

Invasive weeds in forestland: Gorse

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Gorse is a spiny, evergreen shrub native to the western seaboard of continental Europe and the British Isles. It was introduced to the West Coast at Bandon, Oregon, as an ornamental in the 1890s. Gorse infestations are concentrated along the Oregon Coast, particularly on the south coast, with some infestations inland.

Gorse is a legume, a member of the pea family. Gorse produces abundant seed contained in hairy pods 0.5 to 0.75 inch long. The seeds are brown when ripe. Seed can remain viable in the soil for 30 years. Disturbances such as land clearing, timber harvesting or fire stimulate the germination of buried seed. Gorse also can spread vegetatively: If cut, it can resprout quickly. Thus, once established, gorse is difficult to eradicate.



Figure 1. Gorse invading pasture and forestland.

Credit: Norma Kline, © Oregon State University



Figure 2. Gorse flowers and spines.

Credit: Norma Kline, © Oregon State University

Being a nitrogen fixer, gorse easily colonizes newly disturbed sites, poor sites or sites without vegetation. It often is found along roadsides. On the southwest Oregon Coast, gorse has taken over sand dunes. Its dense, impenetrable stands make the areas unusable for recreation. Gorse outcompetes native vegetation, reducing native plant diversity and degrading wildlife habitat. Dense gorse stands also pose a significant fire hazard because the foliage is highly flammable, and dead foliage collects as litter within and at the base of the plant. Gorse contributed to the Bandon Fire of 1936, in which the entire town nearly burned to the ground.

Gorse can grow up to 15 feet tall and 10 to 30 feet in diameter, forming a dense, compact shrub (Figure 1). Gorse has bright yellow, pealike flowers 0.5 to 0.75 inch long at the end of branches (Figure 2). Branches are dark green with conspicuous spines. Juvenile leaves are trifoliate, and spines develop as the branch matures.

You can learn how to prevent, reduce and control gorse on forestland, which has specific herbicide regulatory requirements. There are also practical considerations for controlling gorse in reforestation areas.

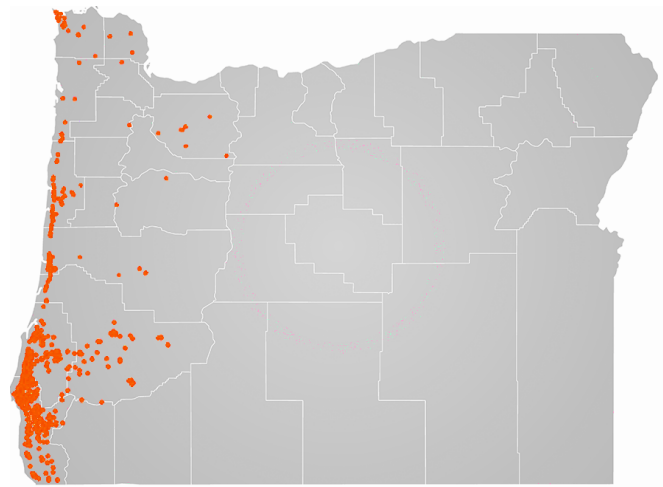


Figure 3. Gorse distribution in Oregon.

Map: Weedmapper

Management options

Several methods will prevent, control or reduce gorse. The first strategy is preventing gorse from gaining a foothold on your property. If you already have gorse on your property, the most effective ways to control gorse entail a combination of chemical, mechanical and biological methods. Well-established gorse may be impossible to eradicate, but it can be reduced significantly.

Prevention

Prevention is key to reducing new gorse infestations. Be sure to clean mechanical equipment to rid equipment of seed before using the equipment on other sites. If you spot new gorse plants on your property, immediately pull or treat them to prevent a large infestation. Look for new gorse patches when gorse is in peak bloom, from January to March. Note the location on a map or mark the area on the ground. After treatment, go back and monitor the area annually to determine whether control has been successful. Re-treat if necessary.

Chemical control

Note: Read and follow herbicide labels carefully. Before spraying over or around tree seedlings, ensure the chemicals pose no hazard. Before you apply herbicide on forestland, you must file a “notification of operations” with the Oregon Department of Forestry at least 15 days in advance. Consult your local Extension agent or Oregon Department of Agriculture representative for specific recommendations for your situation.

