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# Identification and Management of Hairy Bittercress in Greenhouses

Hairy bittercress (*Cardamine hirsuta* L.) is an important weed species of container nurseries and greenhouse operations (Figure 1). It is an annual or biennial, dicotyledonous plant which belongs to the family Brassicaceae. It is native to the areas of Europe and Asia but has established itself worldwide. It has been introduced throughout many parts of the United States (USDA, 2019). *Cardamine hirsuta* is known by different common names such as hairy bittercress, spring cress, lamb's cress, winter bittercress, hairy cress, flick weed, wood cress, popping cress.



Figure 1. Hairy bittercress (*Cardamine hirsuta* L.) growing in a container, inside the greenhouse. Photo credits: Debalina Saha (Dept. of Horticulture, Michigan State University)

It is a winter weed but may appear throughout the year in greenhouses because of favorable growing conditions and continuous irrigation availability (Ryan, 1977). In addition to its common weediness, hairy bittercress is also known to be a host of many nursery insects such as mites and whiteflies and various pathogens of nursery plants. In this alert, growers will learn how to identify and manage hairy bittercress in their greenhouses.

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**Habitat:** Hairy bittercress occurs in a wide range of habitats such as, bare land, grasslands, woodlands, forests, croplands, wastelands, roadsides and in garden areas. It is able to grow in pieces of debris scattered over weed fabric in greenhouses, which helps spreading seeds to several feet, and infesting nearby containers (Altland, 2003). It proliferates well in partial to full sunlight, in moist fertile loamy or sandy soil in moderate temperatures, and when moisture availability is abundant. Hairy bittercress can also grow inside greenhouse conditions (Figure 2) in nursery pots and growing media as well (Marble et al., 2014).

**Growth Habit:** Hairy bittercress has a dense basal rosette initially (Figure 3).

Afterwards, flowers and seeds are borne on a vertical growing stem, making an upright growth habit. Sometimes, it may have prostate growth, which makes mowing operations difficult.

**Seedling:** The cotyledons of seedlings are small, round, yellowish-green, hairy and are borne on petioles. The first true leaves are simple, kidney shaped or lobed. Subsequent leaves are compound, which are arranged alternately on stem.

**Roots:** Hairy bittercress has a shallow and fibrous root system (Figure 4). This makes it easy to control by hand weeding and cultivation.



Figure 2. Hairy bittercress growing on greenhouse benches. Photo credits: Debalina Saha (Dept. of Horticulture, Michigan State University)



Figure 3. Dense basal rosette of hairy bittercress growing on the weed fabric of greenhouse. Photo credits: WildFoodUK <https://www.wildfooduk.com/edible-wild-plants/hairy-bittercress/> )



Figure 4. Shallow fibrous root system of hairy bittercress. Photo credits: Fred Yelverton (Crop & Soil Sciences, North Carolina State University)



Figure 5. Small white flowers of hairy bittercress with four petals and four to six stamens. Photo credits: Michigan State University, Plant & Pest Diagnostics



Figure 6. Seed pods growing on upper stem of the hairy bittercress. Photo credits: Debalina Saha (Dept. of Horticulture, Michigan State University)

**Shoot:** The plant stem is glabrous and erect, 3 to 8 inches long, reddish, or purplish at the base and becoming greener towards the top of plant. During the initial growth, it develops basal leaves in a dense rosette form (Figure 2). The rosette is 2-4 leaved and the leaves are stalked. The leaf stalk is hairy. The leaflets of rosette are roundish to oval and there is a terminal leaflet, which is larger than others and is almost round in shape. Leaves are also present on the upright stem which are alternately arranged, rounded, 1.5- 5.5 cm long, sparsely hairy, have slightly serrated margins, have fewer leaflets, are generally smaller than the rosette leaves.

**Flowers:** Flowering occurs from anytime between March and June depending upon location. The flowering stalk originates from the center of rosette and flowers are present in small groups at the apex of stem, in clusters known as racemes. The flowers are small, white in color, with four petals (1.5-4.5 mm long) and four to six stamens (Figure 5).

**Fruit and Seeds:** Hairy bittercress is a self-pollinating plant, and the seed pods (Figure 6) grow on upper stem, above the leaves and below flowers. The flowers quickly develops in to pods and mature fast. The seed pods are dehiscent and explode on slightest touch. Seed pods are upright pointing, cylindrical siliquae, which measure from 1.5 to 2.5 mm in length and 0.3-0.7 mm in width, containing tiny seeds. Each plant produces up to 5000 seeds (Bachman and Whitwell, 1994). The seeds may disperse up to several feet around the plant. The seeds of hairy bittercress have no dormancy requirements and they can germinate quickly in presence of favorable conditions. The seeds may remain viable in soil for several years in case of unfavorable growing conditions (Marble et al., 2014).

**Nonchemical Control:** Prevention is the first step to control weeds in ornamental crop production inside greenhouses. It is important to use weed-free substrates/media, inspect new shipment of plant materials and containers to prevent introduction of new weed infestations, and to maintain proper irrigation inside the greenhouses. Reducing irrigation for container production is not recommended rather adequate amount of irrigation need to be applied by avoiding over-irrigation as hairy bittercress prefers moisture. Sanitation is critical for hairy bittercress control in greenhouse ornamental production. Ensure that reused containers are washed and cleaned thoroughly to reduce bittercress contamination in containers. Coarse textured mulches such as pine bark can be applied to containers at a depth of about two inches or more, in order to avoid bittercress seed germination. Due to its extensive seed spread at later stages, it is important to control the hairy bittercress at early stages by keeping a regular check in the greenhouses and containers. Hand weed young hairy bittercress plants before they reach flowering stage. Remove the pulled plant parts from the area and dispose immediately, as they are resilient in nature.

**Chemical Control:** Inside the greenhouse there are limited options of herbicide uses. There are chances of severe phytotoxic injuries to the ornamental plants from the herbicide vapors that may build up inside the greenhouse.

Indaziflam (Marengo) is labeled for use on greenhouse floors, but greenhouses should be empty during application. Ornamentals can be placed back inside 24 hours after treatment. Flumioxazin (SureGuard) can also be used on greenhouse floors if it is empty. Both indaziflam and flumioxazin have shown good control of hairy bittercress as preemergence herbicides. It is always recommended to read the manufacturer's label carefully before applying any herbicides and follow all precautions.

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