

is suggested that bensulide be irrigated-in or applied within 24 to 72 hours of rain.

Bensulide applied in combination with napropamide (trade name-Devrinol®) or oxadiazon also effectively controls crabgrass. Registration of napropamide is expected soon. A bensulide-oxadiazon combination is available for use on turf. Currently, this product is labeled for use on bermudagrass, perennial ryegrass and Kentucky bluegrass.

Bensulide can discolor *Poa annua*, but **is safe to use on all turfgrasses**, and should only be applied to established turfs. Benefin, DCPA and oxadiazon are not recommended for use on fine-leaf

fescues (*Festuca rubra* and others), or bentgrasses (*Agrostis* sp.). While most preemergence herbicides are safe to use on warm season grasses (i.e. bermudagrass and zoysiagrass), oxadiazon is not recommended for use on zoysiagrass.

Only siduron (trade name-Tupersan®) may be applied in the seedbed at the time of seeding, or on seedling turf. Siduron is injurious to bermudagrass, particularly newly sprigged areas. Siduron has a short residual and does not provide effective, season-long control of crabgrass in the transition zone.

TIMING PREEMERGENTS IN WARM-SEASON GRASSES



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Control of weeds in warm-season turf is a year-long process. Turf managers must develop weed control programs for both summer and winter.

Summer Weed Control

The germination of crabgrass and goosegrass depends on soil temperature and other environmental conditions. In the Piedmont region of Georgia, crabgrass generally germinates by mid-March and goosegrass germinates by mid-April. Studies conducted just south of Atlanta at the Georgia Experiment Station resulted in optimum crabgrass control by Betasan when applied March 15. Crabgrass control was reduced slightly when Betasan was applied early in February and drastically reduced when treatments were delayed until April or May. The poor control from late treatments occurred because weeds had germinated and emerged before chemical applications were made. When Betasan was applied to the same area for two or more years, crabgrass control was effective when full rates were applied the initial year and followed by one-half rates the following year.

When crabgrass has already germinated, tank mixtures of MSMA with preemergence herbicides such as Betasan will improve weed control. The MSMA controlled emerged weeds while preemergence treatment prevented reinfestation from late germinating weed seed. It is important not to apply the combination treatments to St. Augustine, Centi-

pede, or other grasses not tolerant to MSMA treatments.

Registration of Devrinol for turf is expected this fall. Devrinol applied in March controlled crabgrass and goosegrass in both granular and wettable powder formulations. Single March treatment with granular Devrinol controlled a higher percentage of goosegrass than a single March application of the wettable powder. However, a second wettable powder treatment in May resulted in excellent goosegrass control.

The new turf label for Devrinol recommends an application of Betasan in sequence with Devrinol for maximum control of both crabgrass and goosegrass.

Winter Weed Control

Since mild winters occur where warm-season grasses are grown, winter weeds are a continuous problem. Weed identification is important before selecting a preemergence herbicide because a single herbicide will not control all weed species. For example, Betasan was the only chemical that controlled parsley-piert in a study conducted in the Piedmont region of Georgia. However, the treatment must be applied in September or October to obtain effective control. In all instances herbicides applied in September or October controlled a higher percentage of winter weeds than when treatments were applied in July or August. The poor weed control from July and August treatments was related to high temperatures at time of treatment. It should be emphasized that when warm-season grasses are overseeded with cool-season grasses in the fall, preemergence treatments must be applied at least 60 days before planting.