

Virginia Buttonweed (*Diodia virginiana*)

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Introduction

Virginia buttonweed (*Diodia virginiana*) is one of the most difficult-to-control broadleaf weeds in turf. It commonly proliferates in poorly drained areas and can tolerate mowing heights as low as one-half inch. This deep-rooted perennial produces both above- and below-ground flowers. Its prolific seed production, extensive root system and ability to vegetatively reproduce make control extremely difficult.

Virginia Buttonweed Identification

Virginia buttonweed is a spreading perennial with opposite leaves (Figure 1) that often have a mottled, yellow appearance due to a virus that commonly infects the foliage. Stems are occasionally hairy. A unique characteristic of Virginia buttonweed is that it produces both above- and below-ground flowers that self-pollinate. The above-ground flowers are white and star-shaped with four petals (Figure 2). Fruit are often green and elliptical with hairy ridges (Figure 3). Virginia buttonweed produces deep taproots and rhizomes that often start at the nodes. Rhizomes can be found as deep as several feet below the soil sur-

face. Virginia buttonweed can form very dense mats in established turf. Above-ground fruit are buoyant, allowing them to be transported with surface water to other areas. Virginia buttonweed can also reproduce from stem fragments. If not removed, clippings from mowing or weedeating can establish into mature plants. Hand removal of Virginia buttonweed is often ineffective, because any stem fragments or rhizomes left behind can produce a viable plant.



Figure 2. Virginia buttonweed (*Diodia virginiana*) flower



Figure 1. Mat of Virginia buttonweed (*Diodia virginiana*)



Figure 3. Virginia buttonweed (*Diodia virginiana*) fruiting structure

Table 1. Herbicide options for Virginia buttonweed control

Product Name	Active Ingredients	Rate/ac	Turf Species
Blindside	sulfentrazone + metsulfuron	3.2-10 oz.	Bermudagrass, Zoysiagrass, Tall Fescue, Kentucky Bluegrass
Celsius	thiencarbazone + iodosulfuron + dicamba	4.9 oz.	Bermudagrass, Centipedegrass, Zoysiagrass
Confront	triclopyr + clopyralid	1-2 pts.	Kentucky Bluegrass, Fine Fescue, Tall Fescue, Perennial Ryegrass, Bermudagrass, Zoysiagrass, Centipedegrass
Escalade II	2,4-D + fluroxypyr + dicamba	2-3 pts.	Kentucky Bluegrass, Fine Fescue, Tall Fescue, Perennial Ryegrass, Bermudagrass, Zoysiagrass
Momentum fx2	2,4-D + triclopyr + fluroxypyr	3-4 pts.	Kentucky Bluegrass, Fine Fescue, Tall Fescue, Perennial Ryegrass, Bermudagrass, Zoysiagrass, Centipedegrass
Monument	trifloxysulfuron	0.53 oz.	Bermudagrass, Zoysiagrass
Tribute Total	thiencarbazone-methyl + foramsulfuron + halosulfuron	3.2 oz	Bermudagrass, Zoysiagrass

Virginia Buttonweed Control Options

Option 1 - Sulfonyleurea herbicides: Two applications (four weeks apart) of Blindside, Celsius, or Monument, or Tribute Total are the best programs to control Virginia buttonweed utilizing sulfonyleurea herbicides. See Table 1 for a complete list of herbicides active against Virginia buttonweed. Beginning applications in May (before Virginia buttonweed begins to flower) will improve control, as will including a non-ionic surfactant at 0.25 percent v/v in the spray solution.

Option 2 - Phenoxy and Phenoxy-type herbicides: Sequential applications of materials that contain three or more phenoxy (or phenoxy-type) herbicides can be used to control Virginia buttonweed in established turf. Materials containing clopyralid or fluroxypyr in the mixture have performed well in research at the University of Tennessee. Clopyralid is found in such herbicides as Confront (triclopyr and clopyralid) and Millenium Ultra (2,4-D, clopyralid and dicamba), while fluroxypyr can be found in herbicides such as Escalade II (fluroxypyr, 2,4-D and dicamba).

Sequential applications of Confront at 1 or 2 pt/acre, Millenium Ultra at 2.5 pt/acre and Escalade II at 2 or 3 pt/acre are the most effective options for control of Virginia buttonweed with phenoxy or phenoxy-type herbicides. See Table 1 for a complete list of herbicides active against Virginia buttonweed. Multiple applications of Confront will injure bermudagrass at the 2 pt/acre rate, so be sure to use the lower rate of 1 pt/acre.

Final Thoughts

Virginia buttonweed control in established turf can be difficult due to the plant's rhizomatous growth habit, extensive root system, aggressive growth and ability to reproduce vegetatively. Sequential applications of postemergence herbicides will be required to provide effective control.

Always refer to the product label for specific information on proper product use, tank-mix compatibility and turfgrass tolerance.

Herbicides listed in this publication have provided good to excellent control in research trials conducted at the University of Tennessee; however, other herbicides may also have activity on these weeds. For more information on herbicide selection, please visit the University of Tennessee Mobile Weed Manual (MWM) at mobileweedmanual.com. MWM was developed by UT Extension professionals to assist green industry professionals in selecting herbicides for use in turf and ornamentals. MWM is a web-based platform optimized for use on mobile devices such as smartphones and tablets, but it will function on desktop and laptop computers as well. The site provides users with weed control efficacy information for 90 different herbicides, tolerance information for over 2,300 turf and ornamental species, as well as direct links to label and material safety data sheet information on herbicides used for turf and ornamental weed management.

For more information on turfgrass weed control, visit the UT Institute of Agriculture's turfgrass weed science website, tennesseeturfgrassweeds.org.



Disclaimer

This publication contains herbicide recommendations that are subject to change at any time. The recommendations in this publication are provided only as a guide. It is always the herbicide applicator's responsibility, by law, to read and follow all current label directions for the specific herbicide being used. The label always takes precedence over the recommendations found in this publication.

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