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ENH1261

Biology and Management of Graceful Sandmat (*Chamaesyce hypericifolia*) in Ornamental Crop Production[1]

Theresa Chormanski, Chris Marble, and Lyn Gettys[2]

Species Description

Class

Dicotyledonous plant

Family

Euphorbiaceae

Other Common Names

spurge, sandmat spurge, yerba nina (Hammer 2015)

Life Span

Summer annual

Habitat

Graceful sandmat occurs in pine forests, disturbed areas, roadsides, turf areas, landscape beds, and nursery containers. It is most often found in areas receiving full to partial sun. It can grow in dry or wet environments with a short hydroperiod and has been observed growing in wetland habitats and borders of marshes and ponds.

Distribution

Graceful sandmat is native to North America and is found throughout Florida, the southern US, and other tropical and sub-tropical regions throughout the world (Chen and Wu, 2004; USDA, NRCS, 2015).

Growth Habit

Erect, upright growing herb (Figure 1)

Figure 1. Graceful sandmat growing in a mulched landscape bed. Notice the upright growth habit.
Credits: Annette Chandler, UF/IFAS Mid-Florida Research and Education Center

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Seedling

Cotyledons are dark green with round, opposite leaves and red stems.

Shoot

Graceful sandmat can grow over 2 ft tall but normally grows to less than 1 ft tall. Stems are round, thin (1 to 2 mm), red, and sometimes wiry but never woody. Leaves are purplish red to green, elliptic in shape, 1 to 2.5 cm in length, oppositely arranged, and have red petioles and red interpetiolar stipules (Figure 2). The base of the leaf is unequal. Leaf margins appear to be entire but are slightly denticulate (toothed or serrate) upon closer examination. Leaves are crowded toward the top of the stem while the lower portion of the stem is bare (due to leaf drop over time). All parts of the stem and leaves exude a milky sap when broken.

Figure 2. Graceful sandmat stem. Notice presence of red petioles and red stipules near the base of each leaf.
Credits: Annette Chandler, UF/IFAS Mid-Florida REC

Roots

Weak taproot

Inflorescence

Small, cyanthia flowers with four reddish to white to green petals (Figure 3)

Fruit and Seeds

Fruit is a small, green schizocarp (dry fruit) that splits into three parts. Seeds are very small and are dark brown to black when mature.

Figure 3. Graceful sandmat inflorescence.
Credits: Theresa Chormanski

Similar Species

While many types of sandmat are common in Florida nurseries, *C. hyssopifolia* is one of the species more closely related to *C. hypericifolia* and may be mistakenly identified as *C. hyssopifolia*. Both species have fruit and stems that are glabrous and are distinguished by the length of their stipules and fruit. *Chamaesyce hypericifolia* has conspicuous stipules that are longer than wide (1–1.5 mm long) and shorter fruit (less than 1.3 mm long). *Chamaesyce hyssopifolia* has inconspicuous stipules and longer fruits (more than 1.3 mm long) (Figure 4) (Wunderlin and Hansen 2008a, b).

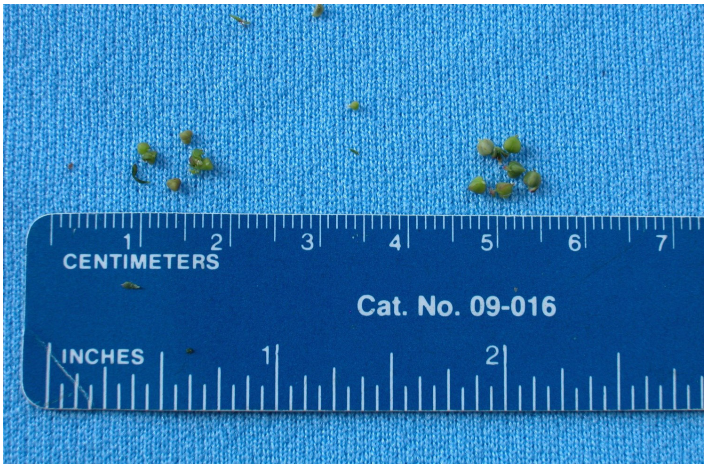

Figure 4. Smaller capsules of *C. hypericifolia* on left and larger capsules of *C. hyssopifolia* on the right.
Credits: Annette Chandler, UF/IFAS Mid-Florida REC

Plant Biology

Graceful sandmat is a summer annual weed, but it can grow throughout the year in southern and central Florida if frost does not occur. The weed is fast growing and begins to flower and produce seeds when young. Seeds are generally

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produced from late spring to the end of fall. Populations can increase quickly because seeds have no dormancy requirement and can germinate immediately. Although little data exist on the optimal temperatures for *C. hypericifolia* germination, many spurge species such as *C. supina* have the highest germination rates between approximately 75°F and 85°F (Krueger and Shaner 1982).

Management

Physical and Cultural Control

Graceful sandmat is most problematic in container nurseries because it is often found growing in container media. Graceful sandmat can also grow in landscape beds and other disturbed areas. Due to its prolific seed production, graceful sandmate must be removed by hand when it is small and before it begins to flower and produce seeds. However, hand weeding is labor intensive because graceful sandmat produces a large number of seedlings and the size and color of these seedlings make them difficult to see against the container media. Spurge (sandmat) germination is higher when seeds are exposed to light. Cochran et al. (2009) found that applying mulch at depths of 0.5 to 1.0 inch reduced germination of other spurge species, so similar mulching may also be an effective control against graceful sandmat.

