

St. Johnswort (*Hypericum perforatum*)

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Even though St. Johnswort (also known as common goatweed or Klamath weed) has received much attention as an antidepressant, this noxious weed poses a threat to Montana lands. This guide includes identification, biology and ecology, and management.

St. Johnswort, a member of the family Hypericaceae, is also known as common goatweed or Klamath weed. This species was introduced for ornamental and medicinal purposes and since has invaded the western rangelands. St. Johnswort poses a threat to the ecology of these lands by displacing desirable wildlife habitat and livestock forage plants. Although St. Johnswort has recently received much attention as a natural antidepressant, it is listed as a noxious weed by the state of Montana.

Identification

St. Johnswort is a taprooted perennial weed which reproduces by seeds and short runners (Figure 1). Plants can grow from 1 to 5 feet tall with numerous, rust-colored branches that are woody at the base. In autumn, infestations are easy to spot by the remaining rust-colored branches. The taproot may reach depths of 4 to 5 feet. Lateral roots grow 2 to 3 inches beneath the soil surface but may reach depths of 3 feet.

Leaves are opposite (see box at right), sessile, entire, elliptic to oblong and generally not more than 1 inch long. A diagnostic characteristic of St. Johnswort is the presence of tiny, transparent perforations on the leaves, thus the species

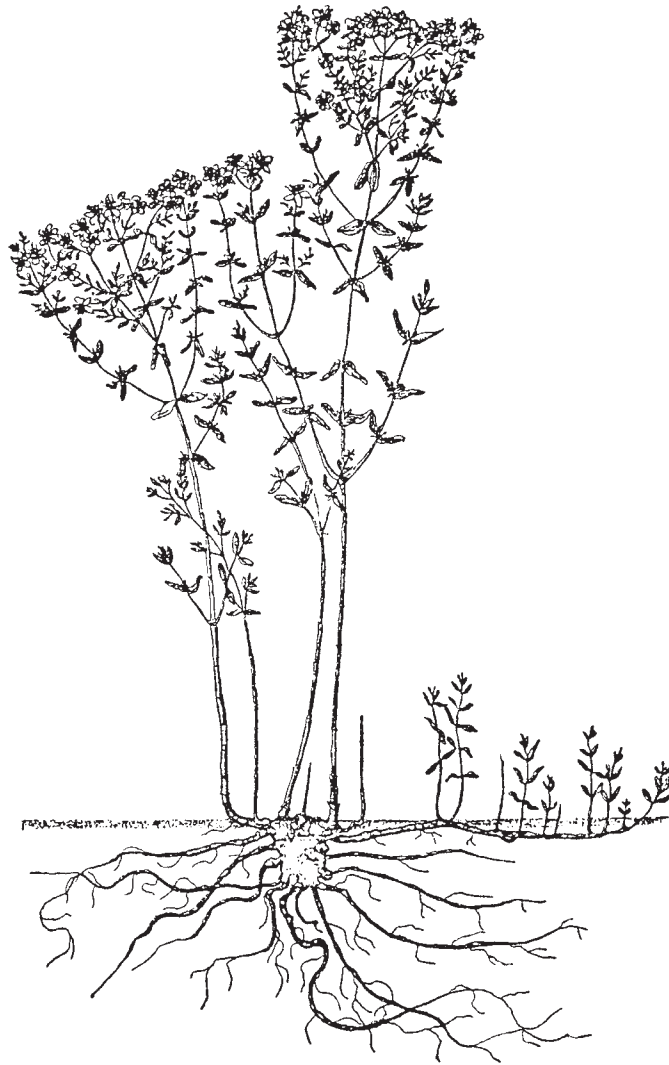


Figure 1. St. Johnswort is a taprooted perennial which reproduces by seeds and short runners.

name *perforatum* (Figure 2). These perforations can be seen when one holds the leaf up to a light source.

Flowers, which turn from east to west as the sun crosses the sky, occur in an open, flat-topped, terminal group. Flowers are bright yellow with five sepals and five petals (Figure 3). Petals are typically twice as long as sepals and bear black glands along the margins. Stamens are numerous and arranged in three groups. An egg-shaped, three-valved capsule bursts at maturity and releases many seeds.

History and distribution

Historically, St. Johnswort was believed to have great protective powers from evil spirits. The plant was originally cultivated for medicinal use in the treatment of mania, hysteria, hypochondriasis, depression, dysentery and jaundice. The plant continues to be used by folk medicine practitioners in Europe. Although native to Europe, North Africa and parts of Asia, St. Johnswort has been introduced into most continents for medicinal purposes and as an ornamental.

St. Johnswort was first brought into the United States in 1696 to Pennsylvania by a religious group who believed the plant held magical properties. The plant was first reported on western grazing grounds in 1893. Today, the weed can be found in the eastern half of the United States as well as the Pacific Northwest area south to northern California and central Nevada. Major infestations are present in Montana—the Montana Department of Agriculture reports about 500,000 acres of St. Johnswort in the state.

St. Johnswort generally likes well-drained gravely or sandy soils and favors sunny exposures. In the western U. S., the weed occupies lower elevations where annual precipitation is between 15 and 30 inches. Because it is not a highly competitive plant, St. Johnswort persists well

in disturbed areas that lack more competitive plant species.

Biology and ecology

Peak flowering occurs mid- to late June but flowering begins in May and continues through September. Developing seed capsules become green, moist and sticky. Each capsule can contain 400 to 500 seeds. The sticky capsules adhere to animals and humans who travel from place to place, spreading the seeds. Seeds can also spread short distances by the wind. Seeds may remain viable in the soil for up to 10 years.

