

APRIL 2006

STEVE'S Weed of the Month

Poison Hemlock

Poison Hemlock is a **Class C Weed**. The Class C status allows counties to enforce control if locally desired. Other counties may choose to provide education or technical consultation.

Poison hemlock (*Conium maculatum* L.), is a native of Europe, western Asia and North Africa. It was imported from Europe as a garden ornamental. It now occurs in nearly every state in the United States and southern Canada, including the majority of the counties of the western United States. The toxicity of poison hemlock has been known throughout history. In ancient Greece it was used to poison political prisoners. Perhaps the most renowned prisoner to die from the plant was the Greek philosopher Socrates in Athens in 339 B.C. Hemlock is also thought to be given to Christ along with vinegar and myrrh when he was crucified. Native Americans once used hemlock toxins to poison the tips of their arrows. Poison hemlock has also been used in positive ways such as the treatment of tumors, ulcers, and gout. The most recent human deaths have resulted from mistaking poison hemlock with edible species of the carrot family.



Identification: Poison hemlock is a member of the parsley family, Apiaceae. It is a biennial herb that can grow 3 to 8 feet tall and occasionally reach 10 feet. During the first year of growth, poison hemlock forms a large rosette and usually remains in the vegetative stage. During the second year, it produces tall stems and then flowers.

The weed is extensively branched, with an erect stem with distinct ridges. Its stems are hollow, except at the nodes, (the points where the leaves attach). The stems are purplish in color with the lower portions of the stems containing purple spots.



Poison hemlock leaves are highly dissected resembling those of a fern. The leaves are alternately arranged on the stem, dividing three to four times. Poison hemlock leaves are pinnately compound, meaning that each leaf is made up of several pairs of leaflets that sprout from opposite sides of a main leaf stalk. Poison hemlock can also be characterized by its rank, pungent odor when one is near the plant or has crushed the leaves or stem.

Flowering occurs in July and August. The flowers are white and arranged in umbrella-like clusters. Poison hemlock reproduces solely by seeds. Seeds are paired, 1/8 inch long, light brown, barrel-shaped capsules with conspicuous longitudinal ribs (Picture 1). Seeds often drop next to the parent plant and regenerate, forming dense stands of the invasive plant. Seeds ripen in August and September, drop next to the parent plant, and regenerate forming dense stands. The seeds can also be spread by farm equipment, animals, clothing, and water. Poison hemlock seeds are relatively short-lived (three years).



Poison hemlock can invade perennial crops like alfalfa, but it is only a significant problem in the first cutting, because subsequent regrowth of alfalfa can suppress poison hemlock. Poison hemlock is a common invader in grazed areas but can contaminate crops. It tends to grow in moist pastures and meadows where it has the potential to out-compete more desirable native species. Perhaps the largest impact of a poison hemlock invasion is its toxicity to livestock.

Misidentification of poison hemlock with other members of the carrot family is common and can be deadly. One distinguishing characteristic between poison hemlock and wild carrot is the lack of hairs on the leaves and stems of poison hemlock. Cow parsnip differs from poison hemlock by its palmately compound leaves unlike the pinnately compound leaves of hemlock.

All parts of the plant are extremely poisonous. The lower portions of the stem and root are particularly deadly. Environmental factors can alter the alkaloid composition and concentration. Of the eight known alkaloids in poison hemlock, the principle toxins are the piperidine alkaloids coniine and coniceine. Coniine is more common in the seed and in mature plants, but coniceine makes up 98% of the total alkaloids in the early vegetative stage. Coniceine is eight times as toxic as coniine. These two principle alkaloids affect the reproductive system and the central nervous system of animals.

All classes of livestock and wildlife are affected by the toxins of poison hemlock. Cattle, goats, and horses are the most susceptible domesticated animals because they are least able to metabolize the toxic agents. Symptoms of poisoning can occur within 30 minutes to 2 hours, depending on the animal, and include trembling, muscular weakness, loss of coordination, dilation of pupils, a weak and slow heartbeat, coma, and eventually death from respiratory paralysis. Poison hemlock can cause fetal deformation if a pregnant animal eats the plant. Toxins can pass into the milk of an animal, affecting the offspring, and in the case of dairy cattle can affect the safety of milk that humans consume. To reduce livestock exposure to poison hemlock's toxins, prevent grazing when the plant is the only available green forage.

Management

Prevention: It is important to prevent the expansion of poison hemlock from small-scale to large-scale infestations. If you discover poison hemlock on your property you should map and monitor areas of current populations and continually scout for newly established plants. To prevent seeds from spreading along the waterway, minimize soil disturbance. Eradicate new infestations of one to a few plants immediately (preferably before the plant sets seed) by hoeing or spot-applying herbicide.

Biological Control: The hemlock moth (*Agonopterix alstroemeriana* (Clerck)), may offer possibilities for biological control of poison hemlock. Although it is not known how the insect was introduced to the United States, the hemlock moth has become widely dispersed. The only known host plant in Europe and the United States is poison hemlock. The moth larvae feed on the poison hemlock foliage, buds, immature seeds, stem tissues, and flowers in the spring and early summer. When several hundred larvae attack one plant it may be completely defoliated. The larvae also can influence seed production. Adult moths emerge in summer and consume some foliage but the larvae are the most effective. Collection and redistribution of the adult or larval stage is relatively easy and accomplished by clipping infested foliage and distributing the material among uninfested poison hemlock. The success of the hemlock moth in controlling poison hemlock is highly variable.



Chemical Control: Several herbicides can be used to control the emergence of poison hemlock sprouts. The sulfonylurea herbicides, chlorsulfuron (Telar®) and metsulfuron (Escort®), all provide excellent pre-emergence control.

To chemically control poison hemlock after the sprouts have emerged, you can use phenoxy herbicides or glyphosate. Phenoxy herbicides such as 2,4-D (amine and ester formulations) and MCPA are the most effective if sprayed in the early spring after emergence. Approved aquatic formulations of glyphosate can be used to control plants near water.

Note: some of these active ingredients are only registered on a subset of the sites listed above.

Chemical treatment of poison hemlock may require repeated applications to deplete the seed bank. The length between applications depends on the herbicide. Once poison hemlock is depleted, it is important to implement proper grazing, fertilization, and irrigation management to promote the growth of desired species and to reduce the risk of reinfestation.

[More information can be found in the PNW Weed Management Handbook](#)

Use pesticides with care. Apply them only to plants, animals, or sites listed on the label. When mixing and applying pesticides, follow all label precautions to protect yourself and others around you. It is a violation of the law to disregard label directions. Store pesticides in their original containers and keep them out of the reach of children, pets, and livestock.

Mechanical Control: In croplands, plowing or repeated cultivation will prevent poison hemlock establishment. In other areas, repeated mowing can be used to remove the bolting plant material, reduce its competitive ability and prevent seed production.

Integrated Weed Management: Implementation of techniques such as biological control, herbicides, and revegetation could be used to control poison hemlock. Follow-up monitoring and management should always be implemented.

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