



YELLOW STARTHISTLE MANAGEMENT FOR HOMEOWNERS

by Bob Callihan, Larry Smith and Ed Michalson



INTRODUCTION

Yellow starthistle is a problem weed for many urban homeowners. Yellow starthistle spines injure people and animals. The plants suppress desirable vegetation, mar the appearance of urban landscapes, and interfere with the use of gardens, alleyways, paths, and play areas. Urban areas particularly susceptible to yellow starthistle encroachment are vacant lots, back alleys, industrial areas, railroad sidings, unpaved equipment parking lots, and other unused or untended areas.

Yellow starthistle is designated noxious by law. The purpose of this law is to protect the property of others from infestation. This law requires, in most counties, that owners of infested property destroy the weed. Controlling yellow starthistle and other weeds in the urban landscape can be both beneficial and cost-effective because it can help maintain property values.



WHERE DID IT COME FROM?

Yellow starthistle, a native of Eurasia, is thought to have been transported to Idaho in hay from California. It has spread into much of the semiarid northwestern U.S., including rangeland, small

farms, and urban property. Its movement over long distances is largely because of human activities and travel, including animals, vehicles, and various kinds of equipment.



BIOLOGY

Yellow starthistle (*Centaurea solstitialis*: *Asteraceae*) is a close relative of knapweed, artichoke, and wild chicory. It is easily recognized by its lobed leaves, yellow flowers and long needle-like spines found only on the bracts of the flower head. These spines form as the flower head forms, and fall off the flower head in the late autumn, so

IDENTIFICATION

the plant is spiny only in the summer and autumn. During the winter the slender stems lose color, turn gray, and the flower heads are topped by white hairy tufts. The leaves have a unique, persistent, bitter taste characteristic of many members of the *Centaurea*, or knapweed, genus.



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GROWTH HABITS

Yellow starthistle plants emerge from seeds in the fall and mature in late spring or summer of the following year. They are annuals, that is, a yellow starthistle plant completes its life cycle within a 12-month period, flowering in only one season, and producing only one crop of seeds. Yellow starthistle seeds germinate whenever conditions are favorable, however, so small plants may be found emerging after rainy periods in spring or summer as well. If they germinate in late summer they may produce flowers, but are likely to die without producing seeds. If they germinate in early fall, they will produce large, vigorous rosettes that do not bolt or flower until the following year, when they will be the largest of that year's seed-producing population. Yellow starthistle produces up to 150,000 seeds per

plant. Most germinate the first two or three years after they ripen, but a small fraction of the seeds can remain dormant in the soil for as long as 10 years before germinating. The weed grows in a variety of conditions, including dry and shallow soil. Its rapid root and shoot growth enable it to grow faster to outcompete most other plants in semiarid environments, which is why it forms dense populations, dominating the plant community it infests. Its aggressive, competitive nature is demonstrated by its establishment on more than 300,000 acres in north central Idaho. During the past 40 years, including lawns, vacant lots, alleys, small land holdings, and extensive acreages of marginal rangeland.



CONTROL MEASURES FOR YELLOW STARTHISTLE

MANUAL LABOR

Hand weeding is one of the most important means of controlling yellow starthistle in homesites. Hoeing, hand pulling, or various weed digging devices is best in gardens and other areas where herbicides may injure desirable plants. Hand pulling works best when the plants are large enough that they will not break off to leave the crown and roots and later resprout. Hand removal by pulling or digging is appropriate when only a very few plants are found in a sparsely infested area. Digging and

pulling are useful, but if the soil contains seeds from the previous year's plants, soil disturbance from pulling or digging will favor growth of more seedlings. Mowing yellow starthistle is seldom fully effective, because mowed plants produce more side branches below mowing height and these low branches will produce seeds. Mowing this weed after its stems elongate above the mower's cutting height will reduce the weed's seed production, however, and can improve the appearance of an infested area.

