FIREWEED

Chamerion angustifolium Holub

Plant Symbol = CHAN9

Fireweed (*Chamerion angustifolium*), Ben Legler, Burke Museum of Natural History and Culture, University of Washington

Alternate Names

Common Names: perennial fireweed, narrow-leaved fireweed, great willow-herb, rosebay willow-herb, flowering willow.
Scientific Names: Epilobium angustifolium, Chamaenerion angustifolium

Description

General: Evening primrose family (*Onagraceae*). Native, herbaceous perennial growing from spreading rootstocks. Plants are strongly rhizomatous with roots typically growing within the top few inches of the ground surface (Henderson et al. 1979). Fireweed has 1 to 6 ft., occasionally 9 ft., tall stout erect stems that are often reddish, usually unbranched and usually glabrous below and pubescent above with small white hairs. Leaves are willow-like, alternate (lower leaves often opposite), long-lanceolate, (2) 4 to 8 inches long, deep green above, paler beneath, pinnately veined, with conspicuous veins on lower surface and united near the leaf margins. Leaves are minutely and distantly toothed, or nearly entire, the lower narrowed into short petioles.
Fireweed blooms from June to September and has magenta, deep pink or rose-colored (rarely white) flowers. Flowers have 4, 0.35 to 0.80 inch long petals which are obovate in shape and taper to a short claw. Each flower has 4 narrowly lanceolate, spreading sepals, 8 stamens, a 4-cleft stigma, a style that is hairy near base and longer than the stamens, and a 4-loculed ovary. Flowers have long pedicels and are borne in long terminal spikes, racemes, or in the axils of upper foliage leaves. Fireweed fruit is a slender, many seeded capsule. Seeds have a tuft of fine white hair at tip (Myerscough 1980; Broderick 1990; Hitchcock & Cronquist 1973; Gilkey and Dennis 1980; Mitich 1999; Stubbendieck et al. 2011).

Distribution: Fireweed grows in northern climates throughout the world. It tolerates a broad spectrum of climatic conditions (Mosquin 1966). It has been recorded from 25 to 70 degrees north, and from sea level in the central and northern parts of its range in Western North America to 15,000 ft. in the Himalayas. Fireweed is widespread in the northern US and Canada from Labrador to Alaska. In America its distribution extends south along the eastern mountain chain into N. Carolina (Myerscough and Whitehead 1966) and in the west down the Cordilleran range into California and New Mexico. In the southerly limits of its range, distribution is restricted to montane environments (Mosquin 1966). For current distribution, please consult the Plant Profile page for this species on the PLANTS Web site.

Distribution of fireweed at the southern edge of its range is limited by water requirements, and in the northern most part of its range distribution appears to be restricted to relatively sheltered sites where plants are not exposed to the effects of cold, drying winds (Myerscough and Whitehead 1966).

Habitat: Fireweed can be found in a wide variety of environments but is most frequently associated with species colonizing recently disturbed ground (Dyrness 1973). Habitats in which fireweed grows include burned or logged forests, woodland boarders, forest meadows, alpine meadows, mixed forests, boreal forests, roadsides, and moist areas along streams, lakes and bogs (Gilkey and Dennis 1980; Bartos and Mueggler 1981; Myerscough and Whitehead 1966). In some well-established plant communities, widely spaced fireweed colonies with low stem densities may persist for long periods (Moss 1936).

Adaptation

Fireweed is predominately an early successional plant and is named fireweed because of its tendency to grow where fires have occurred (Mitich 1999). It is adapted to fire because of its rhizomes and prolific production of wind-

dispersed seed. It is a notably adaptable species that is capable of growth and survival in a wide range of plant communities and successional stages (Henderson et al. 1979). Fireweed is adapted to disturbances that reverse succession, such as logging and wind throw (Dyrness 1973; Bartos and Mueggler 1981). *C. angustifolium* colonies, through the development of an extensive and long-lived system of shallowly buried roots, can persist for many decades in areas of mature forest where no evidence is found for continuing recruitment of seedlings. Fireweed cover often decreases with decreasing sunlight (Lieffers and Stadt 1994). After severe disturbance of the forest cover, fireweed colonies go through a phase of prodigious root growth and the density of shoots increases (Henderson et al. 1979).

