



Yellow Starthistle

Centaurea solstitialis L.

Sunflower family (Asteraceae)

NATIVE RANGE

Africa, temperate Asia and Eurasia (Balkan-Asia Minor, the Middle East and south-central Europe) Mediterranean region of southern Europe and northern Africa, especially Turkey

DESCRIPTION

Yellow starthistle is an annual herbaceous plant. Plants are gray-green to blue-green, grow from 6 in. to 5 ft. (15 cm to 15 dm) in height, and have deep taproots. Flowers are bright yellow with sharp spines surrounding the base, giving the plant a particularly menacing appearance and a painful response if touched. Stems and leaves are covered with cottony wool. Basal leaves are 2 to 3 in. (6-7 cm.) long and deeply lobed. Upper leaves are short (0.5 to 1.0 in.; 1 to 2.5 cm) and narrow, with few lobes.

ECOLOGICAL THREAT

Yellow starthistle is a strong invader that has been found in nearly every county in California and appears to be moving north and eastward. Some specialists liken its invasion to that of leafy spurge in North Dakota and Montana. As the plant infests an area, it chokes out the native plants, reducing biodiversity and wildlife habitat and forage. Another concern associated with the plant is "chewing disease" that develops in horses that have eaten yellow starthistle. This disease affects horses' nervous system and is usually fatal. Yellow starthistle does best in areas with a summer drought. It has been present in the Mid-West and eastern US for decades but has not built up high densities and is not considered a threat to areas with summer rainfall which includes most of the area east of the Rocky Mountains.



DISTRIBUTION IN THE UNITED STATES

According to the USDA, yellow starthistle occurs throughout the United States in forty-one states, with the exception of Maine and Vermont, five southeastern states, and Alaska and Hawaii. Yellow starthistle is most concentrated in California, where the plant infests nearly 12 million acres of rangeland and wildland. It is also reported to be invasive in natural areas of Idaho, Oregon, New Jersey, Utah, and Washington, according to the Alien Plant Working Group and five western national parks - Death Valley National Park, Glen Canyon National Recreation Area, Redwood National Park, Sequoia and Kings Canyon National Parks, and Yosemite National Park.

HABITAT IN THE UNITED STATES

Yellow starthistle is found typically in full sunlight and deep, well-drained soils, where annual rainfall is between 10-60 inches, and is especially common in disturbed areas such as roadsides.

BACKGROUND

Yellow starthistle was probably introduced into the United States through contaminated alfalfa in the mid-1800's.

BIOLOGY & SPREAD

Spread of yellow starthistle is by seed and each seedhead can produce from 35 to approximately 80 seeds. However, the seeds have no wind-dispersal mechanisms so few seeds move more than two feet from the parent plant without assistance. Therefore, animals and human influences, such as vehicles, contaminated crop seed, hay or soil, and road maintenance, contribute greatly to the plant's rapid and long-distance spread.

MANAGEMENT OPTIONS

A variety of methods are available for managing yellow starthistle, ranging from biological, chemical, and mechanical. For this reason, an integrated weed management plan, including tactics to prevent the spread of yellow starthistle outside of infested areas, is recommended. For example, when driving, walking, or moving livestock through infested areas, clothing, vehicles, and animals should be inspected and cleaned to remove any seeds before continuing on into uninfested areas.

Biological

Six biological control insects have been released in the United States for yellow starthistle control: *Bangasternus orientalis*, *Eustenopus villosus*, *Urophora jaculata*, *Urophora sirunaseva*, *Larinus curtus*, and *Chaetorellia australis*. Of these, five became established and three (*B. orientalis*, *U. sirunaseva* and *E. villosus*) are widespread. Also, the accidentally introduced fly, *Chaetorellia succinea* has a strong affinity to yellow starthistle and is found almost everywhere yellow starthistle occurs. All of these insects attack the seedhead of yellow starthistle, effectively limiting the number of seeds the plants are able to produce. Current research indicates that the insects have reduced seed yield by at least 50%. The rust fungus, *Puccinia juncea* var. *solstitialis* was released in California in 2003. It is too early to know if this rust will establish and eventually cause high mortality of yellow starthistle in the wild. Several more fungi and insects are currently being tested for introduction into the United States.

Chemical

Application of the systemic herbicides clopyralid or picloram between December and April seems to be the most effective. Application during the winter encourages the growth of other, more desirable, plants.

Mechanical

Mowing is effective during the early flowering stage or when most buds have produced spines. However, it is only successful when no leaves are present below the level of the cut.

Grazing

Sheep, goats, and cattle can graze on yellow starthistle in early spring, before the flower's spines develop. Goats will also graze plants in the spiny or flowering stages. Grazing reduces biomass and seed production.

USE PESTICIDES WISELY: Always read the entire pesticide label carefully, follow all mixing and application instructions and wear all recommended personal protective gear and clothing. Contact your state department of agriculture for any additional pesticide use requirements, restrictions or recommendations.

NOTICE: mention of pesticide products on this page does not constitute endorsement of any material.

CONTACTS

For more information on the management of yellow starthistle, please contact:

- Joe DiTomaso, University of California-Davis, ditomaso at vegmail.ucdavis.edu
- Weed Records and Information Center (WeedRIC) - Yellow Starthistle <http://wric.ucdavis.edu/yst>
- The University of California Pest Management Guides - Yellow Star-thistle <http://www.ipm.ucdavis.edu/PMG/PESTNOTES/pn7402.html>
- Encycloweedia - <http://pi.cdfa.ca.gov/weedinfo/centaurea2.htm>

OTHER LINKS

- <http://www.invasive.org/search/action.cfm?q=Centaurea%20solstitialis>

AUTHOR

Alicia Murphy

EDITOR

Jil M. Swearingen, National Park Service, Center for Urban Ecology, Washington, DC

REVIEWERS

Joe DiTomaso, Michael Pitcairn, and Steve Schoenig

PHOTOGRAPH

Jerry Asher, USDI Bureau of Land Management

REFERENCES

Bossard, Carla C., John Randall, and Marc C. Hashovsky. Invasive Plants of California's Wildlands. University of California Press, Berkeley. 2000.

DiTomaso, Joseph M., et al. The UC Pest Management Guides – Yellow Star-thistle.
<http://www.ipm.ucdavis.edu/PMG/PESTNOTES/pn7402.html>. Feb 1999.

DiTomaso, Joseph M.. WeedRIC – Yellow Star-thistle Information. <http://wric.ucdavis.edu/yst/>. 2001.

Royer, France and Richard Dickinson. 1999. Weeds of the Northern U.S. and Canada. University of Alberta Press and Lone Pine Publishing.

Swearingen, J. 2009. WeedUS Database of Plants Invading Natural Areas in the United States: Yellow Starthistle (*Centaurea solstitialis*). <http://www.invasive.org/weedus/subject.html?sub=4390>.

USDA Agricultural Research Service Germplasm Resources Information Network. 2004. <http://www.ars-grin.gov>

USDA, NRCS. 2009. The PLANTS Database (<http://plants.usda.gov>). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

Whitson, Tom D. (et al.). 2000. Weeds of the West. Western Weed Science Society of America.