Hawkweeds

Hieracium aurantiacum, H. pilosella,

H. pratense, H. floribundum, H. piloselloides

Introduction

Ancient Greeks thought that hawks ate the sap of hawkweeds to sharpen their eyesight. Today, however, hawkweeds are an eyesore to those whose land they have invaded (Figure 1). These rapidly spreading, tenacious weeds, introduced from central and northern Europe, are recent arrivals in the west but are quickly making their presence known.

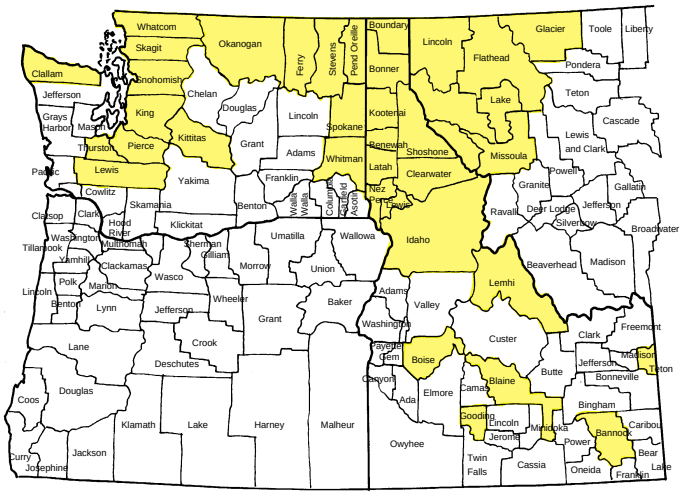
Hawkweeds belong to the chicory tribe of the sunflower family and are closely related to dandelion, sowthistle, prickly lettuce, and chicory. Plants in this tribe have flower heads with only ligulate flowers (like dandelion, not daisy), and contain a milky sap.

Five species of weedy hawkweeds are in the United States and Canada. Two species are easily recognized. Orange hawkweed (*Hieracium aurantiacum*) (Figure 2) has bright orange flowers, and mouse-ear hawkweed (*H. pilosella*) has a single, yellow flower. Mouse-ear hawkweed is found only in coastal Washington and Oregon (For more information on mouse-ear hawkweed, see PNW409).

Other hawkweeds have multiple, yellow flowers and are difficult to distinguish from one another. They are known as meadow hawkweed (*H. pratense*) (Figure 3), yellow-devil hawkweed (*H. floribundum*), and king-devil hawkweed (*H. piloselloides*).

Fig 1. Meadow hawkweed infestation.

Fig 2. Orange hawkweed.



Hawkweed infestation in the Pacific Northwest.

Hawkweeds are notorious for their complex and confusing classification. Species are difficult to distinguish because they interbreed freely, and many of our hawkweeds look like hybrids. For the purpose of this bulletin, these yellow-flowered hawkweeds will collectively be called meadow hawkweed.

The authors—Robert H. Callihan, Linda M. Wilson, Joseph P. McCaffrey, and Timothy W. Miller

Once established, hawkweed quickly develops into a patch that continues to expand until it covers the site with a solid mat of rosettes. Forage species in pastures and abandoned farmland are choked out by the advancing front of hawkweed. Hawkweeds can pose a serious threat to native plant diversity. Hawkweeds threaten lawns and gardens, too. Many times orange hawkweed will escape from the gardens they are planted in, spreading into lawns, adjacent fields, and roadsides.

Distribution

Until recently, hawkweeds were found only in the eastern United States and Canada where they are troublesome weeds in pastures, abandoned farmland, and mountain meadows. Orange hawkweed was first recorded in Washington in 1945 and is now widely distributed in the Northwest. It owes much of its spread to its cultivation in gardens where it escapes into neighboring fields, roadsides, and farmland. Orange hawkweed seems to spread more slowly than meadow hawkweed but it nonetheless has formed large infestations in certain areas like Idaho's Bonner County, and Montana's Flathead County.

Meadow hawkweed was first recorded in Spokane County, Washington, in 1969. It has reached its greatest abundance in northern Idaho, with the largest infestations in Benewah, Kootenai, and Bonner counties. In Washington, meadow hawkweed is rapidly spreading in the northeastern counties of Okanogan, Ferry, Stevens, Pend Orielle, and Spokane. Infestations of meadow hawkweed were recently identified in western Washington in Skagit, Snohomish, and Whatcom counties.

