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2. GROOM IT

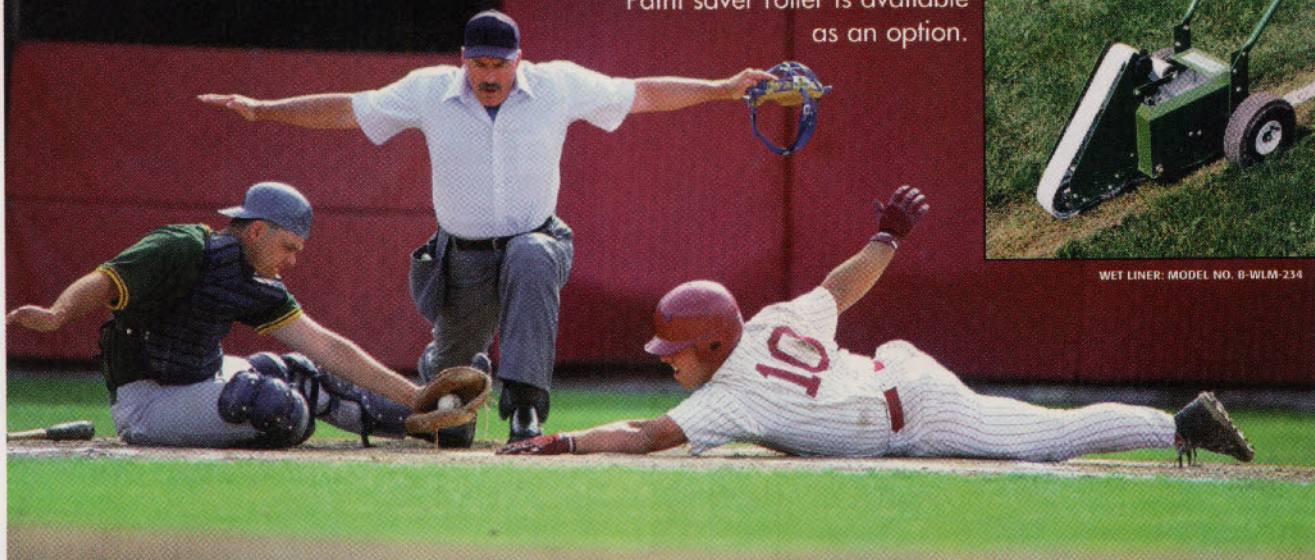
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3. LINE IT

The Bannerman **WetLiner** is a simple, practical tool for line marking of turf surfaces. Other wet liners spray, while our WetLiner paints each blade of grass to the ground for solid, longer lasting lines. Paint saver roller is available as an option.



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nutrients are applied (usually at low rates as foliar applications).

For turfgrass, however, these remaining micronutrients (boron, zinc, copper, molybdenum, chlorine, and nickel) do not need to be applied as supplemental fertilizers, as sufficient amounts are either: 1) already in the soil, 2) applied via dust, irrigation water or in topdressing sand, or, 3) applied via their presence in fungicides. Many fertilizers contain supplemental micronutrients, in granulated blends, or in organic materials. Check the back of a fertilizer bag for the guaranteed analysis; that's the legally required list that gives the percent fertilizer nutrient contents, and it provides the source from which the nutrient was obtained.

In conclusion, managing your micronutrients is pretty darned easy. Consider Fe applications for color, especially when you want to limit tissue growth. After that, if you are managing turf on new sand-based construction or very sandy soils, consider application of a fertilizer that contains a micronutrient package a few times a year. You'll be good to grow!

Dr. Beth Guertal is a professor of Turfgrass Soil Fertility, Agronomy & Soils, Auburn University. ■

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John Mascaro's Photo Quiz

Can you identify this sports turf problem?



