Postemergence Weed Control: Helping Turf On The Rebound

Dallisgrass. Photo courtesy: Max E. Badgley.

To a sports turf manager, weeds in a new or renovated turf area are like the first dent in a new car. After all the time and work spent to obtain a flawless product, suddenly the glow of achievement fades into the sobering prospect of making payments for the next few years for something that isn't as special as it was the day it was new.

You can't keep a new car in the garage all the time and you can't keep athletes off sports turf. They are both built to be used for important purposes, and only regular maintenance can keep them looking and performing like new. The day you stop maintaining turf is the day the weeds move in. Without weed control, a field or golf course that could last forever falls apart in just one season. To make another automotive analogy, we aren't talking about a little old lady's car in sports turf, we are talking about a commercial vehicle with heavy use under tough operating conditions. The turf is gouged and trampled, mowed low, aerated, verticut, played on when injured or dormant, and grows in soil that is often compacted. Yet, with proper care and use, it rebounds within days for its next event.

Particular weeds find the worn patches of high-use turf suited to their own establishment and growth. They thrive on compacted soil where the turfgrass has been opened up or thinned with play. Weed seed lies dormant in the soil waiting for a golf club, cleats or elbow to clear its path to the surface for germination and growth. Frequently, when temperature and moisture conditions are optimum for weed seed germination, use of the playing surface is at its greatest.

Extension turf specialists will tell you the best defense against weeds is a dense, healthy turfgrass. All plants compete for space. Once established, the heathiest and most aggressive plant wins the battle.

A significant challenge to the sports turf manager occurs when a sports season takes place while the primary turfgrass is either dormant or under stress from heat or drought. For northern climates, this takes place during the late fall and winter, when Kentucky bluegrass, ryegrass, tall fescue and bentgrass grow very slowly if at all.

High summer temperatures and drought can also hurt the competitiveness of cool-season turf in the North or Central (transi-

The grass sandbur. Photo courtesy: Max Badgley.

tion zone) regions. In the South, the warm-season grasses enter dormancy beginning in October and do not become aggressive again until April or May.

For these reasons, warm-season grasses in the South are frequently overseeded in the fall. Sports turf managers in the transition zone and parts of the upper South are utilizing cold-tolerant bermudagrasses, such as Midiron, or turf-type tall fescues to reduce weed invasion during the summer. In all parts of the country, irrigation systems are a vital part of summer weed control since even a two-week dry spell can favor the encroachment of weeds.

Perennial ryegrass has become a major factor in maintaining cover and turf dominance over weeds in much of the country. It is the primary grass for winter overseeding in the South. Because it germinates so rapidly, it is also used heavily in other parts of the country to fill in thin or bare spots on golf tees, football fields and soccer fields. Wear tests in England and at various universities across the United States have shown that certain perennial ryegrasses stand up to sports extremely well once established.

Sports turf managers and golf course superintendents who use perennial ryegrass to overseed warm-season grasses should select varieties with low heat tolerance. Ryegrass can be considered a weed in warm-season grasses if it competes too strongly with bermudagrass or other warm-season grasses as they come out of dormancy in the spring. However, late spring golf tournaments, baseball and soccer seasons have forced some sports turf managers to maintain the ryegrass through May.

Since overseeding and reseeding are so important to maintaining aggressive turf, sports turf managers must either time applications of preemergence herbicides very carefully or depend completely upon postemergence herbicides for weed control. See the story in the February issue on "Scheduling Preemergence Weed Control."

The primary times to apply preemergence applications are in the spring and late summer. Unfortunately, these are also the best times for sports turf managers to fit overseeding and reseeding into their work schedules. All preemergence herbicides, except siduron (Tupersan), will affect turf seed germination.

If *Poa annua*, annual bluegrass, is not a major problem, weed control specialists suggest sports turf managers forgoe fall applications of preemergence herbicides and to do as much spring renovation and reseeding in the fall instead of the spring. Then they can utilize preemergence herbicides in the spring, when weed seed germination is most severe.

Renovation and overseeding common bermudagrass fields and fairways in the late spring should also be scheduled after preemergence herbicides in the soil have been exhausted. In most cases, herbicide residues in the soil are below control levels after 30 to 60 days. Always check the label; the length of weed control varies according to rates and products used.

