e-GRO Alert

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Controlling Spotted Spurge in Greenhouse Container Production

Chamaesyce maculata or *Euphorbia maculata*, also known as spotted spurge or spotted sandmat, is a common broadleaf weed in nursery containers, landscapes, greenhouses, gardens, lawns, other agricultural areas of production and non-crop areas. It is a summer annual, low-growing, prostrate weed in the plant family Euphorbiaceae, having spotted leaves (Young, 2012). Spotted spurge is native to North America and is widely distributed throughout the United States (Molinar et al., 2009).

Figure 1: A mature spotted spurge (*Chamaesyce maculata*) plant growing on container media surface. (Photo credit: Debalina Saha, MSU Horticulture)

This alert will help growers to identify spotted spurge, understand its biology and develop strategies for its management.

Habitat: Spotted spurge occurs in a wide range of habitats including vegetable production fields, lawns, citrus, ornamental beds, gardens, container nurseries, non-crop sites, sidewalks, parks, institutional grounds, athletic fields and greenhouses. It proliferates well in sunny conditions and occurs in a variety of soils (Molinar et al., 2009; Landschoot et al., 2020).

Growth Habit: Spotted spurge is herbaceous, low-growing, mat forming summer annual, emerging in early to mid- summer. It has small (less than 0.5 inches long) linear or egg-shaped leaves arranged in opposite pairs. It has a prostrate growth habit with stems growing up to 2 feet and not more than a few inches high (Wisconsin Horticulture, Division of Extension, 2021). There is often a dark spot in the center of leaf. Individual plants tend to form a mat, along the soil surface, with branches growing outwards from a central growth point in roughly radial patterns (Landschoot et al., 2020).

Seedling: Seeds of spotted spurge germinate in warm soils at temperatures more than 75°F but may also germinate in cooler temperatures when moisture is available. Light is required for seed germination. Seedlings are green or reddish in color. Plants grow and develop slowly and become noticeable only in mid or late summer. Stems originate from the central growth point and develop mostly radially spreading like a circular mat as shown in Figure 1 (Wisconsin Horticulture, Division of Extension, 2021). Short stems have scale-like appendages or stipules at their base (Molinar et al., 2009).

Roots: Plants form tap root at the central growth point, which can extend up to 24 inches in the soil (Molinar et al., 2009). Stems do not form roots at nodes (Landschoot et al., 2020).

Figure 2: Reddish stems of spotted spurge with fine hairs, having opposite leaves with a purple spot along the middle vein. (Photo credit: Debalina Saha, MSU Horticulture)

Figure 3: Milky-white latex oozing out from severed spotted spurge stems: (Photo credit: Peter Landschoot, Penn State University)

Figure 4: The flowers and fruits of spotted spurge. (Photo credit: Susan Mahr, University of Wisconsin – Madison)

Shoot: Spotted spurge has reddish colored branched stems that have fine hairs (Figure 2). Broken or punctured stems secrete a milky-white, sticky sap that is poisonous and can irritate skin and eyes (Figure 3). Leaves have a short petiole, are arranged in opposite pairs and are unequal (Landschoot et al., 2020).Leaves are small, oblong, dark green with purple spots in the center (on more than 95% of leaves), hairy, smooth or finely toothed, mostly rounded at tips, and measure about one inch (Figure 2) (Molinar et al., 2009).

Inflorescence: Under ideal conditions, plants begin to flower just one month after germination (Wisconsin Horticulture, Division of Extension, 2021). Plants are monoecious, producing tiny, white and pink flowers in the leaf axils. Flowers consist of only stamens and hairy pistils, having white to pink petaloid (Petal like) appendages and are grouped in cup-like structures, known as cyathia (Figure 4) (Molinar et al., 2009).

Seedpods (Fruit): The flowers may start producing fruits and seeds one month after flowering under ideal conditions (Wisconsin Horticulture, Division of Extension, 2021). Fruit is hairy, tripartite with a three-chambered capsule that is about 1/16 inch, having one seed in each locule. Each seed is approximately 0.5 mm in width and 1 mm in length. Seeds are wrinkled and light brown in color (Wisconsin Horticulture, Division of Extension, 2021; Young, 2012; Molinar et al., 2009).

Seeds: Reproduction of spotted spurge occurs via seed (Unruh 2013). Under ideal conditions, plants can produce seeds prolifically with approximately 500 seeds per square feet (Young, 2012). Generally, plants produce thousands of seeds that may germinate immediately (for seeds produced in summer) or remain dormant in soil during winter in order to give rise to plants in the following spring or summer (for seeds produced in late summer or fall) (Wisconsin Horticulture, Division of Extension, 2021; Landschoot et al., 2020). Seeds buried deeper than ½ inch do not germinate due to absence of light (Molinar et al 2009).

Seeds are dispersed by wind and ants. Also, owing to their stickiness, they easily cling to animal fur, shoe soles, clothes, tires of lawn mowers and tools, which aid in seed dispersal (Young, 2012; Wisconsin Horticulture, Division of Extension, 2021).

Similar Species: There are many spurges similar to spotted spurge. Ground spurge (*Euphorbia prostrata*) has shorter and more rounded leaves than spotted spurge. It lacks any markings on leaves and have roots at the nodes of stems. Seed color of ground spurge varies from white to gray and sharp ridges are present on seed surface. Prostrate spurge (*E. humistrata*) has prostrate, freely branched stems that bear roots at nodes. Leaves are light green, asymmetrical and usually have a reddish blotch in the center of leaf. Garden spurge (*E. hirta*) has prostrate growth habit, but its leaves are less rounder in shape and bigger in size than spotted spurge.

Management of Spotted Spurge

Non-chemical Control: Scouting for spurge is important for control and grower need to remove weeds at early stages when infestations begin. Growers need to check that planting material is free from any weed infestation and planting should be done in a weed-free substrate. Hand weeding can be followed to remove spurge plants before they set seed. Worker must wear gloves during hand weeding as the plant sap is a skin irritant (Landschoot et al., 2020). Walking through spurge mats should be avoided to control seed spread. Growers must also avoid raking of uprooted or mature spurge plants across the soil surface and dead spurge plants should be disposed carefully. Tools must be cleaned or washed off to remove any spurge seeds. Shady conditions inhibit seed germination of spotted spurge. Irrigation systems must be in proper working order to avoid unwanted wet areas that promote spurge infestations (Young, 2012). Mulching with organic materials such as shredded bark, compost or straw up to two inches depth in containers can also suppress seed germination (Molinar et al., 2009).

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 can control or show suppression of spotted spurge as preemergence herbicides. It is always recommended to read the manufacturer's label carefully before applying any herbicides and follow all precautions.

The products containing oryzalin, prodiamine, benefin, dithiopyr, pendimethalin, isoxaben or trifluralin can be used for preemergent control of spotted spurge (Young, 2012). Spotted spurge can be controlled by application of various postemergent herbicides to plant foliage, particularly those containing combinations of 2,4-D, MCPP, dicamba and/or fluroxypyr. However, none of these herbicides are labeled for use inside a greenhouse or other fully enclosed structures.

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