Problem: Brown areas on football field sideline

Turfgrass Area: The Orange Bowl

Location: Miami, FL

Grass Variety: 419 Bermudagrass

**Answer to
John Mascaro's Photo
Quiz on Page 45**

*John Mascaro is President
of Turf-Tec International*



2653B

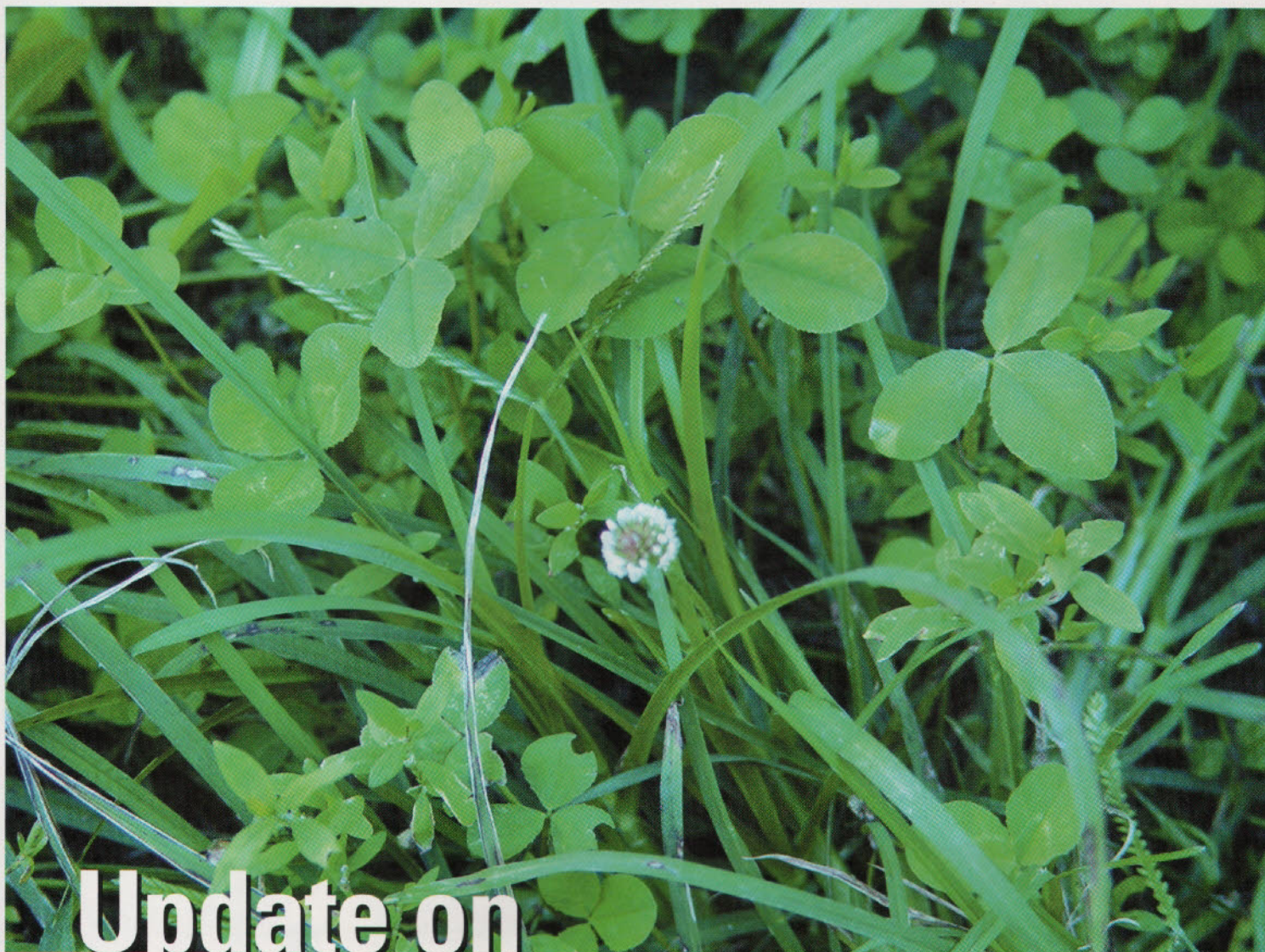
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Update on **FLUROXYPYR**