Gorse can be controlled with herbicides from spring through fall. Fall is often the best time, as plant carbohydrates move down into the roots along with the herbicide, killing the root system. Year one is critical in a long-term management plan. Spray gorse resprouts within six months of completing mechanical removal or mulching. There are two options:

1. Grind and mulch in spring, followed by spraying gorse resprouts in fall.
2. Grind and mulch in fall, followed by spraying gorse resprouts in spring.

Triclopyr products are the best herbicide option for gorse control and can be mixed with other herbicides shown in Table 1. Please note that some herbicides listed should not be used near water. All the herbicides mentioned in Table 1 are labeled for use in forestry applications. Follow all label recommendations — the label is the law.

Table 1. Herbicides effective at controlling gorse on forestland

Product Name	Chemical	Application method	Comments
Ultra, Element 4 (Garlon 4)	triclopyr ester	Foliar spray	Do not apply near water. Avoid applying on warm days to prevent volatilization.
Vastlan (Garlon 3A)	triclopyr amine	Foliar spray or cut stump	Can use near water. Apply full- or diluted-strength for cut stump treatments.
Escort	metsulfuron	Foliar spray	A soil-active herbicide that controls germinating weeds. Do not apply near water.
Capstone	aminopyrid+tricolopyramine	Foliar spray or cut stump	Apply soil-active herbicide that controls germinating weeds. Not for release, unless a directed spray.
Opensight	aminopyralid+metsulfuron	Foliar spray	A soil-active herbicide that controls germinating weeds. Do not apply near water. Can be used for releasing tree seedlings. Caution: for conifer release, spot sprays can injure seedling foliage. For site preparation, delay planting tree seedlings for two months west of the Cascades and four months east of Cascades.

When foliar spraying, it is critical to use a good surfactant (methylated seed oil or silicone-based) and thoroughly wet the entire plant. Any untouched surface, even the undersides of branches, will survive. The cut stump method can be an effective way to kill larger plants. Cut the main stump and apply herbicide to the cut surface, where it will be carried down to the roots. Read the label carefully to ensure that you don't exceed application rates.

In any herbicide treatment program, rotate among chemicals to prevent the development of herbicide-resistant strains of the weed. For details on herbicide resistance, refer to the current edition of the [PNW Weed Management Handbook \(https://pnwhandbooks.org/weed/agrichemicals/managing-herbicide-resistant-weeds\)](https://pnwhandbooks.org/weed/agrichemicals/managing-herbicide-resistant-weeds). For information regarding vegetation control approaches in forestry applications, including the susceptibility of conifers to herbicides, see the [Forestry and Hybrid Cottonwoods section of the PNW handbook \(https://pnwhandbooks.org/sites/pnwhandbooks/files/weed/chapterpdf/forestry-hybrid-cottonwoods.pdf\)](https://pnwhandbooks.org/sites/pnwhandbooks/files/weed/chapterpdf/forestry-hybrid-cottonwoods.pdf).

For pollinator protection information, see [How to reduce bee poisoning from pesticides. \(https://extension.oregonstate.edu/catalog/pub/pnw-591-how-reduce-bee-poisoning-pesticides\)](https://extension.oregonstate.edu/catalog/pub/pnw-591-how-reduce-bee-poisoning-pesticides)

Mechanical control

Chopping, cutting and mowing can work in areas accessible to machinery. Hand pulling aided by a weed wrench and digging with large equipment can be effective on individual or small groups of plants. In areas where large stands of gorse are extensive, use excavators with heavy-duty or masticating mowing heads to grind gorse to a mulch. Leaving mulch in place helps keep gorse seeds from germinating. Use herbicide or grazing animals to control resprouting after mechanical removal. Note that all mechanical methods disturb the soil and may encourage dormant seed germination in the soil. On steeper ground, you may have to cut it by hand with chain saws. Wear protective clothing and gloves. To prevent spreading gorse seed, thoroughly clean equipment and vehicles on site before moving equipment to new areas.

A combination of mechanical and herbicide methods provides the most effective gorse control:

- **Step 1:** Use mechanical equipment in a slow and deliberate manner, with a goal of grinding gorse stems and mulching gorse material on site.
- **Step 2:** Within six months, spray gorse resprouts and seedlings (spring or fall) with a site- appropriate Triclopyr product.
- **Step 3:** Re-treat regrowth and seedlings each year.