Even with preemergence applications, surface damage caused by sports activity can create openings in the herbicide barrier in the soil. Furthermore, some major weeds continue to germinate through the spring and summer, long after their peak germination period in late winter or spring. As a result, postemergence herbicides remain very important. Fortunately, the types of weeds that commonly invade sports turf can be narrowed down to a few by extension turf specialists. They can recommend effective control measures for nearly all of the primary weeds.

A convenient way to look at weeds also exists. All plants can be divided into two groups, annual or perennial. Annual weeds live for one year and reproduce by seed. Examples of annual weeds are annual bluegrass, crabgrass, knotweed, henbit, fox-

continued on page 26

continued from page 25

tail, prostrate spurge, henbit and lambsquarters. Each year these plants flower and produce seed for the next generation. This seed falls to the ground, where it may lie dormant for months or even years.

Perennial weeds live for more than one year (biennials live for two years) and reproduce both by seed and vegetatively. Vegetative reproduction is growth of new plants from parts of old plants, such as roots, stolons, rhizomes, bulbs and tubers. Examples of perennial weeds are goosegrass, nutsedge, dandelion, dallisgrass, clover, chickweed, wild garlic, oxalis, Virginia buttonweed, yellow wood sorrel, and quackgrass.

While preemergence weed control can prevent seed in the soil from germinating, postemergence weed control can kill the weed before it produces more seed. By sterilizing soil prior to planting, weed seed and reproductive plant parts in the soil can be destroyed. Nature eventually restores the bank of weed seed in the soil with seed blown onto sports turf from adjacent sites, deposited by birds, or tracked in on shoes.

Perennial weeds can invade an area as seed first, then get a foothold by spreading vegetatively. Only recently have new herbicides been developed that can control the vegetative structures of some major perennial weeds.

For control purposes, weeds are further distinguished as either broadleaf or grassy. Herbicide manufacturers have created products to selectively remove broadleaf weeds and grassy weeds from desirable grasses. The phenoxies, including 2,4-D, MCPP (mecoprop), and 2,4-DP (dichlorprop), and dicamba (Banvel) have long been used effectively for broadleaf weed control. Triclopyr (Turflon) is relatively recent addition to the line of broadleaf herbicides for turf.

Two-, three- and four-way combinations of these products are available commercially today for broad-spectrum broadleaf weed control. A few examples are Trimec, Trex-San, Weedone DPC, Triamine, Lesco Three-Way and Turflon-D. Generally, these herbicides should not be used soon before or soon after seeding. Bromoxynil (Buctril) is a selective broadleaf herbicide that can be used shortly after seeding.

The arsenates, including MSMA, DSMA and CMA, have been the backbone of grassy weed control for many years. While they control most annual grassy weeds, they are not effective long-term on perennial grassy weeds.

Sports turf managers have been able to use systemic grassy herbicides such as bentazon (Basagran) and imazaquin (Image) to control the vegetative structures of major perennial grassy weeds. Other products which have helped control of grassy weeds are metribuzin (Sencor), fenoxaprop-ethyl (Acclaim), ethofumesate (Prograss) and pronamide (Kerb).

In dormant turf, postemergence nonselective herbicides are being used to control winter weeds which stand out as green patches in otherwise tan turf. TAG and cacodylic acid kill the exposed green foliage of weeds active in the winter. Glyphosate (Roundup) moves inside the weed to kill the foliage and the roots. A second advantage of glyphosate is that it lasts only a few days and is deactivated upon contact with soil. After a week, seed can be planted without any harm from residue. Heavily weed-infested turf areas can be chemically renovated in this manner.

Each region of the country has certain weeds that frequently invade sports turf. The rest of this article is devoted to advice from extention turf specialists and other experts from across the country. They focus on weeds that are found in sports turf in their area during the summer and those that are common in the winter.

For 30 years, Dr. Richard Skogley has dispensed turf advice at the University of Rhode Island in Kingston. The weed that has been causing the most problems lately in ryegrass and Kentucky bluegrass sports fields and fairways is knotweed. The broadleaf weed excels in compacted, worn turf near cart paths, on soccer goal boxes and in the center of football fields.

