

Weed Biology & Management

Biology and Management of Horseweed (*Conyza canadensis*) in Christmas Tree Production



DEBALINA SAHA, PH.D.
Assistant Professor
Ornamentals and Christmas
tree weed management
Department of Horticulture
Michigan State University



Figure 1. Horseweed growing in the Christmas tree field. Photo credits: Debalina Saha, Michigan State University.

Series for Christmas Tree Production

Horseweed (*Conyza canadensis* or *Erigeron canadensis*), commonly known as marestail, Canadian horseweed, Canadian fleabane, coltstail and butterweed is an important weed of Christmas tree production system. It is a summer or winter annual plant belonging to family Asteraceae. Horseweed originated and is widespread in North America and Central America and widely naturalized in temperate Asia, Europe and Australia (NatureGate; Vales-Ramirez and Altland, 2018). The plants are highly aromatic and may act as repellants for some insects.

Biology of Horseweed

Horseweed is found in wide range of habitats such as nurseries, Christmas tree production fields, landscapes, vineyards, perennial and small fruit horticultural crops, fields, pastures, canal banks and roadsides (Abbey, 2017). It can occur as summer or winter annual weed depending upon availability of favorable conditions (Vales-Ramirez and Altland, 2018). It usually germinates in fall or spring but can also germinate in midsummer if adequate growing conditions are present. Seeds germinated in fall, overwinter as rosette and begin to bolt and grow in spring. When growing as a winter annual, the rosette is produced in late summer (Abbey, 2017). Horseweed seeds can germinate year-round in soil temperatures higher than 55°F (Vales-Ramirez and Altland, 2018). It prefers full sunlight, can grow in all types of soil and can survive in drought as well as water-logged conditions (Boggs, 2016).

It forms a basal rosette for survival in unfavorable conditions, which bolts in the succeeding season, attaining a height of 1.5 to 6 feet (Loux et al., 2006). More the size of the rosette before onset winter, greater are the chances of survival in spring (Buhler and Owen, 1997). The plants have an upright growth habit and have a tendency to remain unbranched at basal part (Loux et al., 2006).

Horseweed as a summer annual, germinates in late fall or spring remains a rosette only for a short period before it bolts in early to late summer and flowers in end July (Fig 1). However, as a winter annual, it germinates in July-August with a tendency to remain rosette longer until next spring season, with just a few plants bolting and flowering in fall (Boggs 2016). Cotyledons or seed leaves are dull green, oval, may be hairless or short stiff hairs may be present, and are 1/10 inch (about 3 mm) long (Shrestha et al, 2008).

It has a fibrous root system with a shallow taproot that can be easily pulled off depending on the soil conditions (Abbey,

2017). Young horseweed plants produce low-growing rosette with hairy leaves. Once it bolts, it develops a single, erect, unbranched hairy stem (Fig 2) that has a dense coverage of simple, alternate leaves, 3-4 inches long, which may have entirely or slightly toothed margins (Fig 3). Mature plants have no petioles or stalks. Leaves near plant base are longer and toothed while those towards the top are progressively smaller in size (Shrestha et al, 2008).

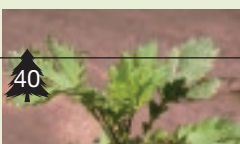
Horseweed produces numerous flowers on the stem ends or lateral branches (Shrestha et al, 2008). Inflorescence arranged in a panicle has a large number of white ray flowers measuring 1/16 to 2/16 inches and 20-40 yellow central disk flowers. As flower production progresses, older leaves on lower part of stem wilt and wither away (Loux et al., 2006). Because of the broom-like structure of flowers, it is commonly known as 'marestail' or 'coltstail'. Horseweed is self-pollinating as pollen is released before captula fully opens, however, 1.2-14.5 % outcrossing has been observed (Boggs 2016).



Figure 2. Unbranched hairy stem of Horseweed. Photo credits: Rob Routledge, Sault College, Budwood.org



Figure 3. Canadian Horseweed foliage. Photo credits: Bruce Ackley, The Ohio State University, Bugwood.org



Fruits are small, elliptical or oblong, about 1/16 inch (1.5 mm) long, narrow and slightly hairy (UC-IPM, 2016). Horseweed has an abundant seed production, producing up to 200,000 tiny (about 1mm) tan-colored seeds per plant, which are disseminated by wind to several hundred miles (Vales-Ramirez and Altland, 2018). The seeds produced are 1/16 to 1/4 inches in size, having a pappus of dirty-white bristles. The pappus is a facilitating structure for seed dispersal by wind. Seeds germinate readily after they fall off from mature plant (Boggs 2016).

