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relief. Keep in mind, however, that the insect is still very sporadic, so treat only when adult monitoring or turf samples have confirmed the presence of the insect.

### Western chinch bug

There are more than 20 species of chinch bugs (all in the genus *Blissus*) in the United States and Canada.

The hairy chinch bug (*B. leucopterus hirtus*) is found throughout the eastern United States and the Southern regions of the eastern Canadian provinces and extends west as far as Minnesota. It is a significant pest of forage and pasture grasses, as well as most cool-season turfgrasses. The southern chinch bug (*B. leucopterus insularis*) occurs from southern North Carolina through Florida and into eastern Texas. It is generally considered the most destructive insect pest of St. Augustine grass. It also attacks several other warm-season grasses, as well as corn, rice, and crabgrass. The range of the common chinch bug (*B. leucopterus leucopterus*) overlaps that of the hairy chinch bug and the southern chinch bug. It feeds on corn, sorghum, millet and rye, but also feeds on both cool-season and warm-season grasses.

The western chinch bug, *Blissus occidentus*, was formerly called the buffalograss chinch bug, but recent observations have confirmed that it feeds on many plant species, including zoysiagrass and various forage and crop species, so the broader name is more appropriate.

This species occurs in much of the central United States and the Plains provinces of

Canada. Although it is a relatively small chinch bug, life stages are similar to those of other chinch bug species. There are two distinct wing conditions in the adults, as some have very short wings and others have more normal-appearing wings.

The western chinch bug has two generations a year on buffalograss in Nebraska. Adults emerge as early as mid-March, with first generation nymphs feeding from early May through early August. New young adults normally emerge in late June and second-generation nymphs are active from early July through autumn. Control strategies often are similar to those of other chinch bugs, but timing of application varies with local climatic conditions.

### Crane flies

The European crane fly (*Tipula paludosa*) and the common crane fly (*Tipula oleracea*) have been established in the Pacific Northwest (including British Columbia) and the Canadian Maritimes for several years. They are a pest of lawns, golf courses and pastures.

Crane flies are more likely to be active in areas where soils are moist or even saturated at certain times of the year. More recently, populations became established on the Niagara Peninsula west of Toronto.

Dan Peck, turf entomologist at Cornell University, reported that both species also appeared in western New York during the summer of 2004. (Note that *T. paludosa* is also sometimes called the marsh crane fly, and it is that name that is

being used in New York and Ontario.) Some lawns had as many as 50 larvae per square foot. Most of the crane fly activity in this area occurs in turf areas that are irrigated regularly. In addition, 2004 was an unusually wet summer in much of the

Northeast, providing conditions that were more conducive to crane fly activity.

At this point, it is difficult to project how widespread the problem will become in the Northeast. If wet summers become the norm, it is more likely the problem will spread.

European crane flies have one generation per

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The chinch bug feeds on cool-season turfgrasses.



There are more than 20 species of chinch bugs in the United States and Canada.



PHOTOS: UNIVAR USA



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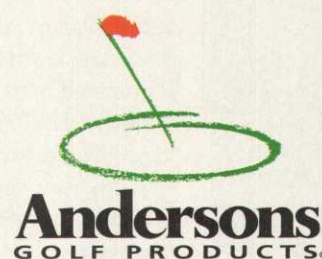




PHOTO: UNIVAR USA



**Populations of crane flies recently became established on the Niagara Peninsula, west of Toronto.**

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year, with adults active in late summer, often in large numbers. They lay eggs almost immediately, which hatch into small larvae. These "leather jackets" are almost cylindrical but slightly tapered at each end. They normally are a grayish-green and have black specks scattered on the body. They feed on roots, root hairs and crowns. There are four instars, the first two of which occur in autumn. In areas where soil temperatures remain above freezing, larvae (as third instars) may feed through the winter months.

They molt to the fourth and final stage by April and feed vigorously for about a month. They then are dormant until late July, when they pupate briefly. The adult stage follows quickly. In March and April, large larvae migrate to the surface at night and cause significant mechanical damage in addition to direct feeding on roots (Vittum et al. 1999).

The common crane fly has two generations per year in the Pacific Northwest. It lays eggs in March or April and again in August through October. Current control efforts are concentrated in autumn (October or November) in areas where soil temperatures remain mild, with the intent of eliminating young larvae of both species before they molt to larger stages.