A mature plant may produce up to 30 flowering stems annually. New crowns may be produced from lateral root buds. Crowns are usually well spaced, ranging from 12 to 37 per square meter.

Ecological and economic impacts

Dense stands of St. Johnswort can be a problem in pastures and rangelands because they displace native plants. The displacement of native and indigenous plant species may depreciate wildlife carrying capacity. Plant monocultures decrease biodiversity and increase a plant community's vulnerability to disease.

Economically, St. Johnswort affects livestock owners. When desired forage is scarce, livestock will consume the weed and may suffer from severe dermatitis. Hypericin, a pigment produced in the glandular dots of the foliage and petals, is phototoxic and causes blistering and itching on light-haired or unpigmented skin areas, such as the mouth, nose and ears. Animals affected by hypericism lose weight, are difficult to manage and lose market value. After ingestion of St. Johnswort, an animal may die of dehydration or starvation because of swelling and soreness of the mouth following an episode of hypericism.

St. Johnswort has recently been promoted as a natural "Prozac" or anti-depression drug. In some areas

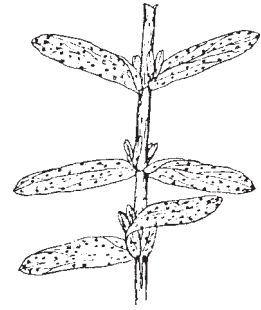


Figure 2. Leaves of St. Johnswort

Key to botany vocabulary

- calyx—the outermost series of floral parts
- entire—with an unbroken or smooth margin
- opposite—referring to leaf arrangement where leaves occur in pairs on opposite sides of a node
- sepal—one of the separate, usually green parts forming the calyx of a flower.
- sessile—without a stalk of any kind

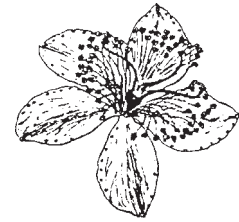


Figure 3. Flower of St. Johnswort

of the country, the plant is being cultivated and harvested for use in health products, such as herbal tea and dietary supplements. Infusions are given by herbalists for their astringent and diuretic properties as a treatment for urinary complaints, coughs and colds. In uncultivated situations, St. Johnswort can also be harvested and sold for herbal medicine purposes. Anyone interested in growing St. Johnswort commercially in Montana must contact their local county weed board to develop an approved management plan.

Management of St. Johnswort

St. Johnswort is best managed by adopting a preventive weed management strategy. Early detection is vital, along with avoiding the creation of areas devoid of more competitive plant species. Range management programs should focus on maintaining competitive, closed-canopy communities where St. Johnswort will find it difficult to establish.

On small, isolated infestations, hand pulling or digging of young plants may be effective. Repeated pulling or digging is necessary because lateral roots of older plants can give rise to new plants. Pulled or dug plants should be removed from the area and burned to prevent vegetative regrowth and/or seed dissemination. Mowing is ineffective as a management tool but may discourage the spread of the plant if done before seeds form. Burning may increase the density and vigor of St. Johnswort infestations.

An effort to manage St. Johnswort marked one of the first attempts to control a weed species by the introduction of insects into North

America. In 1945 the flea beetle *Chrysolina quadrigemina* was introduced in California. A major improvement occurred in California's rangelands. St. Johnswort was reduced to about 1 percent of its former level. A huge monument now stands in Humboldt County, California, in honor of the flea beetle.

Four biological control agents are currently recommended for St. Johnswort in Montana: *Chrysolina hyperici*, a foliage feeding beetle; *Aplocera plagiata*, a foliage and flower feeding moth; *Agrilus hyperici*, a root-boring beetle; and the flea beetle. *Crysolina hyperici* is better suited for wet sites than *C. quadrigemina*. *Agrilus hyperici* is established in eastern Washington, northern Idaho and Montana while *A. plagiata* is established in some areas of northern Washington. The success and populations of bioagents depends on the seasonal fluctuations of St. Johnswort populations.

Small infestations of St. Johnswort can be controlled by herbicides. In pasture, rangeland and noncropped sites, repeated foliar applications of 2,4-D at 2 quarts per acre will kill the plant in the seedling and pre-flowering stages. Spring application of 1 quart per acre of picloram is also recommended. St. Johnswort can be controlled after emergence with an application of metsulfuron at 1 ounce per acre. Repeated applications may be necessary. If herbicides are too costly, herbicide application on large scale infestations may not be economically justifiable, especially if repeated applications are necessary.

An integrated weed management program should be employed to adequately manage for St. Johnswort in

large scale infestations. Integrated weed management involves the use of several control techniques in a well-planned, coordinated and organized strategy to reduce the impact of noxious weeds on rangelands. If a St. Johnswort infestation is found, containment should be the first goal with emphasis placed on outlying plants. Outlying plant populations should be controlled through pulling and chemical means to stop the advancing front. Secondly, perimeter and core infestation zones should be addressed using physical, chemical and biological methods. Efforts should be focused on methods that stop seed dispersal and maintain a healthy plant community that leaves no space for the establishment of St. Johnswort.

Summary

Since the first report of St. Johnswort's presence in the United States in Pennsylvania in 1696, the weed has continued to spread and is now present throughout the western U. S. Although touted as a possible natural antidepressant, St. Johnswort causes considerable ecological and economic losses. Because St. Johnswort is difficult to control, prevention, early detection and containment are the keys in any weed management program. Most small infestations can be contained by repeated pulling, digging and application of herbicides. Large infestations may require the use of an integrated weed management program containing physical, chemical and biological controls. If you think you have a St. Johnswort problem or would like more information concerning the plant, contact your local weed district or county Extension office.

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