"What makes knotweed so hard to control," explains Skogley, "is it germinates before crabgrass. Sometimes it's already

up and growing before all the snow melts. Preemergence applications timed for crabgrass will miss germinating knotweed. Fortunately, dicamba is very effective on knotweed. The fact that fields have knotweed indicates that more fields are needed to carry the load."

Timing is not the only problem with preemergence weed control for knotweed and crabgrass. Long rainy periods in the spring extend the germination of crabgrass beyond the residual life of the herbicides. Skogley states that applications of three-way herbicides containing dicamba effectively knock out knotweed, crabgrass, dandelion and plantain in sports turf.

However, most schools renovate their fields in the spring instead of the fall. For them, Skogley recommends applying siduron for preemergence weed control and dicamba for the knotweed a few weeks prior to renovation. Once the turf is reseeded, applications of bromoxynil (Buctril) will control young broadleaf weeds without harming the ryegrass or bluegrass.

Yellow nutsedge. Photo courtesy: Larry Leuthold.

According to Skogley, golf course superintendents are using fenoxaprop (Acclaim) in combination with 2,4-D to control annual bluegrass and a variety of other weeds in ryegrass in the late spring. "Poa is a big problem here, largely in areas that are overirrigated, compacted, poorly drained, and have grasses that aren't adapted to sports in Rhode Island, such as fine fescue and tall fescue," adds Skogley. "More and more superintendents are realizing that poa infestation is related to management. They can see that too much water, too much fertilizer and mowing too close are encouraging the weed." Since poa germinates in the fall, Skogley urges superintendents to fit applications of preemergents around fall renovation.

Prostrate spurge is an annual broadleaf weed that invades some heavily used turf areas in July and August. Skogley says that the preemergence herbicide pendamethalin and the postemergence herbicide dicamba make control of prostrate spurge effective in Rhode Island.

Knotweed is also a problem in Kansas, says Larry Leuthold, at Kansas State University in Manhattan. Phenoxies can kill young knotweed early in the spring, but dicamba is needed later in the season. "Knotweed is a good indicator of compaction," states Leuthold. "Part of control should be more management to correct compaction." Oryzalin (Surflan) and DCPA (Dacthal) do a good job as preemergents on knotweed if you get them down early enough, he adds.

In addition to crabgrass, foxtail and common broadleaf weeds, Leuthold is especially concerned about grass sandbur and puncture vine. Both form spiny burs in late spring that are painful to players when they fall on the weeds. "You have to control these weeds before the burs form," he says. "Once they form, you can kill the plant, but the burs dry out, get hard and really hurt when you fall on them."

Sports turf managers can control grass sandbur, foxtail and crabgrass together with repeat applications of MSMA or DSMA. In cool-season turf, fenoxaprop (Acclaim) can be combined with preemergence herbicides to control all three weeds. Goosegrass is another grassy weed that is effectively controlled with fenoxaprop. However, fenoxaprop can't be applied to bermudagrass. Trimec-type herbicides will take care of the puncture vine.

Yellow nutsedge is a hard-to-control weed in Kansas sports turf. Applications of MSMA will knock back the foliage but won't kill the reproductive nutlets in the soil. Professional

continued on page 28

continued from page 27

applicators can use the systemic herbicide bentazon (Basagran) to kill the nutlets.

Kansas, being in the transition zone, has a variety of turfgrasses on its fields and golf courses. Leuthold says that while most golf courses have bluegrass/ryegrass fairways, a growing number of courses are experimenting with zoysiagrass. Golfers like the zoysia because it holds the ball upright more than bluegrass. However, the zoysia is slow to establish, fills in divots slowly, and has a long dormant season. Because zoysia is so dense, overseeding with ryegrass is difficult. Glyphosate is used to control winter weeds in both dormant zoysia and bermudagrass in the state.

"Don't assume the turf is dormant," says Leuthold. "Check the undergrowth to make sure the stems and tillers aren't still green." Midiron bermudagrass is a winter hardy bermudagrass developed at Kansas State University with a relatively short winter dormancy. The majority of athletic fields in the state are tall fescue with a trend toward perennial ryegrass. A growing problem is bermudagrass invading cool-season turf, especially turf in full sun. At the present time, the only way to correct the situation is to chemically renovate the invaded area with glyphosate and to reseed. Leuthold points out that water used to apply glyphosate must not be muddy. Even dusty turf will reduce the effectiveness of the material.