### White grub complex

White grubs (larvae of various scarab beetles, such as the Japanese beetle, oriental beetle, European chafer, northern and southern masked chafers and Asiatic garden beetles) have been active in many parts of the eastern United States for years. Until recently, the Japanese beetle dominated most turf settings in the Northeast, while masked chafers were more common from Pennsylvania west to the Mississippi River.

Now, however, many turf managers in the Northeast may be dealing with three or more species on a single property. Management is

much more complicated in these situations, because the life cycles are slightly different, as are behaviors and susceptibility to insecticides.

The European chafer is much less sensitive to cold temperatures, so grubs remain in the root zone feeding into late fall and return to the root zone in late February or early March in many years, even in southern New England. The life cycle is about two weeks earlier than the Japanese beetle, so applications made targeting the Japanese beetle may be too late to be effective against the European chafer.

In addition, the species is somewhat less vulnerable to insecticides than is the Japanese beetle. European chafers are spreading through much of New England and are found around Lake Erie.

### Other miscellaneous beasts

There are several other insects and related critters that are becoming active in new areas or have recently emerged as pests.

Earthworms aerify the soil and improve soil structure in many settings and are generally considered to be beneficial organisms. However, they are sometimes viewed as pests in fine turf areas (e.g., golf course fairways) because of the castings they create. These casts can smother and kill grass and can cause damage to mowers.

Other emerging pests include ants (and the mounds they form) on golf course turf, sugar cane grubs (in southern Florida) and ground pearls in some irrigated lawns in Arizona.

In many cases there is a distinct lack of information about the life cycles or ecology of these pests, so control efforts are haphazard at best.

*Patricia J. Vittum has been on the faculty at the University of Massachusetts for 25 years. She teaches two courses a year (Turf Insects in the spring; Pesticides and the Environment in the fall). Her applied research concentrates on the ecology and management of white grubs and annual bluegrass weevils.*

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Bayer Environmental Science

#### QUICK TIP

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# A Transition Success Story At Desert Mountain

By Fred Yelverton

*The Desert Mountain course shows the beauty of perennial ryegrass overseeding.*

**D**esert Mountain is a private golf course community in northern Scottsdale, Ariz., that has six Jack Nicklaus Signature courses. The turf species at Desert Mountain are typical of the area — Tifway bermudagrass on tees, fairways and roughs and creeping bentgrass putting greens.

Like many courses in the desert Southwest, a vast majority of member play occurs from November through May of each year. Because of this, the bermudagrass is overseeded each fall.

As is typical in the Southwest, perennial ryegrass overseeding rates are high (typically in the 600 pounds per acre range, although many other courses in the Phoenix area use higher rates) and the bermudagrass is aggressively scalped just prior to overseeding to prepare a good seedbed for the perennial ryegrass.

Shawn Emerson, director of agronomy at Desert Mountain, overseeds five of the six courses, and overseeding dates range from mid to late September through mid-October. Perennial ryegrass growth must be aggressively promoted in order to re-open the courses for member play between late October to mid November.

Perennial ryegrass growth and the resulting

appearance on the overseeded golf courses is striking. The desert climate with high light intensities, warm winter temperatures and low humidity results in very healthy perennial ryegrass. The perennial ryegrass fairways, tees and roughs, with the desert landscape as a backdrop, provide for some of the more beautiful golf course scenery anywhere in the world. The aesthetics, along with ideal playing conditions that include very healthy bentgrass putting surfaces, combine for great winter golf.

Then the month of June arrives. Late spring and early summer is an interesting time for turfgrass management in the desert. Temperatures can often reach triple digits in the day but cool down significantly at night. In addition, the relative humidity during the day is extremely low and often in single digits.

Evapotranspiration rates are also very high during this time of year. As a result, the perennial ryegrass continues to thrive even as daytime temperatures climb into the 90s and low 100s. Bermudagrass wants to green up and grow, but the perennial ryegrass is still very healthy and provides a thick canopy over the bermudagrass.

Because bermudagrass is highly intolerant of



shade, the health of the underlying bermudagrass starts to rapidly decline. As July approaches, day temperatures continue to climb but night temperatures still drop considerably with humidity levels remaining low. The bottom line is perennial ryegrass continues to thrive and the bermudagrass health continues to decline.