Fireweed can grow on a wide variety of substrates. However, it does not appear to occur in conditions of poor mineral nutrition and does not tolerate waterlogged soils. It is tolerant of acid as well as neutral and fairly alkaline soils (Myerscough and Whitehead 1966) and grows well in potash (Mitich 1999). In the artic, fireweed is a dominant natural colonizer of oil spill sites and has been found on acidic coal spoils, mine wastes, and along road cuts (Mosquin 1966).

Diploid forms of the plant are common in Europe and the northern part of North America while polyploids are distributed throughout the southern part of the continent of North America (Henderson et al. 1979). Although mixed-ploidy populations of fireweed are common in North America, tetraploid plants occupy a drier climatic niche than diploids. Pure diploid populations occur in habitats that are colder than those of pure tetraploid populations (Thompson et al. 2014).

Uses

Wildlife Habitat: Fireweed is valued as food for wildlife. In some areas, shoots of fireweed are a preferred food of deer and cattle and are also eaten by moose, caribou, muskrat, and hares (Willms et al. 1980; Henderson et al. 1979).

Pollinator Habitat: A broad spectrum of insects utilize fireweed (Myerscough 1980). Swales (1979) observed eight different species of bees and several fly and bug species utilizing fireweed. Nectar is produced continuously beginning about one day after anthesis and ending when abscission of floral parts occurs, a process which in fertilized flowers normally requires about four or five days (Mosquin 1966). Bees are the most abundant pollinators of fireweed (Kennedy et al. 2006) and in much of Canada it is an important plant for the honey industry (Mosquin 1966).

Landscaping: Fireweed is sometimes grown as an ornamental but it is apt to become a bothersome weed (Parish et al. 1996).

Reclamation: Fireweed shows great potential for use in forest reclamation as it is capable of germinating and growing on reclaimed soils. It is effective in taking up nutrients from the soil, promoting nutrient capture, accumulation, and likely nutrient cycling on newly reclaimed sites (Pinno et al. 2014).

Ethnobotany

Fireweed has been utilized in several ways by Native Americans and First Nations People. Many sought out fireweed plants in the spring-time before they bloomed, to eat the sweet and succulent raw pith of the stems. Some boiled or steamed the stems and served them like asparagus, some used the leafy stems as flavoring or as matting in root-cooking pits or earth ovens (Turner 1997). In England and Russia the leaves were used as a substitute for, or an additive to, tea. In Russia it is still used for this purpose; the beverage is called “Kaporie tea” (Mitich 1999).It may have a laxative effect (Parish et al.1996).

Fireweed was used by Interior Peoples (Canadian First Nations People) externally as a medicine against eczema, and they sometimes mixed it with other plants. Coastal First Nations People dried stems peelings and twisted them into a type of twine used for fishing nets. Some mixed the seed fluff with hair from mountain goats or dogs and used it for weaving or padding (Parish et al. 1996). Extracts of fireweed reduce PG (prostaglandin) biosynthesis and exert anti-inflammatory effects (Juan et al. 1988). More recently, Japanese-Canadians and others have adopted fireweed as a green vegetable (Turner 1997).

Status

Although widespread across much of Canada and the northern US, in some areas at the southern extent of its range fireweed is a rare species. In the states of Indiana, Ohio and North Carolina fireweed is classified as a Threatened or Endangered species and in Tennessee, because of its rarity, it’s classified as a Species of Concern.

Fireweed is particularly abundant on recently disturbed ground in coniferous or mixed forest ecosystems and is a common weed of roadsides and waste areas. Where growth is prolific, seedling establishment of commercially important coniferous trees can be suppressed (Broderick 1990). Fireweed can be a problem in perennial crops.

This plant may become weedy or invasive in some regions or habitats and may displace desirable vegetation if not properly managed. Please consult with your local NRCS Field Office, Cooperative Extension Service office, state natural resource, or state agriculture department regarding its status and use.

Please consult the PLANTS Web site (http://plants.usda.gov/) and your State Department of Natural Resources for this plant’s current status (e.g.,

threatened or endangered species, state noxious status, and wetland indicator values).

Planting Guidelines

Fireweed seeds are very small and difficult to plant when the pappus is still attached. In a greenhouse study, seeds had a higher germination rate when sown on the soil surface than when sown at a depth of 1/12 inch or more (Myerscough and Whitehead 1966). The highest rates of germination were obtained when seeds were sown on the surface under warm well lighted humid conditions (Myerscough and Whitehead 1966).