Grazing

On pastureland that is being converted (planted) back to forest, goats, sheep and cattle can graze small gorse seedlings if foliage is tender to help prepare the site for tree seedlings. Continual grazing in an area reduces the number of plants and inhibits seed production. Intensive grazing should occur one to two years before tree seedlings are planted to avoid browsing damage. To eradicate gorse in these areas, however, grazing must be combined with mechanical and chemical control measures.

Conifer shade

Some long-term studies have shown that shade can help deter gorse development. Planting conifers may be effective in the long run if successfully established to create dense canopy shade. Plant large, bare- root seedlings at a density of 10 feet by 10 feet or 12 feet by 12 feet. Planting at a closer spacing (9 feet by 9 feet) may expedite canopy closure but will require precommercial thinning at age 12–15 years.

Control of gorse in conifer plantations requires careful spot spraying during the conifer dormant season to avoid damaging conifer seedlings. Using black plastic mulch mats can also reduce competition from gorse and other competing vegetation to boost the survival and growth of tree seedlings. Use mats that are 4 feet by 4 feet. Secure mats to the ground with rocks, debris or pins so that they don't blow away or cover the seedlings and smother them.

Biological control

Biological controls for gorse approved for release in Oregon include:

- Seed weevils: The seed weevil consumes gorse seeds and spines. The weevil destroys between 20% and 60% of seed, reducing seedling recruitment and overall spread.
- Spider mites: These insects feed on leaves, killing branches but rarely the entire shrub.
- Thrips: These insects feed on gorse foliage. As of 2024, thrips are established in Oregon and beginning to spread; researchers will assess impact levels in the coming years.

For more information on biological controls and photos for identification, see the [Oregon Department of Agriculture](https://www.oregon.gov/oda/programs/weeds/pages/biologicalcontrol.aspx). (<https://www.oregon.gov/oda/programs/weeds/pages/biologicalcontrol.aspx>)

Resources

- [Gorse Action Group](https://gorseactiongroup.org/control-management/) (<https://gorseactiongroup.org/control-management/>)
- [Oregon Department of Agriculture](https://www.oregon.gov/oda/programs/Weeds/OregonNoxiousWeeds/Pages/AboutOregonWeeds.aspx#gorse) (<https://www.oregon.gov/oda/programs/Weeds/OregonNoxiousWeeds/Pages/AboutOregonWeeds.aspx#gorse>)

Use pesticides safely!

- Wear protective clothing and safety devices as recommended on the label. Bathe or shower after each use.
- Read the pesticide label—even if you've used the pesticide before. Follow closely the instructions on the label (and any other directions you have).
- Be cautious when you apply pesticides. Know your legal responsibility as a pesticide applicator. You may be liable for injury or damage resulting from pesticide use.

Related publications

Garlic mustard, which originated in Europe, was recorded first in America in New York in 1868. It was probably introduced for use as a vegetable and as a garlic-flavored herb. By 2001, distribution had increased to 30 states, mainly in the Northeast and Midwest. In Oregon, it has been found in Multnomah and Clackamas counties (Figure 4, back page). It is one of the few alien herbaceous species that invades and dominates forest understories (Figure 1). It has no known natural enemies in North America and is difficult to eradicate once established. Garlic mustard appears to alter habitat for native birds, mammals, and amphibians and may affect their populations and diversity. Once introduced, it competes native plants for moisture, nutrients, and space.

Description
Garlic mustard is a biennial herb with stalked, coarsely knotted leaves that are triangular to heart-shaped (Figure 2) and give off the



Figure 1—Garlic mustard in forested understory. Photo: Glenn Miller, Oregon Department of Agriculture.

(Figure 3). The flower stalk is 2 to 3.5 feet high with a cluster of small white flowers, each with four petals in the shape of a cross. A single plant can produce as many as 3,000 seeds. Seeds lie dormant for at least a year before germinating and can remain viable for 5 years or more.

Management options
Several methods are available for managing garlic mustard. For this reason, an integrated weed management plan, including tactics to prevent the spread of garlic mustard outside infested areas, is recommended. A combination of mechanical and chemical control may be appropriate depending on the sensitivity of the infested area and the extent of the infestation.