In the Scottsdale area, perennial ryegrass will continue to survive through July and often into August. At that time, higher humidity coupled with routine daytime temperatures in the 100s results in perennial ryegrass death. That is where the problem arises.

Perennial ryegrass in the Scottsdale area can grow about 11 months of the year. If it is allowed to remain in without removal with herbicides, the underlying bermudagrass can die. By August the canopy shading from perennial ryegrass has been so intense that bermudagrass either thins significantly or completely dies. Shading of bermudagrass by perennial ryegrass is exacerbated in roughs where the higher mowing heights result in more canopy shading of bermudagrass.

This is the problem for many courses in the Scottsdale/Phoenix area. Aesthetics and winter playing conditions are great, but once the perennial ryegrass dies in August, the underlying bermudagrass is thin due to competition from perennial ryegrass. This problem progresses over time. After several years of heavy overseeding and allowing the perennial ryegrass to die naturally, the bermudagrass is nonexistent on many areas of the golf course.

At Desert Mountain, Shawn Emerson was

interested in reversing this trend of losing bermudagrass. Because an increasing number of members were staying in the summer, the membership at Desert Mountain was interested in improving summer playing conditions.

In addition, Emerson and the agronomic staff at Desert Mountain understood that a healthy bermudagrass base would make overseeding easier.

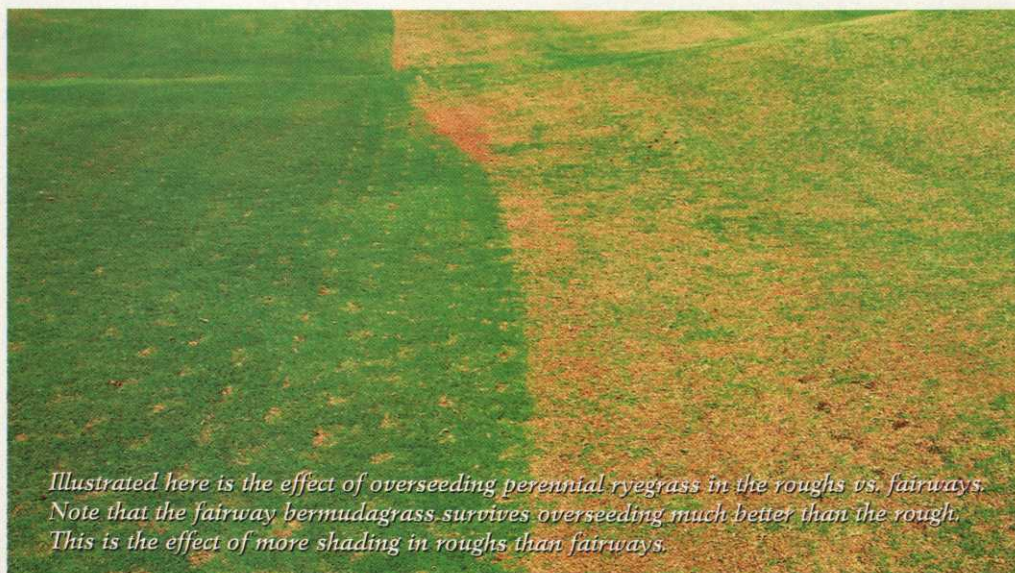
For instance, it is much easier to grow perennial ryegrass in a healthy bermudagrass base than it is on bare ground. In addition, the staff

### Tracking of these products onto bentgrass greens is a concern.

also understood that a healthy bermudagrass base and the resulting healthy perennial ryegrass stand would help reduce problems with annual bluegrass (*Poa annua*).

In cooperation with Emerson and his staff, an aggressive management plan was initiated to re-establish bermudagrass on the five overseeded courses. This was a three-year plan because all interested parties realized that recovery of the bermudagrass could not take place in one year. The plan was comprehensive and included issues such as fertility, water quality, plant growth regulators and mowing heights. However, the most significant part of the management plan included transitioning the perennial ryegrass out with herbicides in late spring/early summer.

*Continued on page 78*





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*Continued from page 77*

The plan was initiated in the fall and winter of 2002-03. The objectives of the three year plan were essentially met after two years, which was one year ahead of schedule. With bermudagrass successfully re-established, the membership and club management have justifiably recognized and praised Emerson and the agronomic staff at Desert Mountain.

