Bermudagrass is the dominant turf species in warmer climates. In general, herbicides that can be used on bermudagrass can be used safely on zoysiagrass. However, special attention should be paid to herbicide labels regarding applications to centipedegrass and St. Augustine, which are similar to each other in their tolerance to herbicides.

Summer grass weeds: Large crabgrass and dallisgrass invade more turf acreage in the southern U.S. than any other grasses. Germinating seeds of both can be satisfactorily controlled with benefin, bensulide, DCPA, oryzalin, pendimethalin, atrazine, and simazine. Certain formulations of atrazine are labelled for use on St. Augustine, zoysia, and centipedegrass for sod production while other commercial products containing atrazine are labeled for homeowner use. A combination of acetamide (Dual) and either atrazine or simazine is currently being tested for effectiveness.

Only asulam is used for post-emergence control of crabgrass and dallisgrass in St. Augustine. MSMA and DSMA are effective post-emergence herbicides for these weeds in bermudagrass. The arsonates MSMA and DSMA are used almost exclusively in bermuda and zoysia turfs.

Goosegrass is the most difficult summer grass to control in the South. Timing of application of pre-emergence herbicides is of paramount importance if control is to be achieved. We generally think goosegrass starts germinating in significant quantities four to six weeks after crabgrass. However, this may vary. In the lower South, the two species may well germinate simultaneously.

If application of a pre-emergent herbicide is delayed, large crabgrass may escape because it germinates earlier than goosegrass. In bermudagrass and zoysia, large crabgrass can be controlled quite effectively with post-emergence applications of the arsonates.

Pre-emergence herbicides would appear to be a better approach to goosegrass control than post-emergence control with arsonates. Oxadiazon (Ronstar) and oryzalin (Surflan) give excellent, season-long control of goosegrass. Research has shown post-emergence applications of MSMA plus metribuzin (Sencor) gives good control of goosegrass.

Sandbur and bahiagrass in bermuda and zoysia can be controlled with arsonates.

Research results over the past few years have shown that bahiagrass can be selectively controlled in established centipedegrass with sulfonyluron or metsulfuron, but neither material is currently labelled for this use.

At present, there is no selective control of torpedograss in southern turf.

Both annual and perennial sedges are problems in the South. Purple nutgrass and, to a lesser degree, yellow nutgrass are the most severe problems. Multiple applications of arsonates or an arsonate/phenoxy combination are generally recommended for purple nutgrass, only on bermuda or zoysia. Basagran can be used for control of yellow nutgrass and several annual species.

Summer broadleaf weeds are a problem throughout Southern turf but not to the extent of the grassy weeds, such as dallisgrass, large crabgrass, and goosegrass.

Prostrate spurge and Virginia butterweed, along with yellow woodson-
Dallisgrass Annual bluegrass are important and difficult-to-control broadleaf weeds.

Multiple applications of 2,4-D plus dicamba, Trimec, or Trex-San are almost always necessary. Researchers suggest the use of a non-ionic surfactant with the herbicide.

Winter grass weeds: Annual bluegrass is by far the most severe grassy weed infesting southern turf during the late fall, through the dormancy period, and into the early spring.

Annual bluegrass decreases the aesthetic value of turf and interferes with warm-season turfs in late spring.

Coverage is usually slow following fade out of annual bluegrass, leaving large sections of bare ground exposed.

Other weeds, such as goosegrass, tend to move into bare areas.

Annual bluegrass control with pre-emergence herbicides is usually accomplished with either benefin, bensulide, DCPA, oryzalin, pendimethalin, pronamide, simazine, or oxadiazon.

Two applications may be necessary during the dormant season for acceptable control, except with pronamide, oryzalin, or simazine, all of which provide pre-emergence and post-emergence control of annual bluegrass in bermudagrass.

There are three choices for annual bluegrass control on bermudagrass greens overseeded with perennial ryegrass.

Bensulide may be applied prior to overseeding as a pre-emergence approach. Ethofumesate may be applied 15 to 30 days after overseeding. Check label for timing to avoid delaying spring transition back to bermudagrass.

Fenarimol, a fungicide, applied two weeks prior to overseeding, controls several turf diseases in addition to controlling annual bluegrass.

Another approach employed particularly on golf courses, is to use a post-emergence, non-selective herbicide such as paraquat, glyphosate, or cacocylic acid prior to the warm-season turf breaking dormancy. This
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Annual bluegrass and annual broadleaf weeds are usually controlled effectively by selective herbicides. Injury is often encountered if bermudagrass is breaking dormancy at the time of application. The degree of injury is dependent upon the herbicide used and the amount of green foliage at the time of application.

Winter broadleaf weeds: Important winter broadleaf weeds include common chickweed, henbit, clovers, spurweed, mouse-ear chickweed, lawn burweed, common dandelion, wild onion, wild garlic, plantains, and speedwells.

Pre-emergence control of some species can be obtained with benefin, bensulide, DCPA, pendimethalin, simazine, and other herbicides.

HENBIT

**BENEFIN**—POOR

**BENSULIDE**—POOR

**DCPA**—EXCELLENT

**Oxadiazon**—VARIABLE

**Pendimethalin**—EXCELLENT

**Siduron**—VARIABLE

Henbit, chickweed, and clovers usually require something other than 2,4-D for post-emergence control. In dormant bermudagrass and zoysiagrass, dicamba or combinations with dicamba are used often for post-emergence control.

The phenoxy herbicides are safe on completely dormant turfs. However, actively growing turfs vary considerably in tolerance to phenoxy materials.

The combination of mecoprop plus chlorfurecol is often used, especially by the homeowner on St. Augustine. Several experimental herbicides show promise for control of wild garlic and numerous winter broadleaf weeds. Single applications of imazaquin, sulfonyluron, and metoluron have provided control of wild garlic equal to that obtained from multiple applications of phenoxy herbicides.