

HORSENETTLE

(Solanum carolinense)

SEEDLING DESCRIPTION

Horsenettle seedling stems (hypocotyls) are stout and erect, and are either entirely purple or green with purple tinges. Both the hypocotyl and the main stem above the seed leaves are densely covered with short, stiff hairs.

The two seed leaves (cotyledons) grow to ½ inch (12 mm) long and about half as wide. They are oval, glossy green on the upper surface, light green below, and smooth except for tiny hairs along the margins. The midvein shows as a depression on the upper surface and a ridge on the lower.

The first true leaves on young horse-nettle plants appear as a cluster. They are bright green above and pale green underneath. The first two leaves have sparsely hairy upper surfaces and smooth margins. Subsequent leaves develop wavy or lobed margins, hairy surfaces, and long yellow spines along their midveins. The leaf stems (petioles) are flat along the upper surfaces and are covered with stiff spines and fine hairs.



BIOLOGY

Horsenettle is a persistent perennial that reproduces by seed and by its extensive root system. It is not a true nettle but belongs to the Nightshade (*Solanaceae*) family, which includes potatoes, tomatoes, and eggplant.

The stems are either simple or multi-branched and grow 1 to 4 feet (30 to 120 cm) tall. They are covered with prickly hairs about ⅓ inch (3 mm) long and a scattering of sharp yellow or white spines ¼ to ½ inch (6 to 12 mm) long.

Leaves are alternately arranged, green, 1 to 7 inches (2.5 to 18 cm) long, and about half as wide. Margins are coarsely lobed, with one to four pairs of large pointed teeth per leaf. Leaf surfaces are rough, covered with tiny hairs, and have long spines on the midribs, veins, and petioles.

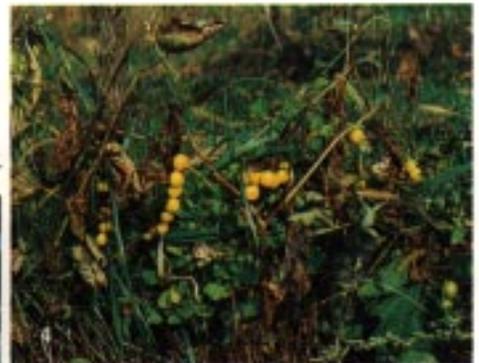
Horsenettle blossoms from May until September, with most of the flowers

blooming thirty days after the plants emerge. The star-shaped blossoms are about 1 inch (2.5 cm) across and look like potato flowers. The five petals are pointed and may be blue, violet, or white. The male and female flower parts together form a bright yellow conelike cluster in the center of each blossom.

Fruits are set about thirty days after flowering. They look like miniature tomatoes — smooth, juicy, round, and ⅓ to ⅜ inch (9 to 18 mm) in diameter. Green at first, they turn yellow when ripe and become wrinkled after drying. Inside the fruit, a foul-smelling pulp surrounds numerous flat, round, yellow seeds ⅓ to ½ inch (1.5 to 3 mm) across. The average number of seeds per fruit is about 85, and one plant may produce as many as 100 fruits.

Most of the seeds are dormant when shed from the plant. This dormancy is broken by an overwintering period, during

1. *Horsenettle spreads easily by seed.*
2. *Note spines along midveins and stems.*
3. *Horsenettle blossoms resemble potato flowers.*
4. *Dried plant is unwelcome in hay.*
5. *The tomato-like fruits turn yellow when ripe.*



which the gelatinous substance surrounding the seed washes off. Alternating temperatures from 68° to 86°F (20° to 30°C) are necessary for germination. Seedlings emerge best in light-textured, well-drained soil. They can emerge from as deep as 4 inches (10 cm), but optimum depth is between ½ inch and 2 inches (1.2 and 5 cm). Seeds are rarely carried far from the parent plant because birds avoid the poisonous berries, and the berries are too heavy to be windborne. However, seeds may be spread throughout the field by grazing animals, although livestock generally avoid eating horsenettle.

Horsenettle is a persistent weed because of its extensive perennial root system. The taproot often reaches 8 feet (2.5 m) into the soil. Roots in the upper 18 inches (45 cm) can extend 4 feet (120 cm) horizontally from the main plant. Horsenettle spreads more quickly in cultivated land than in undisturbed areas because tillage distributes pieces of root throughout fields. New plants can emerge from rootstocks buried 12 inches (30 cm) below the soil surface, and pieces of root less than ¼ inch long can produce a new plant. Buried root fragments have remained viable for ten years, sprouting when uncovered. No amount of disking and plowing seems to cut horsenettle roots small enough or bury them deep enough to suppress this determined weed.