In Montana, meadow and orange hawkweeds are spreading in several northwestern counties with the largest infestations in Flathead, Lincoln, and Sanders counties. King-devil hawkweed was recently found in Glacier National Park. Oregon does not report a major problem with hawkweeds, but the state has areas susceptible to hawkweed invasion.

Across the United States and Canada, introduced hawkweeds are associated with oxeye daisy, Canada goldenrod, dandelion, goatweed, cinquefoil, Canada bluegrass, and Kentucky bluegrass. In the Inland Northwest and in the wetter, coastal region of the Northwest, hawkweeds live predominantly in permanent pastures and hayfields, mountain meadows, clearings in forest zones, roadsides, and abandoned farmland at elevations of 2,100 to 5,400 feet. Introduced hawkweeds are not expected to become a problem in any dry habitat usually associated with Intermountain West rangelands. Hawkweeds prefer soils that are well-drained, coarse-textured, and moderately low in organic matter. Although they can grow in open woodlands, they do not tolerate shade very well.

Identification

A basal rosette of hairy leaves with several cord-like runners (stolons), and slender flower stems with a terminal cluster of small, dandelion-like flowers identify the invasive hawkweeds. The narrow, spatula-shaped leaves are 4 to 6 inches long, dark green above, and light green beneath. Plants vary considerably in the type and amount of hairs on the leaves. Each rosette produces from two to eight flower stems that are 10 to 36 inches tall. Stems have short, stiff hairs, contain a milky sap, and may have one to three small, clasping leaves below the midpoint of the stem. Each inflorescence consists of five to thirty bright yellow (or orange in the case of orange hawkweed) flower heads, from 1/2 to 3/4 inch in diameter. Heads contain all ray flowers arranged in a flat-topped cluster (Figure 4). The twelve to thirty tiny black seeds are ribbed and have a tawny tuft of bristles on the flattened end (Figure 5).

Stolons (Figure 6) begin to grow from buds in the axils of rosette leaves only when plants begin to flower. Depending on the growing conditions, plants produce from four to eight leafy stolons that can reach lengths of 4 to 12 inches. Most stolon tips develop into small, daughter rosettes that become the next generation of plants.

Many native hawkweed species grow in the United States and, except for white hawkweed, all have yellow flowers. Native hawkweeds differ from the introduced hawkweeds because they lack stolons and have numerous, upper stem leaves and a branched, open, flower arrangement. In addition, native hawkweeds are not weedy.

Biology & ecology

Hawkweeds are perennial herbs with fibrous (not tap) roots, that reproduce by seeds, stolons, rhizomes, and, in some cases, buds on the roots. Seeds can be produced either with pollen (sexually) or without pollen (asexually). Although most new hawkweed infestations are probably started by seeds, most established populations expand vegetatively. Studies in Ontario, Canada, showed that once meadow hawkweed gains a toehold at a new site, less than 2 percent of the plants in the patch come from seedlings. Once established, vigorous stolon growth quickly expands the colony, forming dense patches that can have as many as 3,200 plants per square yard. The slender, leafy stolons elongate through the summer and form daughter rosettes at their tips. As roots anchor these young rosettes, the stolons die and the young plants become independent of the mother plant. Hawkweeds regrow each year from short, below-ground rhizomes, which actually look like small root crowns.

Plants require a certain number of daylight hours per day in order to flower. At lower elevations this occurs around mid-June. Seeds ripen by early August. Fall-germinated seeds generally perish during the first winter, so most seedlings establish in the spring. Studies in eastern Canada showed that seeds are not carried far by the wind. Minute barbs along ribs on the seeds enable them to stick to hair, fur, feathers, clothing, and vehicles and be carried long distances.

Control

Early detection and eradication are important to prevent new infestations of orange and meadow hawkweeds. Eradicate small infestations by carefully digging out the shallow-rooted rosettes. When digging or cutting rosettes, avoid scattering the stolons, rhizomes, and roots. Plants quickly regrow from stolon and rhizome fragments, and from buds on scattered roots. In lawns, mowing does not kill the weeds because the low-lying leaves are missed by the mower blades. Although mowing prevents seed production by removing flower stems, repeated mowing encourages faster vegetative spread. Proper care of lawns with irrigation and fertilization will usually control the hawkweed. Hawkweeds do not persist in cultivation because crops can outcompete hawkweeds, especially where herbicides are used in the cropping system.

