade areas of native vegetation.

Purple starthistle is native to the Mediterranean region, southern Europe and northern Africa. Iberian starthistle is native to Asia Minor in the region between the Caspian and Black seas.

Identification

Purple starthistle

Mature plants are 1 to 4 feet tall, have a stout taproot, and are densely and rigidly branched. Young stems and leaves are covered with cobwebby hairs but usually become almost smooth with age. Lower leaves are deeply divided into oblong-linear segments; upper leaves are narrow and undivided and do not form a wing down the stem like that of yellow starthistle. The undersides of leaves are sparsely pitted with minute clear globules. Rosette leaves are deeply lobed and older rosettes have a circle of spines in the center.

Flower heads, 3/4 to 1 inch long, are numerous. Flowers vary from lavender to deep purple. Marginal flowers are not enlarged. The bracts of the flower head are tipped with a stout rigid straw-colored spine about an inch long, with one to three pairs of lateral prickles near its base. The scientific name, *calcitrapa*, is derived from the word

caltrop, a weapon with protruding spikes once used to obstruct the passage of cavalry.

The seed (achene) is about 1/8 inch long and has no bristles. It is straw-colored and mottled with dark brown.

The sharp spines of purple starthistle present a formidable barrier to recreationists and grazing animals.

Photo by Dave Pratt.



Purple starthistle flower head. Marginal flowers are not enlarged. Rigid spines are about 1 inch long.

Photo by Cindy Roché.

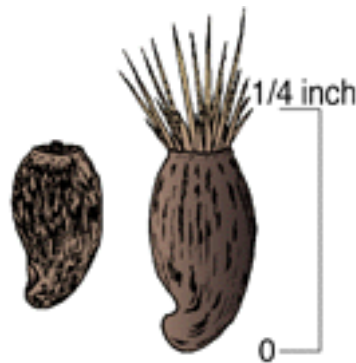


Iberian starthistle

Iberian starthistle is very similar to purple starthistle. Mature seed heads are needed to positively identify the species. Seeds of Iberian starthistle have a plume consisting of a few to numerous flattened bristles about half as long as the seed. Flowers of Iberian starthistle tend to be a lighter purple. The head is generally more globular than that of purple starthistle.

Plumeless seed of purple starthistle (left) and plumed seed of Iberian starthistle (right).

Illustration by Cindy Roché.



Biology and Ecology

Purple and Iberian starthistles are biennials and reproduce by seed. Under some conditions they may behave as annuals or short-lived perennials. The first year each grows as a rosette followed by flowering and seed production the second year. The biennial to perennial life cycle gives these species a competitive advantage over annual rangeland species. Purple starthistle is a major problem on annual rangelands in the San Francisco Bay area in California. It is more prolific on fertile sites. In the Bay area purple starthistle grows on the heavier bottomland soils; yellow starthistle thrives on adjacent hillsides.

Iberian starthistle is slated for eradication in California. Infestations occur along streambeds or other wet areas. It has moved along stream courses in Lake, Napa, Mariposa and Amador counties.

Both species disperse by seed over long distances.



Purple starthistle rosette. Leaves are deeply lobed with light colored midribs. Spines develop in the center of the rosette of leaves.

Photo by Cindy Roché.



Purple starthistle dominates some annual rangelands in the San Francisco Bay Area, California.

Photo by Dave Pratt.



Mechanical injury can result when grazing animals are forced to feed in or around purple starthistle.

Photo by Dave Pratt.

Control

The level of control required by law in Washington is eradication. The known distribution of purple starthistle in Washington is limited to two populations, one each in Asotin and Island counties. Iberian starthistle has not been reported since 1929 when it was collected near Ellensburg. In Oregon, Iberian and purple starthistle both appeared in Jackson County. A population of Iberian starthistle near Medford in the mid-1950s apparently has not persisted. A population of purple starthistle growing near Jacksonville in the mid-1980s has been eradicated. Neither species has been reported in Idaho.

Prevention

Prevent new starthistles from becoming established. Identify them and take prompt action while infestations are still small. Check hay, seed, equipment, livestock and other potential sources of entry for weed seed. The infestation in Asotin County probably started from contaminated rice hulls or grass seed. Purple starthistle occurs in California, Utah, and in Converse County, Wyoming. Iberian starthistle is found only in California. Take extra precautions when dealing with products from areas of known infestations.

Biological

No biological control program is being developed for these species. Reports from Europe state that two species of *Bangasternus*, a seed head weevil, introduced for two other *Centaurea* species (yellow starthistle and diffuse knapweed) have biotypes that utilize purple starthistle there. No plans are underway to introduce them here. Biological control is not an appropriate method when the goal is eradication.

Chemical

Herbicides are most effective if applied in the spring when plants are in the sensitive seedling or rosette stages, are actively growing, and soil moisture is high. For recommendations, refer to the section on *Centaurea* species in the *Pacific Northwest Weed Control Handbook*, an annually revised Extension publication available from the Extension Services of Oregon State University, Washington State University and the University of Idaho. A single application probably will not eradicate the weed; all sites must be monitored for several years after the last plant is seen.

