



Solution Sheet

Virginia Buttonweed

The Problem

Virginia buttonweed (*Diodia virginiana*) is a mat-forming, spreading, deep-rooted, perennial herb with hairy, branched stems from a woody rootcrown. It has multiple means to reproduce, including above and below ground, self-pollinated seed, plus regeneration from stem and root fragments. Hand removal is often ineffective as root or stem fragments typically remain, and the plant can further spread from mowing or string trimmer clippings. Due to Virginia buttonweed's prostrate growth habit, it can also withstand mowing heights as low as 0.5 inch.

What To Look For

Virginia buttonweed leaves are opposite, elliptic to lance-shaped, sessile (attached directly to the main stem), and joined across their stems by a membrane with a few "hair-like" projections. Leaves initially are dark green and shiny (waxy), but often become yellowish and mottled by a virus in late summer. Unfortunately, the virus does not significantly control or slow the spread of the plant. Leaves root at their lower nodes, allowing large mats to eventually form. White tubular flowers with four lobes, at each leaf axil along the stem, form a fourpointed star shape. Flowers usually have only two sepals and bloom in summer. Fertile subterranean flowers also are produced. Fruits are green, elliptically-shaped, hairy, ridged and at each leaf axil. Seeds are buoyant, thus, easily spread by water. Virginia buttonweed favors moist to wet sites in woods, marshes and wet turf.

Poorjoe (*D. teres*) is similar to Virginia buttonweed, but is a summer annual with coarse, reddish, hairy stems that grows erect to 12 inches tall when not mowed. Poorjoe leaves are opposite, thin, narrow, and pointed, and flowers have 4 sepals.

Florida pusley (*Richardia scabra*) also resembles Virginia buttonweed; however, it is a summer annual and its leaves and stems are densely hairy, and flowers are 6-parted, not 4-parted as with Virginia buttonweed.

The Solution

Virginia buttonweed is a difficult-to-control broadleaf weed due, in part, to its varied means of reproduction, perennial growth cycle and waxy leaf coating which alters plant penetration for many herbicides. Preemergence herbicides often provide poor control. Key Envu solutions for postemergence control include Tribute® Total, Celsius® WG, and Celsius® XTRA.

Celsius WG contains a sulfonyleurea herbicide, iodosulfuron, plus dicamba, along with thienencarbazone-methyl. Single applications of Celsius WG typically provide about 80% control, while two applications are often needed for complete control. In addition to bermudagrass and zoysiagrass, Celsius WG may be used in centipedegrass and St. Augustinegrass. Celsius WG also controls doveweed, spurge, carpetgrass and many other troublesome weeds.

Tribute Total contains the sulfonyleurea herbicides, foramsulfuron and halosulfuron-methyl, as well as thienencarbazone-methyl. It can be used on bermudagrass and zoysiagrass, and also controls *Poa annua*, goosegrass, clumpy ryegrass and many additional broadleaf and grassy weeds, as well as sedges and kyllingas.

Celsius XTRA contains the sulfonyleurea herbicides iodosulfuron, thienencarbazone-methyl, and halosulfuron. Two applications of Celsius XTRA are needed for control of Virginia buttonweed and it will also control sedges and many other problematic broadleaf weeds.

Apply Celsius WG, Celsius XTRA, or Tribute Total in the spring when growth of Virginia buttonweed is apparent, and repeat when regrowth occurs, usually in approximately four weeks. Do not apply either product on or adjacent to desirable cool-season turf. Both products can be applied as a broadcast spray or spot treatment.

Broadcast Applications For Postemergence Virginia Buttonweed Control In Warm-Season Golf Turf

Solution	Rate (per acre)	Application Notes
Celsius® WG	4.9 oz. Add adjuvant as indicated on label	Apply in spring when plant growth is apparent. A repeat application will be needed if regrowth occurs, typically 3 - 4 weeks following the initial. Safe to use on bermudagrass, centipedegrass, St. Augustinegrass and zoysiagrass. Also controls doveweed, spurges, carpetgrass and many additional broadleaf weeds.
Celsius XTRA	7.5 oz. followed by 7.5 oz. Add adjuvant as indicated on label	Mix with a nonionic surfactant (NIS) unless temperatures are over 90°F. A second application may be required 5 - 7 weeks after the initial treatment. Do not make more than two applications or 15 oz./acre per year. Safe to use on bermudagrass, centipedegrass, St. Augustinegrass and zoysiagrass. Also controls sedges, and many additional broadleaf weeds.
Tribute® Total	3.2 oz. Add adjuvant as indicated on label	Use in bermudagrass and zoysiagrass. Do not apply on or adjacent to desirable cool-season turf. Also controls/suppresses a number of broadleaf weeds, as well as dallisgrass and tropical signalgrass.

Spot Applications For Postemergence Virginia Buttonweed Control In Warm-Season Golf Turf

Solution	Rate (per gallon)	Application Notes
Celsius WG	0.113 oz. (3.2 g) Add adjuvant as indicated on label	To make a spot treatment, mix 0.113 oz. (3.2 g) of Celsius WG per gallon and apply until weeds are wet. One gallon of spray solution will treat up to 1,000 sq. ft. Make a second application when re-growth is observed. Do not exceed 0.17 oz (4.8 g) of product per 1,000 sq. ft. in a calendar year. Apply in spring when plant growth is apparent. Safe to use on bermudagrass, centipedegrass, St. Augustinegrass and zoysiagrass. Also controls doveweed, spurges, carpetgrass and many additional broadleaf weeds.
Celsius XTRA	0.23 oz followed by 0.12 oz or 0.17 oz followed by 0.17 oz	To make a spot treatment, mix 0.17 oz. - 0.23 oz. of Celsius XTRA per gallon of water and add a non-ionic surfactant at 0.25% v/v (0.36 oz./gal or 2 tsp/gal) to treat 1,000 sq. ft. Spray weeds to wet but avoid spraying to the point of run-off. Spot treatments may cause yellowing and/or growth regulatory effects to the turfgrass. A second application may be required 5 - 7 weeks after the initial treatment. Do not make more than two applications or 15 oz./acre per year. Also controls sedges, and many additional broadleaf weeds.
Tribute Total	0.073 oz. Add adjuvant as indicated on label	To make a spot treatment, mix 0.073 oz of Tribute Total per gallon of water and add appropriate spray adjuvant(s). Spray weeds until wet, but avoid spray solution runoff and over-application. Spot treatments are likely to cause yellowing and growth regulatory effects to the turfgrass. For spot treatments, treat no more than 10,000 sq ft per acre. Use in bermudagrass and zoysiagrass. Also controls/suppresses a number of broadleaf weeds, as well as dallisgrass and tropical signalgrass.

White tubular flowers of Virginia buttonweed with four lobes, forming a four-pointed star shape.
(Dr. Bert McCarty, Clemson University.)



Virginia buttonweed often turns a mosaic yellow in late summer due to a virus invasion, but virus does not kill or reduce the spread of the plant.
(Dr. Bert McCarty, Clemson University.)