SIMILAR SPECIES

White horsenettle (*S. elaeagnifolium*), also called silver-leaved nightshade, is similar in most respects to horsenettle, but it can be distinguished by the frosty white covering on its leaves.

NATURAL HISTORY

A native of the southern United States, horsenettle has spread as far north as Ontario, Canada. It grows throughout the United States except for the Great Plains region, and is most common in the middle eastern states. Thirty-seven states list horsenettle as a noxious weed.

Well-drained sandy or gravelly soils provide the best growing conditions for horsenettle. The weed's natural habitat includes fields, waste places, and gardens.

The Solanaceae family is named for "solanine," a poisonous compound produced by the plant. The word is derived from the Latin *solacium*, meaning "to relieve or console." Far from offering relief or consolation, eating plant parts that contain solanine can cause illness or death.

Children may find the bright yellow fruits attractive. According to medical records, eating the fruits has caused the death of at least one child. Fresh or dried horsenettle is poisonous to livestock, so farmers should learn to recognize the prickly leaves and stems in hay. Livestock can tolerate some horsenettle when it is dried and diluted with hay, but they generally do not eat the prickly, bitter weed if given a choice. However, since livestock losses have been attributed to horsenettle, allowing large amounts of the weed in hay or silage is not advised.

Solanine affects both the central nervous system and the gastrointestinal system. Symptoms include drowsiness, loss of sensation, difficulty in breathing, weakness, paralysis, unconsciousness, abdominal pain, inflamed mouth, vomiting, and constipation or diarrhea. Death results when the central nervous system becomes paralyzed and breathing stops.

Horsenettle hosts several enemies of its crop plant relatives, including leafspot fungus of tomatoes, verticillium wilt of eggplant, and mosaic virus of tomatoes and potatoes. It also attracts the potato flea beetle, the Colorado potato beetle, potato stalk borer, onion thrips, red spider mite, and the potato psyllid, a flea-like insect that transmits psyllid yellows disease.

Horsenettle is also called Carolina nettle. Other common names reflect the low opinion most people have of this weed: bull nettle, devil's tomato, devil's potato, and apple of Sodom.

CONTROL

Cultivation alone is unlikely to control horsenettle, and it may even create a worse infestation by chopping up the roots and spreading them over a larger area. Although the plants that emerge after cultivation are small and easy to control by systemic herbicides, the many root pieces remaining in the soil continue to emerge for years. Control is possible if herbicide applications are properly timed and combined with the right mechanical controls.

The most complete control of horsenettle is to mow at thirty-day intervals and treat the final regrowth in fall with a systemic herbicide. Rotating an infested field into grass or clover hay for one year allows this combination of treatments. Herbicides may also be applied the last year of an alfalfa stand.

The best time for the first mowing is right after horsenettle has come into full bloom, about thirty days after shoot emer-

gence. Four harvests are usually needed right after flowering, and forcing the plant to produce new top growth will further deplete its energy reserves. Continually cutting off the top growth during regular hay harvest will weaken the root system, making it more vulnerable to herbicides.

Systemic herbicides are effective against horsenettle and should be applied to mature plants in late summer or fall. After herbicide treatment, horsenettle should not be mowed for at least two weeks — the time required to translocate the chemicals into the roots. Similarly, fall herbicides should be applied at least two weeks before expected frost.

When horsenettle infests small grains, it should be allowed to grow until midsummer, when it will be in flower, and cut when the grain is harvested. After harvest, the horsenettle should regrow until early autumn and then be treated with a systemic broadleaf herbicide.

There are no chemical herbicides labeled for horsenettle in broadleaved forages, so pre-establishment control (during the previous year) is necessary.

In any row crop, spot-killing local infestations may be the best approach. Spot spraying or repeated mowing or pulling should eventually subdue patches of horsenettle. In waste areas or along roadsides, horsenettle should be mowed twice — thirty and sixty days after emergence.

In corn, post silage-harvest control works if corn is cut high enough and early enough to leave the weed still growing. After harvest, a systemic broadleaf herbicide can be applied to the horsenettle.

For specific recommendations, consult your county Extension agent or the most recent *Weed Control Manual and Herbicide Guide*, available through Meister Publishing Company, 37841 Euclid Avenue, Willoughby, Ohio 44094. Follow label instructions for all herbicides and observe restrictions on grazing and harvesting procedures.

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