Prostrate spurge. Photo courtesy: Larry Leuthold.

As in Rhode Island, prostrate spurge invades heat- and drought-stressed cool-season turf in Kansas during the summer. Leuthold recommends Trimec-type herbicides for postemergence control of spurge and applications of either pendamethalin or oxadiazon (Ronstar) for preemergence control. An occasional weed in sports turf is wild violet. Leuthold suggests triclopyr plus 2,4-D (Turflon-D) to control it.

Leuthold's neighbor, Dr. David Minner at the University of Missouri in Columbia, says many weed problems can be avoided during spring renovation. Nutsedge, carpetweed and goosegrass take advantage of fields opened up for renovation or resodding. "If you try to seed in May, you'll get lots of goosegrass," says Minner. If late spring seeding is unavoidable, he recommends applying siduron (Tupersan) before seeding followed by applications of bromoxynil and/or fenoxaprop.

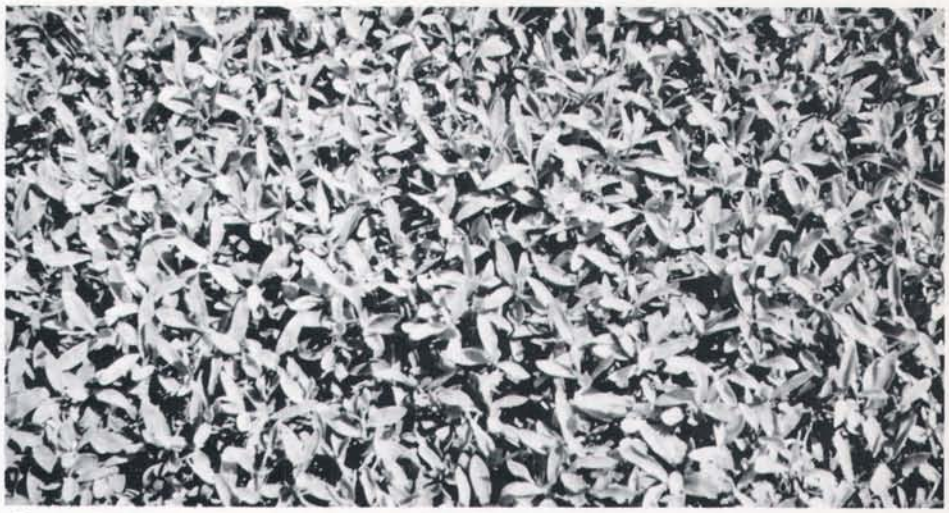
Bromoxynil controls the broadleaf weeds,

including knotweed, that emerge, and fenoxaprop will take care of goosegrass, crabgrass, foxtail and some broadleaf weeds in ryegrass or tall fescue turf. Yellow nutsedge control is best accomplished by two applications of bentazon, one in early June and a repeat application later in the summer.

There is no effective preemergence control of dallisgrass, says Minner. For the time being, multiple applications of MSMA must be made where the weed is a problem. Prostrate spurge is a common problem but is controlled effectively with late spring applications of Trimec-type herbicides and preemergence herbicides earlier in the year.

"The number one technical problem in the South Central U.S.," reports Dr. Euel Coates at Mississippi State University, is a perennial, subtropical flower called the Virginia buttonweed. The summer weed spreads vegetatively and by seed. So far, ester formulations of combination postemergence herbicides, such as Weedone DPC Ester, Super Trimec and Tri-Ester, will knock the buttonweed back for four weeks to two months. The problem often crops up on tees or when a superintendent widens a green into a collar area. Buttonweed survives short cutting height and thrives on high moisture. Coates says a more effective product is needed to get full control of the weed.

Control of prostrate spurge is improving, says Coates, as sports turf managers start using surfactants with postemergence combination herbicides containing MCPP. Weak turf encourages spurge and yellow wood sorrel, another summer broadleaf weed controlled fairly easily with three-way or two-way herbicides containing both 2,4-D and 2,4-DP.



Knotweed. Photo courtesy: Larry Leuthold.

Summer grassy weeds on Coates' "hit list" are goosegrass, crabgrass, and purple nutsedge. Goosegrass control in warm-season turf is improved by combining MSMA with metribuzin (Sencor) and a surfactant. The application should be repeated five to seven days later.