By Greg Breeden and Dr. Scott McElroy

When discussing troublesome weeds with turfgrass managers there will be different opinions on which weeds are the worst. However, most turfgrass managers will acknowledge that many of the troublesome weeds are broadleaf species. Controlling broadleaf weeds help turfgrasses develop a dense, uniform cover that resists further weed invasion, reduces mowing requirements, and improves the aesthetic appearance. On sports fields weed control also improves the safety and uniformity of playing surfaces.

White clover (*Trifolium repens*), ground ivy (*Glechoma hederacea*), and Virginia buttonweed (*Diodia virginiana*) are three of the most problematic broadleaf weeds in turf. White clover has leaves that are arranged in groups of three. The flower is a round white cluster. Most turf managers are familiar with white clover because of its widespread appearance under many turf conditions. White clover is a member of the legume family (*Fabaceae*). Members of this family can fix nitrogen, so it can survive in low nitrogen conditions.

Ground ivy is a member of the mint family (*Lamiaceae*) and has a

Above: White clover is one of the most problematic broadleaf weeds in turf.

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similar toothed edged leaf and a square stem as henbit (*Lamium amplexicaule*) and purple deadnettle (*Lamium purpureum*). Ground ivy has leaves that are nearly round and are arranged in an opposite pattern. It has creeping stems that root at the nodes. Flowers are small and often are a blue-violet color.

Virginia buttonweed has opposite leaves that often have a mottled yellow appearance that is caused by a virus that infects *Diodia* species. Stems are occasionally hairy and flowers are white in a star shape with four petals. Virginia buttonweed is probably the most difficult to control because it can produce rhizomes several feet in the ground and it produces viable under ground flowers that self

pollinate to produce seed. If you manage turf for very long you will have to deal with one or a combination of these three weeds.

When selecting a herbicide accurate identification is the first step in control. Once the weed or weeds are identified then the next step will be selecting a herbicide for controlling the problem weeds. This can also be somewhat confusing. There are several new herbicides labelled for broadleaf weed control in turf. Not to mention that many herbicides are premixes of several active ingredients. While most herbicides work good by themselves often the activity and spectrum of weeds can be increased when tank mixed.

Fluroxypyr is a new broadleaf herbicide

labelled for most turf situations. Fluroxypyr is the only active ingredient contained in Spotlight. This active ingredient acts in a similar manner to triclopyr and clopyralid, the active ingredients in Confront. Fluroxypyr is a systemic herbicide that is rapidly absorbed by the foliage of growing plants. Uncontrolled cell elongation and leaf and stem twisting are the symptoms of fluroxypyr, like those of other auxin-type herbicides. Fluroxypyr is also contained in the herbicide Escalade, along with 2,4-D, and dicamba.

Research was conducted in 2005 at the University of Tennessee to compare fluroxypyr products to standard products on tough to control broadleaf perennial weeds. The herbicides



Virginia buttonweed produces rhizomes several feet in the ground making it difficult to control.

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evaluated were Spotlight, Escalade, Confront, and Trimec Plus. Single applications were evaluated for control of white clover and ground ivy and sequential applications were evaluated for control of Virginia buttonweed. Sequential applications were used with Virginia buttonweed because of prior research indicating that for season long control they are needed. All trial locations had infestations of weeds that were well established. Herbicide application volume was 30 gallons per acre.

All treatments provided similar control of white clover except the lower rate of Spotlight. Escalade, Confront, and Spotlight at the higher rate (2 pt/a) provided excellent control (> 99%) of white clover at 6 weeks after application. When the rate of Spotlight was decreased (1 pt/a) white clover control decreased by 10%.