**New herbicides.** As previously mentioned, the most significant part of re-establishing bermudagrass at Desert Mountain was getting rid of the perennial ryegrass before it would voluntarily die. The objective was to use herbicides to remove the perennial ryegrass as the bermudagrass was attempting to grow in late spring/early summer.

The goal at Desert Mountain was to provide bermudagrass 100 days of growth without perennial ryegrass competition.

With overseeding dates from late September to early October, the perennial ryegrass needed to be completely gone by about mid to late June. This would provide the needed 100 days for bermudagrass recovery. Even though bermudagrass does not grow as much in late June and early July in the desert as it does in August (when humidity is higher), removal of the ryegrass allows the bermudagrass to green up and begin to initiate its growth. More importantly, however, removal at this time prevents bermudagrass from dying.

In the spring of 2003, foramsulfuron

(Revolver) was registered and available for use on golf courses. Revolver belongs to a relatively new class of herbicides called the sulfonylureas (sometimes referred to as SU herbicides).

Prior to release of this product, another sulfonylurea, metsulfuron (Manor or Blade), was available for use. Rimsulfuron (Tranxit) was also available but was not registered in the state of Arizona at that time.

From previous research, it was known that Revolver would selectively remove the perennial ryegrass very rapidly. Typically, it kills ryegrass in 10 days to 21 days whereas Manor or Blade take a little longer (20 days to 28 days). The advantage Revolver provided was that it allowed the Desert Mountain agronomic staff to leave the perennial ryegrass in longer because it kills the ryegrass faster.

In addition, Revolver also kills annual bluegrass whereas Manor or Blade do not.

In the spring of 2003, Revolver was used extensively at Desert Mountain. The rate utilized was 18 ounces of product per acre (0.4 ounces per 1,000 square feet). Timing of application varied depending on which of the five courses management wanted to remain open. But the objective was to provide 100 days (or as close to that as possible) of bermudagrass growth without perennial ryegrass.

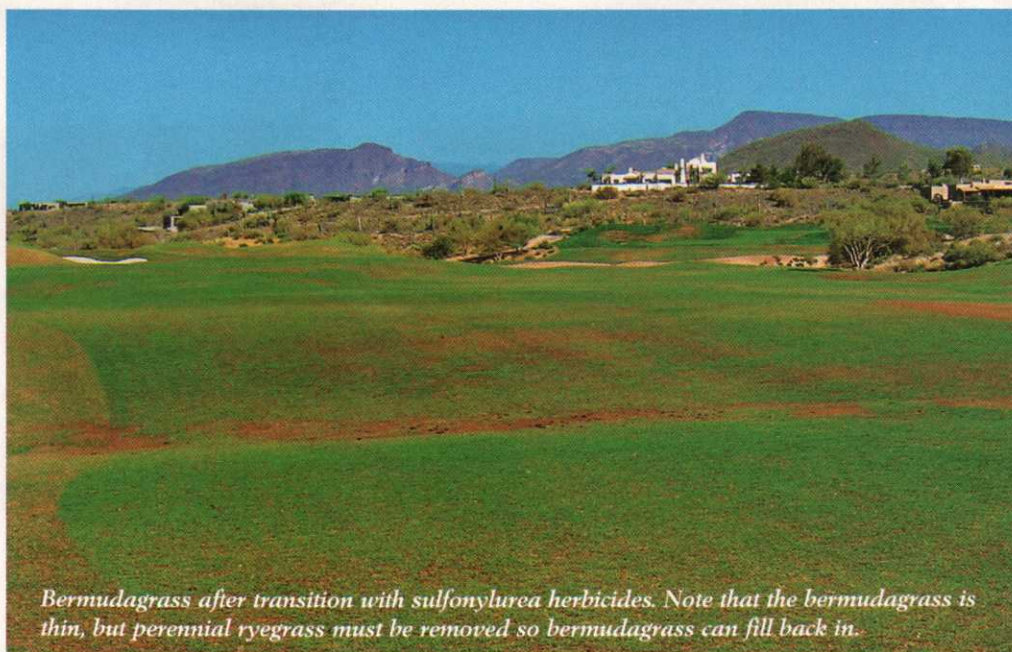
Once the perennial ryegrass was completely dead, the overall health of the bermudagrass was easily evaluated. In many areas on the golf course, sprigging, seeding and sodding had to