Purple nutsedge was very difficult to control with MSMA, but a new herbicide, imazaquin (Image), has brought it under control. A combination of MSMA and imazaquin will kill both the foliage and the nutlets, as well as some broadleaf weeds, such as sandbur and wild garlic. Imazaquin is not for use on cool-season grasses or bahiagrass.

Coates points out that economical control of some fall and winter germinating weeds in non-overseeded turf is possible with the preemergence herbicide simazine

continued on page 30

Foxtail. Photo courtesy: Larry Leuthold.

Postemergence Weed Control
continued from page 29

(Princep). Split applications of simazine can provide control of poa, henbit, chickweed and some clovers from October through April. He prefers controlling winter weeds in dormant turf this way as opposed to glyphosate.

Dallisgrass control is just as tough in Mississippi as it is in Missouri and Kansas. Sometimes six applications of MSMA are needed during the summer to control the grassy weed.

Sports turf managers in Florida face both yellow and purple nutsedge, explains Jim Barnes, pesticide specialist for Broward County School District. Barnes and his pesticide applicator, Lanny Dixon, keep all 22 fields on a tight schedule of both preemergence and postemergence herbicide applications and overseeding to keep weeds under control.

"We frequently work weekends to fit weed control into a heavy sports program at the school district," Barnes adds. "We don't spray whole fields all the time. We concentrate on the compacted areas like bench areas and around tracks where weeds have an advantage over the turf."

Yellow nutsedge and purple nutsedge control have become more effective since the introduction of bentazon (Basagran) and imazaquin (Image), says Barnes. He uses a combination of MSMA and bentazon for the yellow nutsedge, and adds imazaquin for purple nutsedge. The MSMA kills the foliage while the bentazon and imazaquin take care of the nutlets.

Goosegrass in the fields not overseeded with ryegrass is controlled with applications of metribuzin (Sencor). There is a problem controlling goosegrass on overseeded fields because metribuzin can harm the ryegrass and fenoxaprop can harm the bermudagrass. For those fields he must rely on preemergence herbicides and repeated applications of MSMA to control goosegrass. However, in late winter, the metribuzin can come in handy to both control the goosegrass and phase out the ryegrass.

"This far south, bermudagrass doesn't go completely dormant, it just slows down," says Barnes. For this reason, he stays away from using glyphosate (Roundup) to control winter weeds. He is experimenting with a light rate of glyphosate to take out rye between the end of soccer season in February and the beginning of spring football in late April.

He treats overseeded fields in the winter like a northern sports turf manager would, depending mainly on 2,4-D and dicamba for broadleaf weed control and MSMA for

grassy weed control. Prickly sida is a hard-to-control broadleaf weed in compacted practice fields. It takes up to four applications of dicamba to control, says Barnes. Fields which aren't overseeded are aerified, topdressed and treated with preemergence herbicides in the fall.

Summer weed control at Broward County School District consists of spot treatments with postemergence herbicides with MSMA, metribuzin, 2,4-D and dicamba. "Many of our fields are common bermudagrass," Barnes states. "We drill seed in common bermudagrass seed to keep a dense stand of turf and to keep weeds from getting established."

Glyphosate is a major herbicide for control of winter weeds in Texas, says Dr. Bill Knoop, with Texas A&M University's extension center in Dallas. Many schools don't have the budgets to overseed, and even though glyphosate is a relatively expensive herbicide, it is cheaper in both cost and manpower requirements than overseeding.

The state even has a label for glyphosate at very low rates for summer weed control in bermudagrass. The winter rate is one quart per acre in 50 gallons of water, while the summer rate is one pint per acre. "You may hurt the bermudagrass a little or delay spring transition with glyphosate, but at these rates you won't kill it. If you can live through some temporary discoloration, you can control many tough weeds fairly effectively. You can also use glyphosate in cooler temperatures and get better control than with MSMA," Knoop explains.

Crabgrass. Photo courtesy: Max Badgley.

TAG is another nonselective postemergence herbicide schools use to knock out winter grasses such as annual bluegrass and rescuegrass. Ryegrass and six weeks fescue are other grassy weeds in non-overseeded field, says Knoop. "In overseeded turf, you wait until the bermudagrass comes back and then take out the grassy weeds with postemergents." Trimec-type herbicides take care of henbit and other winter broadleaf weeds.