Similar results were seen for ground ivy control however, the decrease in control when the rate decreased was more drastic. The higher rate of Spotlight (2 pt/a) provided excellent control (95%) of ground ivy at 6 weeks after application, but the lower rate of Spotlight (1 pt/a) provided unacceptable controlled (66%) of ground ivy at the same rating date. All other treatments provided control of ground ivy equal to the higher rate of Spotlight.

A different approach was taken when evaluating Virginia buttonweed. Sequential applications were evaluated for Virginia buttonweed



Ground ivy leaves are nearly round.

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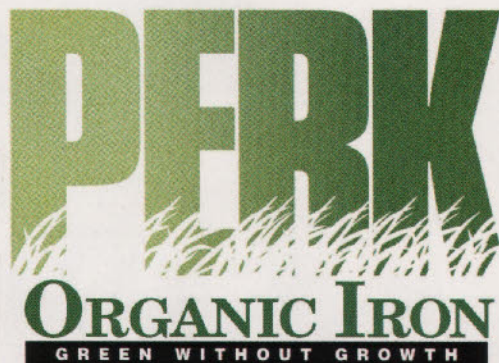
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Herbicide Rating Chart

Herbicide	Active Ingredient	Product Rate/Acre	Ground Ivy	Virginia Buttonweed	White Clover
Confront	triclopyr + clopyralid	1-2 pt.	Good	Excellent	Excellent
Escalade	fluroxypyr + 2,4-D + dicamba	0.67-3.0 pt.	Good	Good	Excellent
Spotlight	fluroxypyr	0.67-2.5 pt.	Good	Fair	Good
Trimec Plus	MSMA + 2,4-D + MCPP + Dicamba	1-1.7 gal.	Good	Fair	Good

KEY TO WEED CONTROL CODES: Excellent (90 to 100%); Good (80 to 90%); Fair (70 to 80%); Poor (less than 70%)

control, due to the fact that it is one of if not the most difficult to control broadleaf weeds. Sequential applications of herbicides with fluroxypyr and clopyralid provided good to excellent control ($\geq 90\%$) of Virginia buttonweed at 6 weeks after the sequential application. Herbicides with one of these two active ingredients (fluroxypyr and clopyralid) are important components for control of Virginia buttonweed. Fluroxypyr is contained in Spotlight and Escalade and clopyralid is contained in Confront. These were the top three treatments for Virginia buttonweed in this research. Sequential applications of Trimec Plus provided fair

control (80%) of Virginia buttonweed at the same rating date.

These products compared equally to or better than industry standards and both were safe on the turf species evaluated. With any hard to control perennial regrowth is likely to occur overtime. But with persistent monitoring and timely applications control of these can be achieved.

Greg Breeden is extension assistant, University of Tennessee; Dr. Scott McElroy is a turfgrass weed scientist at UT in Knoxville and SportsTurf's Technical Editor. ■

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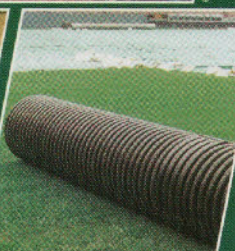
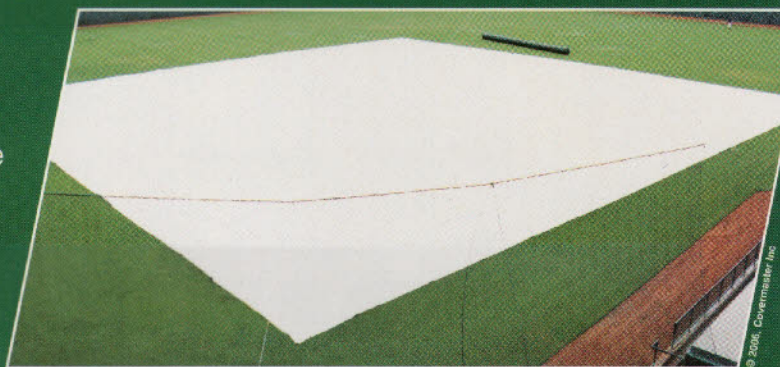
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