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**TORO**

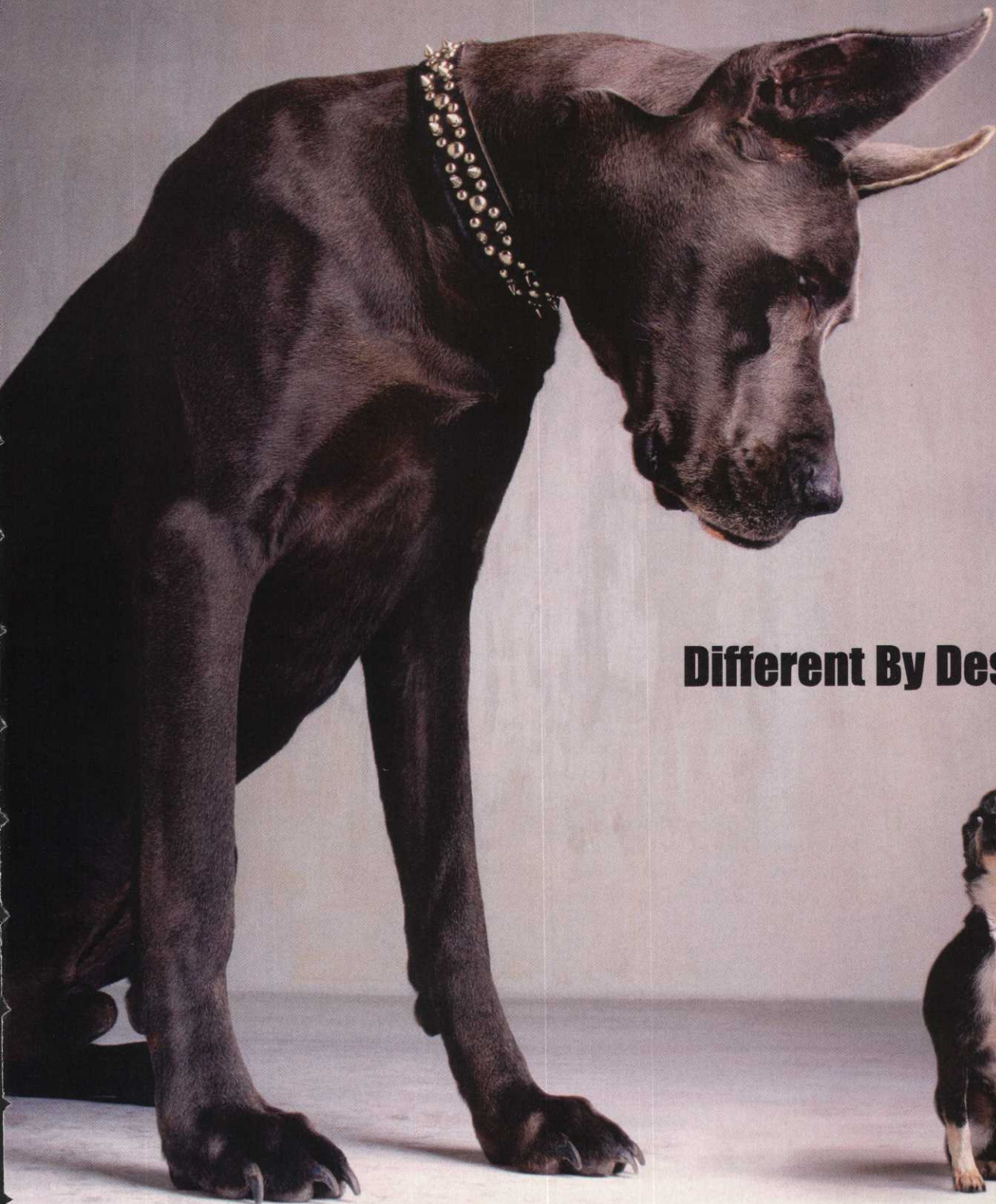
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*Bermudagrass after transition with sulfonylurea herbicides. Note that the bermudagrass is thin, but perennial ryegrass must be removed so bermudagrass can fill back in.*