Knoop's list of summer weeds includes goosegrass, dallisgrass, crabgrass, spurge, johnsongrass and knotweed. Grassy perennial weeds in bermudagrass can be controlled during the summer with a light rate of glyphosate, one application of metribuzin, or several applications of MSMA. Trimec-type herbicides are effective on summer broadleaf weeds. Some sports turf managers are mixing glyphosate with Trimec or Weedone DPC to make one herbicide application during the summer, says Knoop.

Both cool- and warm-season turfgrasses are used year-round in California, making weed control a mixture of different methods. Dr. David Cudney, weed specialist for the University of California at Riverside, states that kikuyugrass is the worst weed of all types of turfgrass in the state. The aggressive, low-maintenance grass was imported to Southern California from Africa for erosion control in 1918. It spreads both vegetatively and by seed produced in small seedheads which form below the cutting height of mowers. Kikuyugrass is best adapted to Mediterranean coastal climates. Once established, it forms a thick mat which makes the turf feel spongy but resists other weeds from invading.

Many sports turf managers and golf course superintendents find it easier to let the kikuyu take over since it resists weeds, requires less water and uses less fertilizer,"

continued on page 32

Plaintain. Photo courtesy: Max Badgley.

Postemergence Weed Control

continued from page 31

says Cudney. "But they will have to dethatch it heavily to keep it from getting spongy." The only selective herbicide that will begin to control kikuyugrass is MSMA. Failing that, the only way to get rid of it is with nonselective postemergence herbicides. "You also need a barrier of turf without kikuyugrass around tees, fairways and fields to keep it from moving back in."

Common bermudagrass sports turf can be as much as 90 percent *Poa annua* in the winter, Cudney points out. Ethofumesate (Prograss) could be used to control it, but with poa being such a high percentage of the turf, it's better to manage it until the turf can be renovated, he says.

"Too many sports turf managers wait too late in the fall to overseed with perennial ryegrass," Cudney adds. They try to hold onto the bermudagrass until the last minute. As a result, the less agressive bermuda does not resist invasion by winter broadleaf weeds such as oxalis, clover, dandelion, plantain, dock and southern brass buttons. By overseeding earlier, the ryegrass can become competitive sooner. This is also one reason for some poa infestations, he adds.

Oxalis can be a problem on overseeded turfgrasses in Southern California in the winter. Cudney has had success with applications of triclopyr (Turflon) on oxalis.

Cool-season turf lacks competitiveness during the summer in Cudney's area. Prostrate spurge, oxalis, dallisgrass, goosegrass and other weeds take advantage of the weak turf to get established. Spring seedings of cool-season grasses and late spring seedings with common bermudagrass need to be treated with bromoxynil to keep out summer broadleaf weeds, he says.

Overseeded perennial ryegrasses can hang on into late spring if the weather is mild and hybrid bermudagrasses don't necessarily go completely dormant. Sports turf managers should select ryegrasses with low heat tolerance for overseeding for this reason.

Steve Cockerham, director of the turf trials at the university, has seen some ryegrasses do exceptionally well throughout the year at Riverside. However, summer water requirements for ryegrass as compared to bermudagrass discourage their use. Turf-type tall fescues are growing rapidly for residential and commercial uses in the area and have a lower water requirement than ryegrasses. But their use for sports turf remains limited.

A growing number of superintendents are maintaining creeping bentgrass greens in Southern California, especially resort courses. These superintendents have to watch the bent carefully for both summer weeds and diseases. They rely heavily on preemergence weed control and preventative disease control.

No matter in what part of the country sports turf managers strive to control weeds, the consistent factor in weed prevention is healthy, aggressive turf. Weed control cannot make up for poor maintenance during the year. Proper irrigation, fertilization, and drainage are the first steps in weed control. Periodic renovation may still be required under high use conditions to keep turf dense and weeds under control.

The good news is that the number of weeds in sports turf that have no effective control are decreasing as new herbicides reach the market. More golf course superintendents and sports turf managers are trying these products out with excellent results. Some may cost more than others on a single-application basis, but they can also reduce the total number of applications necessary.

If sports turf is truly important to the user, then funds will be found to accomplish weed control and basic maintenance procedures which assure the quality of the turf. The important thing is to know what can be done when adequate funding is provided.