

Agronomy Advice

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Wild Parsnip

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Wild parsnip is a nonnative, invasive plant that is rapidly increasing in many areas of Wisconsin. This plant, native to Europe and Asia, is in the Umbelliferae family (also known as the Apiaceae family or in common terms, the parsley or carrot family) and is believed to have been introduced as a vegetable plant as the taproots are edible. As wild parsnip has spread within Wisconsin, so has the realization that human exposure often leads to serious burns and blisters on the arms and legs. Being able to readily identify wild parsnip will minimize inadvertent and excessive exposure to this plant and the often painful results that follow.

During much of July, wild parsnip is one of the dominant yellow-flowered weeds in many roadsides and other right-of-ways, fence rows, prairie restorations, CRP sites and poorly managed pastures. Plants are most abundant in sites dominated by perennial grasses that are mowed once or twice annually.

Description. The seedling leaves are small and ovate while the first true leaves are arranged in spiral fashion, forming the typical rosette observed in the first year of growth. Fully developed rosettes have 10 to 15 pinnately compound leaves with broad ovate to oblong leaflets. When plants flower they produce a stout, smooth, hollow, grooved flower stalk that can reach 5 feet in height. Leaves on the stem are alternate and have 2 to 5 pairs of opposite, sharply toothed leaflets. The petioles are broad and the base of each leaf stalk completely encircles the stem. The top most stem leaves are reduced to narrow bracts and the flowering branches arise from their axils. Flowers have five small petals that are clustered in umbels that are 4 to 8 inches in diameter. Seeds (mericarps) are flattened on one side to round and have five ribs.

Life Cycle and Growth. Plants require a cold period (winter) after germinating before they flower, but not all vernalized plants flower the next summer. After a plant flowers, it dies. Most plants flower in the second, third or fourth season after germination (Baskin and Baskin, 1979). When a given plant flowers is determined by the size of the rosette. Plants that reach the critical size by the end of the growing season will be vernalized during the winter and flower the following spring. The critical size was found to be best determined by the root crown diameter with plants < 5 mm (0.125 inches) not flowering.

Plants form primary umbels on the top of the main stem, with secondary and tertiary umbels produced as side shoots from the main stalk. Flowering and seed maturation occurs within a two week period between primary, secondary and tertiary umbels.

Most seeds are dispersed from the parent plant by the end of September and germination occurs from this time through November and again in the spring (Hendrix and Trapp, 1989). Wild parsnip has a long germination period, but the optimum time for germination is in the early spring (Baskin and Baskin, 1979). It is believed that most fall germinated seedlings die during winter.

Why the explosion of wild parsnip in Wisconsin? Birds and small mammals eat the seed and likely spread them from site to site. There is no doubt that the delay in mowing roadsides until mid summer as an official roadside management policy of the state opens the door for this plant to complete its life cycle and produce ripe seeds well before any mowing is done. Also, when roadsides and pastures are mowed in late July and August, parsnip seeds probably move as hitchhikers on the mowers. Mowing also creates a much more favorable environment for parsnip seeds to germinate than if the sites were left undisturbed. Relatively mild winters may enhance survival of wild parsnip plants that germinate and become established in the fall.

Health concerns. This section is adapted from the excellent article on wild parsnip burns by David Eagan (1999). Wild parsnip is of concern because humans develop a severe skin irritation from contact with its leaves. Plants have chemicals called psoralens (more precisely, furocoumarins) that cause phyto-photodermatitis: an interaction between plants (phyto) and light (photo) that induce skin (derm) inflammation (itis).

Once the furocoumarins are absorbed by the skin, they are energized by uv light on both sunny and cloudy days. They then bind to DNA and cell membranes, destroying cells and skin. Wild parsnip burns usually occur in streaks and elongated spots, reflecting where a damaged leaf or stem moved across the skin before exposure to sunlight.