HERBICIDES

Short-term control of yellow starthistle in urban areas can be achieved by using herbicide products that are labeled for that use. Repeated applications (2-3 times per year) of over-the-counter systemic herbicides that are labeled for selective control of broadleaf weeds in lawn grasses are effective when begun in late winter or early spring when yellow starthistle is in the seedling or small rosette stage. Such treatment only suppresses yellow starthistle for a year, but if there is a good stand of a well-adapted turfgrass, and if other good lawn management practices are followed, yellow starthistle can be reduced to the point where it warrants less frequent use of herbicides or occasional hand work.

Yellow starthistle growing along sidewalks, in cracks in concrete or asphalt paving, in parking lots, and in waste areas may be best managed with a

suitable herbicide. Herbicides are generally efficient where mechanical removal is ineffective, too difficult, or too time-consuming.

The primary limitation of herbicide use is that herbicides that are most effective on yellow starthistle are also hazardous to other plant species. When used as directed by the label, herbicides useful for yellow starthistle control are not hazardous to humans, but failure to observe label instructions can endanger valuable plants and water quality.

Many herbicides registered for use in home lawns and gardens are listed in the Pacific Northwest Weed Control Handbook. All pesticide products must be applied in accordance with product labels. Applicators are legally liable for improper use of any pesticide.

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BIOLOGICAL CONTROL

INSECTS AND PATHOGENS

University and USDA researchers are evaluating parasitic insect species and fungi to determine if they can be used to reduce yellow starthistle populations without affecting other organisms.

These parasites have not yet been successful in the Pacific Northwest and may never suppress yellow starthistle adequately for urban purposes, but may help greatly.

PLANT COMPETITION

Desirable, competitive vegetation has long been known to provide the most effective, long-lasting, economical weed control. Competitive vegetation is effective against all weeds, not just yellow starthistle. Grasses are normally the choice for urban landscape vegetation because they are well adapted to persist where yellow starthistle can invade, and because they will tolerate selective herbicides that occasionally must be used for corrective action. Even vigorous grasses will not protect every area once yellow starthistle becomes established, without the support of occasional corrective action to destroy the weed.

Yellow starthistle does not thrive in deep shade, so close-planted trees and tall, leafy shrubs will keep

yellow starthistle suppressed. Yellow starthistle is seldom found directly beneath shade trees or conifers, but will thrive near those ornamentals.

When unused urban areas such as vacant lots, industrial surroundings or equipment lots are not planted to a dense turf or other competitive vegetation, yellow starthistle invades readily. If they are planted and some care is provided to maintain grass vigor and remove occasional invading yellow starthistle plants, control of that weed is not difficult. Such areas should be planted to low-growing grasses that will survive drought stress, maintain density, but not grow so tall as to cause a fire hazard.

GRASSES

In unirrigated areas, low-maintenance grasses are most suitable. Fine-leaved bunch-type fescues have the best root systems, are not very tall, grow well in warm winter periods and early spring to compete with yellow starthistle seedlings, and withstand drought very well. Sheep fescue, hard fescue, and native Idaho fescue, once established, are long-lived and well suited to compete against annual weeds such as yellow starthistle. Canada bluegrass, Canby bluegrass, and Sherman big bluegrass are fairly short, creeping grasses, and also provide long-lasting, competitive ground cover for protecting against yellow starthistle in the Inland Northwest. Although taller grasses such as pubescent, intermediate, bluebunch, and crested wheatgrass resist yellow starthistle invasion very well, shorter, slower-growing grasses require less mowing, cause less fire hazard, are less susceptible to grass bugs, and are less apt to harbor rodents and other vermin.

In irrigated lawns, any of the widely-used species such as Kentucky bluegrass or creeping red fescue will suppress yellow starthistle.

Regardless of the kind of grass that is seeded, weeds must be suppressed while a new seeding of grass is getting established. Grass seedlings cannot survive against competition from more vigorous seedlings of annual weeds such as yellow starthistle or

cheatgrass. When new grass is not properly planted and cared for, the young seedlings die, and yellow starthistle soon returns.