Cultural

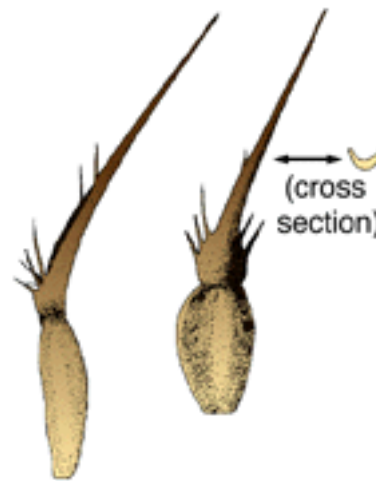
Grubbing or digging can control small infestations. This is most effective for young rosettes. Cut plants at least 2 inches below the soil surface early in the growing season. Plants are more easily seen after the flower stem has elongated, but it is best to chop them before any flowers open. If you do chop older plants with flowers, remove and destroy plants because they probably contain viable seed. Field tests in California showed 10% to 15% resprouting from cutting, even when the cut was made well below the base of the crown. Thus, follow-up treatments become necessary.

Do not mow purple or Iberian starthistles. Rosettes are too low to be mowed. Mowing older plants encourages development of multiple rosettes from one root base, and spreads purple starthistle by throwing seed heads.



Flower head of purple starthistle.

Illustration by Cindy Roché.



Enlargement of bract from flower head. Note that the spine is grooved on top as viewed in cross section.

Illustration by Cindy Roché.

References

Abrams, L. and R. S. Ferris. 1960. *Illustrated Flora of the Pacific States*. Stanford University Press, Stanford, CA.

Amme, D. 1985. *Controlling purple starthistle: a case study*. Fremontia (Calif. Native Plant Soc.) 13:22-23.

Jepson, W. L. 1925. *A Manual of the Flowering Plants of California*. Sather Gate Bookshop, Berkeley, CA.

Keffer, M. 1982. Iberian Starthistle. Detection Manual, State of California Dept. of Food and Agric., Sacramento, CA.

Pratt, D. 1987. Purple starthistle control. *Stock Talk* 3:6-7. (bi-monthly newsletter of University of California, Davis, Cooperative Extension)

Robbins, W. W., M. K. Bellue, and W. S. Ball. 1951. *Weeds of California*. State of California, Sacramento, CA.

Roché, B. F., Jr. and C. J. Talbott. 1986. The collection history of *Centaureas* found in Washington State. Agric. Research Center Res. Bull. XB0978. Washington State University, Pullman, WA.

Whitson, T. D. (ed.) 1987. Weeds and Poisonous Plants of Wyoming and Utah. Res. Rep. 116-USU, B-855-UW, Coop. Ext. Serv. University of Wyoming and Utah State University.

Whitson, T. D., M. A. Ferrell, and S. D. Miller. 1987. Purple starthistle (*Centaurea calcitrapa* L.) control within perennial grass species. Res. Prog. Rep. West Soc. Weed Sci. p. 71.

By Cindy Talbott Roché, Ph.D., former Washington State University Cooperative Extension associate; and Ben F. Roché, WSU Cooperative Extension range management specialist (deceased).

Photos by Cindy Roché and Dave Pratt, University of California at Davis Cooperative Extension farm advisor. Drawings by Cindy Roché.

Use pesticides with care. Apply them only to plants, animals, or sites listed on the label. When mixing and applying pesticides, follow all label precautions to protect yourself and others around you. It is a violation of law to disregard label directions. If pesticides are spilled on skin or clothing, remove clothing and wash skin thoroughly. Store pesticides in their original containers and keep them out of the reach of children, pets, and livestock.

Pacific Northwest Extension publications are jointly produced by the three Pacific Northwest states—Washington, Oregon, and Idaho. Similar crops, climate, and topography create a natural geographic unit that crosses state lines. Since 1949, the PNW program has published more than 450 titles. Joint writing, editing, and production has prevented duplication of effort, broadened the availability of faculty specialists, and substantially reduced costs for the participating states.

Pacific Northwest Extension Publications contain material written and produced for public distribution. You may reprint written material, provided you do not use it to endorse a commercial product. Please reference by title and credit Pacific Northwest Extension Publications.

Issued by Washington State University Cooperative Extension, Oregon State University Extension Service, University of Idaho Cooperative Extension System, and the U. S. Department of Agriculture in furtherance of the Acts of May 8 and June 30, 1914. Cooperative Extension programs and policies comply with federal and state laws and regulations on nondiscrimination regarding race, color, gender, national origin, religion, age, disability, and sexual orientation. Evidence of noncompliance may be reported through your local Cooperative Extension office. Trade names have been used to simplify information; no endorsement is intended.

Published March 1990. Reprinted April 1998. PNW350 \$1.50