Chemical Control

PREEMERGENCE

Most preemergence herbicides provide control of sandmats (*Chamaesyce* spp.). However, these species continue to be difficult to control due the number of seeds they produce and how rapidly they grow. Researchers have noted that in general, dinitroaniline herbicides (e.g., pendimethalin, prodiamine, etc.) are more effective than oxadiazon or oxyfluorfen (Neal and Derr 2005). Little data exist on the most effective herbicides for graceful sandmat; however, herbicides that provide control of other sandmat (or spurge) species will likely be effective. A partial list of preemergence herbicides labeled for use in ornamentals for control of *Chamaesyce* spp. is given in Table 1.

POSTEMERGENCE

Contact and systemic (translocated) herbicides labeled for use in and around nurseries will control sandmats. A list of postemergence herbicides labeled for use in nurseries and landscapes is available at http://edis.ifas.ufl.edu/wg059. Weeds should be sprayed when they are small and actively growing in order for the herbicides to work effectively and to prevent further seed production. When weeds are growing in container-grown crops, especially small containers, postemergence herbicides cannot be applied without causing potential damage to the ornamental crop. Growers should focus their efforts on increasing sanitation efforts, following proper cultural management practices, and using labeled preemergence herbicides.

Disclaimer

Mention of a commercial or herbicide brand name or chemical does not constitute a recommendation or warranty of the product by the authors or the University of Florida Institute of Food and Agricultural Sciences, nor does it imply its approval to the exclusion of other products that may also be suitable. Products should be used according to label instructions and safety equipment required on the label and by federal or state law should be employed. Pesticide registrations may change, so it is the responsibility of the user to ascertain if a pesticide is registered by the appropriate state and federal agencies for its intended use.

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Table 1. Preemergence herbicides labeled for use in ornamental plant production and landscapes for control of spurge (*Chamaesyce*) species[1].

Common Name (active ingredient)	Example trade name and formulation	WSSA Herbicide Group[2]	Container production	Field production	Greenhouse or fully-enclosed structures	Landscape
dithiopyr	Dimension® 2EW	3	YES	YES	NO	YES
oryzalin	Surflan® 4AS	3	YES	YES	NO	YES
	Oryzalin 4 Pro	3	YES	YES	NO	YES
pendimethalin	Pendulum® 2G	3	YES	YES	NO	YES
	Pendulum® 3.3EC, 3.8AC		YES	YES	NO	YES
prodiamine	Barricade® 4FL, 65 WG	3	YES	YES	NO	YES
flumioxazin	Broadstar™ 0.25G	14	YES	YES	NO	YES
	SureGuard® 51WDG		YES[3]	YES	NO	YES[4]
dimethenamid-p	Tower® 6EC	15	YES	YES	NO	YES
dichlobenil	Casoron® 4G	20	NO	YES	NO	YES
isoxaben	Gallery® 75DF, 4.16SC	21	YES	YES	NO	YES
indaziflam	Marengo® 0.622 SC	29	NO[5]	YES	YES[6]	NO
	Marengo® 0.0224G		YES	YES	NO	NO
benefin + oryzalin	XL 2G	3 + 3	YES	YES	NO	YES
pendimethalin + dimethenamid-p	FreeHand® 1.75G	3 + 15	YES	YES	NO	YES
trifluralin + isoxaben	Snapshot® 2.5TG	3 + 21	YES	YES	NO	YES
prodiamine + isoxaben	Gemini	3 + 21	YES	YES	NO	YES
oxadiazon + pendimethalin	Jewel® 3.25G	14 + 3	YES	YES	NO	YES
oxyfluorfen + pendimethalin	OH2® 3G	14 + 3	YES	YES	NO	YES
oxyfluorfen + prodiamine	Biathlon® 2.75G	14 + 3	YES	YES	NO	YES
oxyfluofen + trifluralin	Granular Herbicide 75 5G	14 + 3	YES	YES	NO	YES
oxyfluorfen + oxadiazon	Two OX E-Pro 3G	14 + 14	YES	YES	NO	YES
trifluralin + isoxaben + oxyfluorfen	Showcase® 2.5G	3 + 21 + 14	YES	YES	NO	YES

[1]Herbicide labels list the spurge genus as *Euphorbia* spp. which is the former genus name for spurge.
[2]Herbicide groups are based according to primary sites of action and can be used to select herbicides that have differing sites of action (Mallory-Smith and Retzinger 2003) so as to minimize the potential for the development of herbicide resistant weeds.
[3]Can only be used in selected conifer and deciduous tree species. Check product label for a complete list of species and recommended application methods.
[4]Can be applied as a directed application around established woody landscape ornamentals.
[5]Marengo 0.622 SC can be used in pot-in-pot container ornamentals as a directed application only. Specticle™ is labeled for use in landscapes.
[6]Labeled for use on greenhouse floors prior to plant production. Plants can be placed back inside greenhouse 24 hrs after application.