Where the ground is not irrigated, grasses are best seeded into moist soil in mid autumn immediately after fall-germinating yellow starthistle, cheatgrass, and other weeds have been killed. Grass seedlings have been successful by waiting to plant until yellow starthistle, cheatgrass, and other fall-germinating weeds have emerged after the fall rains. The weeds are first killed with either shallow tillage or a non-selective herbicide, and then the grass is seeded.

On areas large enough to operate equipment, it is best to seed grasses into undisturbed soil with a conventional agricultural drill that uses double-disks to cut a furrow into which the seeds are dropped, and which is closed with a packing wheel or chain drag. Where such equipment cannot be used, the seed may be broadcast over the soil surface and covered with soil by raking the soil to a depth of 1/4 inch, or covered with a mulch of organic material. This allows the grass freedom from weed competition in the early seedling stage because the most autumn-germinating weeds have been killed, and the soil is not tilled deeply enough to bring up dormant seeds from deeper in the soil.

LAWNS

Irrigated lawns normally do an excellent job of excluding yellow starthistle because they are often fertilized well, mowed closely and occasionally treated with a herbicide that selectively kills weeds. That usually keeps yellow starthistle from seriously invading a lawn. If you intend to plant or maintain a conventional lawn that is exposed to invasion by yellow starthistle seeds, follow the guidelines in University of Idaho EXT 565, *Establishing and Maintaining Idaho Lawns*. For more thorough

information on the principles of turfgrass weed control, see University of Idaho Current Information Series (CIS) 888, *Weed Control in Lawns*, and CIS 731, *Thatch Control in Lawns*. Both provide helpful information on lawn care. "Turfgrass Weed Control" is an informative chapter in each annual issue of the *Pacific Northwest Weed Control Handbook*, published jointly by the University of Idaho, Oregon State University, and Washington State University.



CONTROL STRATEGIES

LONG-TERM, ENVIRONMENTAL CONTROL

The major reason that urban properties become badly infested with yellow starthistle and other weeds is that homeowners do not follow a strategic vegetation management plan. Good plant management practices result in healthy, vigorous turf and ornamentals that will be competitive enough to resist weed invasion. This will reduce dependency on corrective measures such as herbicide applications and hand pulling. Vigorous, healthy turf and ornamentals requires attention to correct mowing, fertilization, thatch control, disease and insect control, and irrigation.

Management strategies for yellow starthistle include use of most or all of the practices previously discussed, depending on needs of the particular site. Although managing is time-consuming and com-

plex, it can be achieved by landowners who are willing to invest the necessary time and resources. Each property owner must ultimately bear the burden for managing yellow starthistle.

Community action is needed for the most successful strategic plan. Owners of neighboring properties should cooperate to prevent large-scale seed production and invasion of yellow starthistle from adjacent land. Cooperative community action is the basis of the noxious weed law, and should result in compliance with the law in a way that is not unreasonably burdensome for anyone. Cost-share programs normally are not available from county, state, or federal agencies for urban property; however, cooperative action by groups of urban homeowners could result in reduced costs for all concerned.



ECONOMICS OF YELLOW STARTHISTLE CONTROL FOR HOMEOWNERS

For controlling yellow starthistle in lawns, along sidewalks, on driveways, and in waste areas with herbicides, all of the chemicals needed can be purchased at garden supply stores. The cost of the materials generally varies between \$5 and \$25 per year. A hand pump sprayer can be purchased for between \$25 and \$50. A typical sprayer should last from 5 to 10 years if it is well-kept, so its average cost will from \$3 to \$6 per year for purchase and repairs. The annual out-of-pocket cost of controlling yellow starthistle for a typical homeowner where the weed is prevalent may vary between \$15 and \$35 per year. Most of the additional cost is in labor, which can require as much as 20 hours per year to

control yellow starthistle around an average urban home. Controlling yellow starthistle should be integrated with control of other weeds around a homesite. When that is done, the cost of yellow starthistle can cover the cost of controlling most other weeds around the homesite as well, and the benefits will likely be a home with much better landscape care overall.

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