Propagation of Horseweed is mainly by seeds.

Similar species

Hairy or flax-leaved fleabean (*Conyza bonariensis*) is a summer annual, which is found in similar habitats as horseweed, but can germinate at lower temperatures as compared to horseweed (Karlsson and Milberg 2007). The cotyledon leaves of hairy fleabean are gray-green, narrow, and crinkled. Plants have multiple lateral branching with narrower leaves having stiff hair. Plants are taller than horseweed at maturity (Shrestha et al, 2008). Annual fleabean (*Erigeron annuus*) is another similar species. In annual fleabean each tip of toothed margin of leaves has purple spots. The distance between nodes after bolting is greater as compared to horseweed. Also, fleabeans have more branching at plant base as compared to horseweed (Loux et al., 2006). Shepherd's-purse (*Capsella bursa-pastoris*) belong to mustard family and has opposite leaves at first node and alternate at subsequent ones. The hairs on leaves are shorter and present on upper surface of leaves as compared to hair present on margins of leaves in horseweed. The leaves of this plant are deeply lobes at later growth stages (Loux et al., 2006).

Management of Horseweed

1) Non-chemical Control: Prevention practices must be undertaken by Christmas tree growers which can include removal of any seedlings before they become mature and establish as perennial plants and prevent any plants from producing seeds. If topsoil is introduced to a site, it should be cleaned and free of roots, rhizomes, seeds and other bindweed propagules (Wright, 2011). Regular scouting for this weed need to be done by the growers in their fields, and immediate hand

removal is encouraged as later mowing in between the Christmas tree rows can spread the seeds and rhizomes easily.

2) Chemical Control: Preemergence Herbicides: Gallery 75 DF (isoxaben) can provide an excellent control of horseweed. Sureguard 51 WDG (flumioxazin), Westar 75 DG (hexazinone + sulfometuron methyl), Aatrex 4 L (atrazine) and Velpar 2 L (hexazinone) have shown a good control of horseweed in Christmas tree production systems as preemergence herbicides. However, Aatrex 4 L and Velpar 2 L are not recommendable as horseweed have shown resistance to triazines (Group 5) herbicides.

Postemergence Herbicides: Garlon 3 A (triclopyr) and Stinger 3 L (clopyralid) have shown very good control of horseweed as postemergent herbicides.

References:

Abbey, T. 2017. Horseweed—a Winter and Summer Annual. Penn State Extension. Retrieved October 22, 2020. <https://extension.psu.edu/horseweed-a-winter-and-summer-annual>

Boggs, J. 2016. THE WEEKLY WEED: Canadian Horseweed (*Conyza canadensis*). Hort Shorts, Buckeye Yard and Garden Online, The Ohio State University. Retrieved October 22, 2020. <https://bygl.osu.edu/node/534>

Buhler, D. D. and Owen, M. D. K. 1997. Emergence and survival of horseweed (*Conyza canadensis*). *Weed Science* 45:98-101.

Loux, M., Stachler, J., Johnson, B., Nice, G., Davis, V. and Nordby, D. 2006. Biology and management of horseweed. The Glyphosate, Weeds and Crops Series, GWC-9. Purdue Extension. Retrieved October 22, 2020. <https://www.extension.purdue.edu/extmedia/GWC/GWC-9-W.pdf>

NatureGate. *Canadian Fleabane: Conyza canadensis*™. Retrieved October 22, 2020. <https://www.luontoportti.com/suomi/en/kukkakasvit/canadian-fleabane>

Shrestha, A., Hembree, K. and Wright, S. 2008. Biology and Management of Horseweed and Hairy Fleabean in California. University of California Agriculture and Natural resources. Retrieved October 22, 2020. <https://anrcatalog.ucanr.edu/pdf/8314.pdf>

UC, IPM. 2016 University of California Agriculture and Natural resources, Statewide Integrated Pest Management Program. Retrieved Feb 2, 2021. <http://ipm.ucanr.edu/PMG/WEEDS/horseweed.html>

Vales-Ramirez, S and Altland, J. 2018. Learn how to combat glyphosate-resistant horseweed in field nurseries. Nursery Management. Retrieved October 22, 2020. <https://www.nurserymag.com/article/glyphosate-resistant-horseweed-control/>

Wright, S.D. 2011. Field Bindweed. Integrated pest management for home gardens and landscape professionals. University of California Agricultural and Natural Resources Pest Notes 7462: 1-4. 🌲