For outdoor plantings, seed should be broadcast or drilled with the drop tubes disconnected at the openers to allow seed to land on the soil surface or be only slightly buried. Seed should be mixed with other seed or a carrier, such as rice hulls, to facilitate flow through a drill. The ideal planting time for fireweed is in early fall, to allow germination and growth before winter, or late fall before the snowfall for a dormant seeding (Gilmore, personal com.). Hydroseeding has been shown to be an effective method for seeding fireweed (Gilmore, personal com.).

Pests and Potential Problems

Fireweed is alternate host of the rust *Pucciniastrum Abieti-chamenerii* (*Pucciniastrum epilobii*) that causes needle rust in *Abies balsamea*. The rust fungus *Puccinia gigantean* parasitizes *C. angustifolium*. Major infestations are reported to cause reduction in flowering, premature senescence of the shoot and even death of the entire plant (Henderson 1979).
C. angustifolium was found to develop leaf lesions when exposed to *Phytophthora ramorum*, the cause of sudden oak death on the U.S. West Coast (Shishkoff 2012).

There are also a variety of leaf eating insects associated with *C. angustifolium* (MacGarvin 1982).

Environmental Concerns

Seedling establishment of commercially important coniferous trees can be suppressed in areas where fireweed growth is prolific, and the species can be a problem in perennial crops (Broderick 1990). *C. angustifolium* may act as a reservoir for root-rotting Armillaria spp., a serious problem for lodgepole pine (*Pinus contorta*).

Control

Livestock grazing early in the spring and again in the fall can reduce *C. angustifolium* populations (Ingram 1931). To prevent spread in a home garden, collect seed from plants before the seeds are able to spread to areas where *C. angustifolium* is not wanted (Gilmore, personal com.).

For other control methods contact your local agricultural extension specialist or county weed specialist to learn what works best in your area and how to use it safely. Always read label and safety instructions for each control method. Trade names and control measures appear in this document only to provide specific information. USDA NRCS does not guarantee or warranty the products and control methods named, and other products may be equally effective.

Seeds and Plant Production

Fireweed plants are protandrous (male reproductive organs mature before the female reproductive organs) and self-compatible (capable of self-fertilization) (Mosquin 1966). Flower anthers open, and disperse pollen, within 24 hours of the flower opening while the stigmas remain closed and the style (connects stigma to the ovary) strongly reflexed away from the anthers for 2 to 3 days, a process that promotes cross-pollination (Mosquin 1966). After most of the pollen of a flower is shed, the stigma comes forward while the anthers become deflexed. The stigma opens and now may be pollinated (Mosquin 1966).

Collect fluffy seeds by hand in late summer just prior to dispersal. Flowering progresses from the base to the top of the plant, so the first-formed lowermost capsules may be ripe and their seeds dispersed by the end of July, while flower buds are still being produced at the apex of the shoot. Fireweed seeds are small (approx. 6,800,000/lb.) (Wiese et al. 2012), grey to black, and embedded in white hairs.

Fireweed is a challenge to clean due to the tiny seed and the silky hairs that aid in wind dispersal, which makes this seed "flighty" and difficult to feed into the brush machine (Barner 2009). Large collections can be cleaned with a hammermill and air column separator. Small collections can be cleaned by rubbing the achenes over a screen to separate the pappus from the achenes (Luna and Dedekam 2008; Gilmore, personal com.).

Barner (2009) developed a successful method of cleaning the seed that involved using a laboratory brush machine with a #40 mantel at medium speed to remove seed from the capsules and to remove the silky hairs. Barner then used laboratory test sieves mesh size 50, 40, and 20 to remove non-seed material before air-screening the seed with an Office Clipper®. The Office Clipper® was had a top screen of40 x 40 wire and a bottom screen of50 x 50 wire, at low speed and low air.

Seeds stored at 34 – 37° F in sealed containers remain viable for at least a few years (Luna and Dedekam 2008). Most seeds will germinate within 10 days when exposed to warm, moist conditions (Jobidon 1986).

New shoots arise each spring from buds formed late in the previous growing season, along an often complex network of horizontal roots. Cuttings from these roots are suitable for transplanting (Mitich 1999).

Cultivars, Improved, and Selected Materials (and area of origin)

No known cultivars or selected materials.

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Citation

Fleenor, R., 2016. Plant Guide for Fireweed (*Chamerion angustifolium*). USDA-Natural Resources Conservation Service, Spokane, WA 99201

Published/Edited January 2016

Edited: 1Jan2016 plsp; 14Jan2016 ac; 19Jan2016 plsp

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