

There are three benefits to Echelon that most traditional preemergence herbicides do not provide.

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azon as a preemergent herbicide, but safe to apply as a postemergence herbicide as well. As a postemergence herbicide, sulfentrazone is fast-acting with control occurring within three days after treatment. It is primarily used to control sedge species postemergence, and is sold as Dismiss or Dismiss South (sulfentrazone plus imazethapyr) for enhanced purple nutsedge control.

Sulfentrazone has also been sold as mixtures with broadleaf herbicides (Q4 and Surge) to provide faster activity and as Solitaire (sulfentrazone plus quinclorac) for sedge, crabgrass and broadleaf weed control. Sulfentrazone is also unique in that it can potentially control goosegrass; ongoing research continues to demonstrate this added benefit.

Echelon is a prepackaged mixture of prodiamine and sulfentrazone developed to improve upon the weaknesses of traditional preemergence herbicides. Sulfentrazone has been used in row-crop agriculture for many years as an additive to dinitronaniline herbicides to improve preemergence sedge and broadleaf control. A similar type of control is expected and has been seen from Echelon.

As a professor at the University of Tennessee and now at Auburn University, I have conducted approximately 20 studies evaluating the usefulness of sulfentrazone in mixture with prodiamine (as is used in Echelon). In order to better understand its usefulness, it is easiest to simply compare Echelon to standard products.

First, from my data, Echelon offers similar control of crabgrass and *Poa annua* as traditionally used herbicides, such as Barricade. Both provide excellent control of these weeds when used at the proper rate; so if these weeds are your main target then either herbicide will work.

Having said that, there are three benefits to Echelon that most traditional preemergence herbicides do not provide. First, it provides added goosegrass control (Figure 1).

Goosegrass (*Eleusine indica*) is a later germinating annual grass species common in turfgrass. It typically germinates four to eight weeks after crabgrass germination. Using split application programs can

improve goosegrass control, especially if Echelon is used as the second application.

A second benefit from this program is the added preemergence broadleaf control. Typically, this mixture of prodiamine and sulfentrazone is better for winter annual broadleaf weed control, such as henbit and common chickweed, than summer annuals, such as annual lespedeza. Similar to goosegrass control, split application programs that include an initial application of Echelon or a traditional preemergence herbicide followed by Echelon can improve control of annual and non-tuberous sedges, such as annual flat sedge (*Cyperus compressus*) and globe sedge (*Cyperus globulosus*). By using Echelon as the second premerge application, sedges can germinate, thus allowing the product to provide pre- and postemergence activity. Echelon typically can provide burn back of these weeds, but control throughout the summer may dissipate.

A third benefit is pre- and postemergence sedge control (Figure 2). Similar to goosegrass control, split application programs that include an initial application of Echelon or a traditional preemergence herbicide followed by Echelon can improve control of annual and non-tuberous sedges. Using Echelon for the second application, sedges can germinate, thus allowing both pre- and postemergence activity. Echelon typically can provide burn back of these weeds, but control throughout the summer can dissipate.

The combination of prodiamine and sulfentrazone in Echelon brings some advantages to the turfgrass market for pre-emergence weed control. These benefits are best seen when Echelon is used in a split-application preemergence program as listed in Table 1.

As demonstrated in this article, Echelon provides similar benefits as traditional herbicides for general crabgrass and *Poa annua* control. However, it can improve weed control programs when used as a split application program for sedge and goosegrass control.

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