Where perennial grasses, legumes, and other beneficial broad-leaved plants are mixed in with the hawkweed, fertilizers can help control hawkweed by increasing the competitive ability of more desirable species. This is particularly true on range and pastures because these lands are generally not priority areas for supplemental fertilization and soil nitrogen levels may be inadequate for optimal grass health. Depending on soil productivity and grass condition, a single nitrogen application may be sufficient for grasses to competitively suppress hawkweed growth for 3 to 5 years. Good grazing management will extend this period.

Spring treatments with both herbicide and nitrogen fertilizer appear to be the best treatment for hawkweeds. Fall fertilizer applications are not recommended because excessive nitrogen loss through leaching will occur during the winter.

Selective herbicides are effective in controlling hawkweed if used properly. For chemical control recommendations, refer to the *Pacific Northwest Weed Control Handbook*, an annually revised publication available from the extension offices at University of Idaho, Washington State University, and Oregon State University.

Biological control uses the plant's natural enemies such as insects, mites, nematodes, and pathogens to control the weed. The feeding action of insects weakens the plant and hampers its competitive ability to invade new sites. There are many examples where biological control of weeds has been effective, for example, knapweed, yellow starthistle, goatweed (St. Johnswort), and leafy spurge. Biological control for hawkweeds is a new program still in development, so biocontrol agents are not currently available. However, hawkweed studies now being conducted in Europe will determine which insects and/or pathogens will specifically attack only the invasive hawkweeds and not native species and other valuable plants. These biocontrol agents will be introduced only after proven to be safe.

Long-term hawkweed management in the western United States requires careful implementation and integration of a host of management

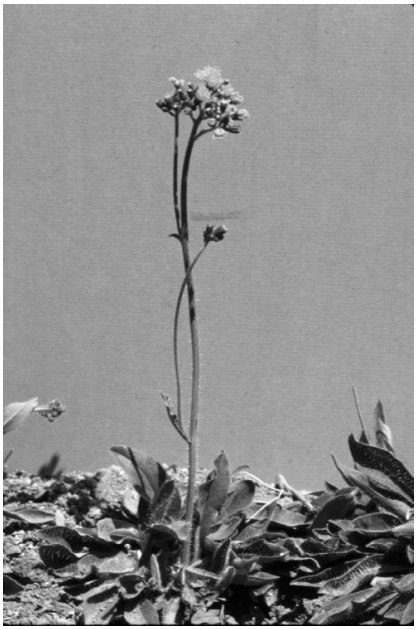


Fig 3. Meadow hawkweed.

Fig 4. Meadow hawkweed flowers.

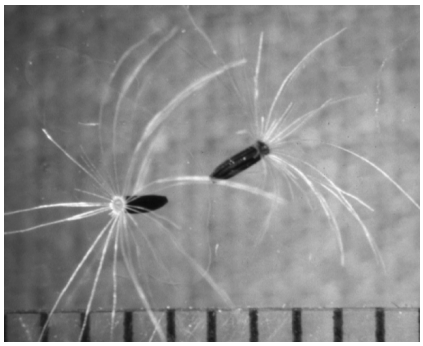


Fig 5. Meadow hawkweed seeds with tawny bristles.

Fig 6. Meadow hawkweed stolons enable rapid growth of large colonies.

and control strategies. These include not only herbicides, fertilizer, and biocontrol agents, but also managing grazing, limiting disturbance, early detection, and cooperation between private and public landowners.

About the authors

Robert H. Callihan is extension professor emeritus of weed science
Linda M. Wilson is research support scientist of entomology
Joseph P. McCaffrey is professor of entomology
Timothy Miller is Extension support scientist of weed science in the University of Idaho's Department of Plant, Soil and Entomological Sciences in Moscow.

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Published and distributed in furtherance of the Acts of Congress of May 8 and June 30, 1914, by the University of Idaho Cooperative Extension System, LeRoy D. Luft, director; the Oregon State University Extension Service, Lyla Houglum, interim director; and Washington State University Cooperative Extension, Harry B. Burcalow, interim director; and the U.S. Department of Agriculture cooperating.

July 1997 $1.00