Biological control
Cornell University is coordinating an investigation into insects and fungi that are associated with garlic mustard in Europe. Those that prove to feed exclusively on garlic mustard and that pass all safety and specificity tests required by the U.S. Department of Agriculture will be brought to North America for field tests. However, the research is ongoing, and no release date has been set.

Chemical control
Note: Before you apply herbicide on forest land, you must file a "notification of operations" with the Oregon Department of Forestry at least 15 days in advance.

The following information about herbicides is only a brief summary; consult your local Extension agent or



Invasive Weeds in Forestland: Garlic Mustard

(<https://extension.oregonstate.edu/catalog/pub/ec-1592-invasive-weeds-forestland-garlic-mustard>)

Management options for garlic mustard in forest land: biological, chemical, and mechanical controls, plus grazing. Includes description of weed and its life cycle, history of infestation in the U.S. and West, and sources of more information.

Anonymous | Aug 2014 | EXTENSION CATALOG PUBLICATION [Peer reviewed \(Orange level\)](https://extension.oregonstate.edu/peer-review-guidelines) (<https://extension.oregonstate.edu/peer-review-guidelines>)

Yellow starthistle, a native of the Mediterranean region, arrived in this country in 1869 as a contaminant in alfalfa seed. It is a strong invader of disturbed areas, rangelands, and roadsides and thrives in areas of summer drought. A yellow starthistle invasion will reduce biodiversity by choking out native plants. It also is poisonous to horses, causing a usually fatal nervous condition called chewing disease. Yellow starthistle flowers deep, well-drained soil, full sunlight, and an annual rainfall between 10 and 60 inches.

Description

Yellow starthistle is a winter annual, maturing at heights of 24 to 72 inches (Figure 1). A rosette of deeply lobed leaves up to 8 inches long forms after seed germinates in the fall (Figure 2). Yellow flower heads develop at the tips of branched stems from late spring until fall. Flower heads bear stiff, sharp thorns about 0.75 inch long (Figure 3). Each seed head produces from 35 to 80 seeds. The seeds cannot disperse via wind, so they need help to move more than a few feet from the parent plant. Human activity such as off road vehicle and pedestrian travel, cattle grazing, and road and power



Figure 1 – Mature yellow starthistle.



Figure 2 – Yellow starthistle rosette.



Figure 3 – Yellow starthistle rosette with thorns.

infested areas, is recommended. For example, when driving, walking, or moving livestock through infested areas, inspect and clean clothing, vehicles, and animals to remove any seeds before continuing on into uninfested areas.

Biological control

Six biological control insects have been released in the United States for yellow starthistle control:

- The seed head weevil, *Baryscapus orientalis*, *Eurostoma villosus*, and *Larinus curtus*
- The seed head gall flies (*Elyophora jacobaeae*, *Elyophora atramentosa*, and *Chaetorellia australis*)

Of these, five became established and three (*B. orientalis*, *E. atramentosa*, and *E. villosus*) are widespread. Also, the accidentally introduced seed head gall fly, *Chaetorellia macronis*, has a strong affinity to yellow starthistle and is found almost everywhere yellow starthistle grows.

All these insects attack the seed head of yellow starthistle, effectively limiting the number of seeds the plants are able to produce. Current research indicates the insects have reduced seed yield by at least 50 percent.

The root fungus *Puccinia juncus* var. *solstitialis* was released in California in 2003. It is too early to know whether this root will establish and eventually cause high mortality of yellow starthistle in the wild. Several more fungi and insects are being tested for introduction into the United States.



Figure 3 – Yellow starthistle flower and spine. Photo: Greg Winters, De. County Blvd.

Invasive Weeds in Forestland: Yellow Starthistle

(<https://extension.oregonstate.edu/catalog/pub/ec-1600-invasive-weeds-forestland-yellow-starthistle>)

Management options for yellow starthistle in forest land: biological, chemical, and mechanical controls, plus grazing. Includes description of weed and its life cycle, history of infestation in the U.S. and West, and sources of more information.

Anonymous | Aug 2018 | EXTENSION CATALOG PUBLICATION [Peer reviewed \(Orange level\)](#) (<https://extension.oregonstate.edu/peer-review-guidelines>)

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