Wild parsnip burns differ from the rash caused by poison ivy in several aspects. First, everyone is sensitive to wild parsnip and you do not need to be sensitized by a prior exposure to develop burns or blisters. You can brush against wild parsnip plants and not be affected. Parsnip is only dangerous when the plant sap from broken leaves or stems gets on your skin. Lastly, the wild parsnip's "burn" is usually less irritating than poison ivy's "itch." The worst of the burning pain caused by wild parsnip is usually over within a couple of days while the rash and itch of poison ivy can last a long time.

In cases of mild exposure to wild parsnip, affected areas turn red and feel sunburned. In severe cases, the skin first turns red and then blisters. The arms, legs, torso, face, and neck are most vulnerable and affected areas may feel like they have been scalded. Blisters form a day or two after sun exposure and soon after the blisters rupture and the skin starts healing. But for many people the ordeal is not over as dark red or brownish "scars" remain in the burned areas for several months to years. Animals can also get parsnip burns if they have little hair and lightly pigmented skin, characteristics that allow the chemical and sunlight to reach the skin.

The burning sensation can be relieved by covering affected areas with a cool, wet cloth. Try to delay blisters from rupturing as long as possible as blisters protect the skin by keeping it moist and clean while the areas heal. For those cases with extensive blistering, consult a doctor.

Tips to avoid exposure include wearing gloves, long pants, and long-sleeved shirts. Planning control activities for the early evening will minimize sunlight and thus activation of the blistering process. If you are exposed to the plant juice, wash the contaminated areas thoroughly as soon as possible.

Control. Plants can be controlled with several different management methods, and selecting the most appropriate method(s) is dependant upon the site that is infested. Below is a summary of physical, biological and herbicidal methods of control. Remember, integrated approaches that utilize multiple strategies are often the most successful.

Physical methods. Any operation that results in severing of the root below the root crown will kill wild parsnip plants. This can be done by hand pulling plants or by slicing below the crown with a shovel. Mowing plants is effective at preventing seed production if conducted at the appropriate time (bolting to flower bud stage), but if flowers or fruit (seeds) are present mowing may facilitate further spread of this species.

Biological control. There are no planned biological control programs in Wisconsin but the parsnip webworm often destroys many wild parsnip inflorescences. Grazing animals have also been observed to readily graze wild parsnip and prevent it from establishing.

Herbicides. Herbicides can effectively manage wild parsnip if applied correctly at the appropriate stage. Herbicides can be treated as a spot spray application or broadcasted depending upon the size and pattern of the infestation (consult the label for specific information on application methods). If possible plan on spring or fall applications to rosette plants as results are typically the best and damage to desirable plants can be minimized. Herbicides with the active ingredients 2,4-D or metsulfuron have all been documented to have good to excellent activity on rosette plants while providing minimal damage to grasses. Careful applications of glyphosate will also kill wild parsnip plants, but will also injure nearby vegetation contacted with the spray solution. By the time plants are bolting or flowering, treatments may have reduced success.

Table 1. Herbicides known to be effective on wild parsnip.

Active ingredient	Product name	Spot trt rate	Broadcast rate
2,4-D*	many	1% solution (v:v)	1-4 pts/A
Glyphosate*	many	2% solution (v:v)	Varies by product, read label (0.5-1.0 lbs acid equivalent/A)
Metsulfuron*	Escort, Cimmaron	1 oz per 100 gal	0.3-1.0 oz/A

* addition of a surfactant at 0.25-0.5% (v:v) is recommended

References

- Baskin, J.M. and C.M. Baskin. 1979. Studies on the autecology and population biology of the weedy monocarpic perennial, *Pastinica sativa*. *J. Ecology*. 67:601-610.
- Eagan, D.J. 1999. Burned by wild parsnip. *Wisconsin Natural Resources Magazine*. (Published by the Wis. Dept. of Natural Resources) June issue.
- Hendrix, S.D. and E.J. Trapp. 1989. Floral herbivore in *Pastinica sativa*: Do compensatory responses offset reductions in fitness? *Evolution* 43: 891-895.

Fig. 1. A wild parsnip flowering plant, inflorescence and rosette