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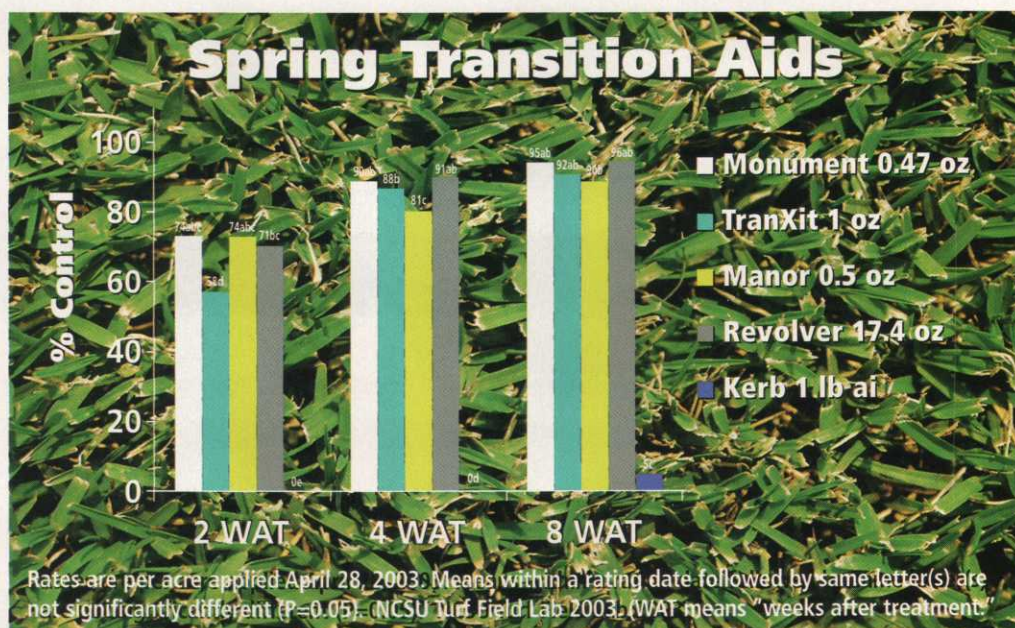
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*Continued from page 78*

take place. In many areas, the bermudagrass did not look very good but management and the members had been warned that it would look bad during the early stages of this management plan. Management had to be reassured that this was the correct course of action to take. However, the recovery of bermudagrass by the end of the first summer was dramatic.

By the time fall overseeding was to take place in 2004, everyone knew the management plan was working and it was just a matter of time before the bermudagrass completely recovered.

During the spring of 2004, the decision to spray out the ryegrass was much easier to sell. Also, during the winter of 2003-04, trifloxysulfuron (Monument), another sulfonylurea herbicide, was registered for use. Monument was used on one of the five golf courses, and results similar to Revolver were obtained.

Tranxit has also received a registration in Arizona and has performed well in tests at Desert Mountain. All three (Revolver, Monument and Tranxit) are effective in killing perennial ryegrass and annual bluegrass. However, precautions need to be taken to prevent lateral movement of these products onto bentgrass putting greens.

In addition, tracking of these products onto bentgrass greens is another concern. To prevent lateral movement, these products should not be applied up-slope and in close proximity to bentgrass greens.

To prevent tracking, these products should

be applied after golfers and equipment have left for the day. In addition, because dew can re-suspend the herbicide overnight, a light irrigation is recommended prior to golf or equipment traffic the following day. By the end of the summer of 2004, the bermudagrass had essentially recovered with the exception of some very small areas. Year three of the management plan (summer of 2005) will be just a matter of growing in these few small areas.

Many golf courses in the Scottsdale area have adopted the Desert Mountain practice of aggressively removing the perennial ryegrass with the new sulfonylurea herbicides. Other courses are starting to see the benefit of removing the perennial ryegrass.

Without the use of herbicides, it is doubtful that bermudagrass can be sustained in the Scottsdale area when routinely overseeded.

*Fred Yelverton, Ph.D., is a professor and extension specialist in turfgrass at North Carolina State University in Raleigh.*



#### QUICK TIP

**Drought or flood:** Moisture must be managed despite Mother Nature's fickleness and individual soils' characteristics. Pervade, Retain Pro, and Retain Max are cost-effective tools that provide managers flexibility to insure the rootzone has adequate but not excessive moisture.

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