

(>90°F). Control also is reduced if rainfall occurs within 24 hours of treatment. Recently, new herbicide releases have provided alternatives to the arsenicals for postemergence grass weed control. Decreased phytotoxicity as well as reduced number of applications are often associated with these herbicides. The following discusses herbicides available for various turfgrass species.

Warm-Season Turfgrasses

Bermudagrass and zoysiagrass. Postemergence control of crabgrass species and goosegrass have been with organic arsenicals (e.g., MSMA/DSMA). As previously mentioned, repeat applications with a short time interval between applications are required, especially for goosegrass control. Increasing phytotoxicity usually results in bermudagrass and zoysiagrass with repeat applications.

In order to increase herbicidal activity on goosegrass, various combinations with other herbicides have been tested with the organic arsenicals. High rates of metribuzin (Sencor), an asymmetrical triazine, gives excellent control of goosegrass, but bermudagrass has marginal tolerance. Lower rates of metribuzin combined with arsenical herbicides provides good to excellent goosegrass control. However, this combination is safely used only on well established bermudagrass that is actively growing and also is maintained at mowing heights greater than ½ inch. The use of metribuzin with MSMA or DSMA increases activity on goosegrass but a certain degree of phytotoxicity and a number of escaped weeds still exist. Metribuzin also has been shown to inhibit photosynthesis of bermudagrass for a certain period of time.

Diclofop-methyl (Hoelon or Illoxan), a member of the aryl-oxy-phenoxy herbicide family, has shown excellent goosegrass control compared to the organic arsenical and metribuzin combinations. Little damage to bermudagrass has resulted and repeat applications are not usually necessary. This herbicide is more active on younger, lower mowed goosegrass. Weed control is relatively slow, often requiring two to three weeks to take effect. The weed control spectrum also appears to be limited, with goosegrass being the most susceptible grass species. Treated areas should not be overseeded with perennial ryegrass for at least six weeks after herbicide application. Diclofop also should not be mixed with any other postemergence herbicides, especially 2,4-D, MSMA, or metribuzin as

reduced goosegrass control and increased turfgrass phytotoxicity may result.

Fenoxaprop-ethyl (Acclaim), another member of the aryl-oxy-phenoxy herbicide family, has been shown to control annual grass weeds, crabgrass species in particular. Zoysiagrass and at much lower rates, bentgrass, have acceptable tolerance to fenoxaprop.

Bahiagrass. Bahiagrass, like St. Augustinegrass, is somewhat sensitive to most postemergence herbicides. This sensitivity limits the choices of materials available for use on it. Although labeled for use on bahiagrass, most postemergence broadleaf (e.g., 2,4-D, dicamba, and/or mecoprop) herbicides will result in yellowing, especially if applied when temperatures are hot or the turf is growing under stressful conditions. Normally, the phytotoxicity is not lethal, and recovery can be expected within one to two weeks.

Selective postemergence grass weed control in golf course grown bahiagrass is not currently available. Spot treatment with a nonselective herbicide, such as glyphosate, is the only chemical method of control.

Cool-Season Turfgrasses

Postemergence grass weed control in cool-season turfgrasses has previously been limited to various members of the organic arsenicals. Specific formulations (e.g., CMA) and rates are necessary for use on most cool-season turfgrasses or unacceptable levels of injury may result. Proper timing at a young weed-growth stage, during mild environmental conditions, and actively growing turfgrasses are specific considerations before using any of these herbicides.

Nutsedge Control

The predominant nutsedge weed species in turfgrasses are yellow and purple nutsedge. Other, more local members of the *Cyperus* genus include annual or water sedge, perennial and annual kyllinga, globe sedge, Texas sedge, flathead sedge and cylindrical sedge. Path or slender rush, a member of the rush (*Juncus*) family, also can occur in some turf situations.

These weeds generally thrive in soils that remain wet for extended periods of time due to poor drainage or excessive irrigation. The first step in