

Winter Weed Control In Warm-Season Athletic Fields



By Dr. Bert McCarty



aintaining an aesthetically-pleasing and functional athletic field requires a planned yearround program. The challenge is to provide a dense, lush

turf which decreases the chance of injury

TOP: White Clover (*Trifolium repens*). **BOTTOM:** Virginia Pepperweed (*Lepridium virginicum*). Photos courtesy Burt McCarthy.

by providing a cushion for players. In addition to providing a cushion, thick, healthy turf also minimizes weed invasion. This article will review turf management practices and herbicide options available to athletic field superintendents who have to ensure a quality turf surface void of weeds.

Provide Healthy Turf

Athletic fields, unlike most commercial turf areas, are exposed to intense traffic pressure. Today's linemen can weigh more than 300 pounds. When this amount of force is placed on an area the size of a shoe, turf damage is bound to happen.

The first key to providing healthy

turf is to construct fields with an appropriate soil mixture, proper drainage, and adequate irrigation.

Using fundamentally sound agronomic practices is the second key for quality long-term athletic field surfaces. Bermudagrass is the turf species most often used for southern athletic fields. Zoysiagrass, and Florida bahiagrass are also used in athletic fields, but not to the degree of bermudagrass. Bermudagrass provides a dense, resistant, appealing turf surface when properly managed. However, thin, worn areas develop when the grass is mismanaged or when there is excessive concentrated traffic. These worn areas soon become weed patches and require an extensive amount of time to recover.

In order to maintain bermudagrass fields at the high activity level, the fields must be frequently mowed at the proper height (e.g., minimum of twice weekly at 3/4- to 1-1/4-inch). They must be watered deeply but infrequently to encourage rooting and regrowth. They also must be frequently fertilized to provide a dense cover. Aerification twice a year is needed to combat soil compaction. Local cooperative extension service offices can provide specific recommendations for athletic fields in select areas.

Weekly game traffic, along with team and band practices, should be limited. Concentrated stepping in the areas used by these groups causes extensive damage to the turf. Location of practice within a given athletic field should be rotated as much as possible to avoid excessive damage. Foot traffic also should be minimized when the field is excessively wet.

Identifying Weeds

Weed identification is the next step in its control. If the weed is unknown, it should be taken to the local extension service for identification. A recent publication, *Weeds of Southern Turfgrasses*, can also be quite helpful. Jointly released by turf and weed specialists at the University of Florida, the University of Georgia, and Auburn University, this 208-page book contains 437 color photographs of 193 weed species found in southern turfgrasses and nurseries.

Herbicides

Once the turf has been maintained with proper cultural practices and the weeds present have been identified, the next step is to create a control program. Knowledge about a given weed's most susceptible growth stage and chemical tolerance or susceptibility of the turf it has invaded are important. The economics of using a given chemical and the development of a treatment program also are aspects to consider. In addition to correctly choosing and using a specific herbicide, proper application techniques are needed.

Many variables influence successful herbicide application. They include proper equipment, environmental factors in action at the time of application, proper calibration of equipment, and adequate agitation of the chemical solution. Most herbicide failures involve using the wrong chemical at the wrong time, in an improper manner or rate.

Preemergence Herbicides

Preemergence herbicides are applied to the turfgrass site prior to weed seed germination because this group of herbicides controls weeds during seed germination. The mode of action for most preemergence herbicides (e.g., Betasan, Balan, Surflan, Dimension, pendimethalin) is the inhibition of certain phases of cell division (mitosis). As the weed seedling germinates, its root and shoots contacts the herbicide layer, which prevents cell division, resulting in the death of the seedling. These herbicides are most active on annual bluegrass and unwanted perennial ryegrass clumps during the winter.

Several problems with preemergence herbicides exist when they are used on athletic fields. Since these materials are inhibitors of plant cell division, they can prevent bermudagrass regrowth in worn areas. As bermudagrass grows across treated areas, rooting through the herbicide layer is prevented.

Another potential problem with weed control in athletic fields is that many fields are overseeded with ryegrass in the fall to maintain turf color after frost occurs. Used incorrectly, most preemergence herbicides will prevent ryegrass seed from germinating. Turf managers should therefore follow all label directions when overseeding is planned.

If clumps of perennial ryegrass are undesirable in areas adjacent to overseeded areas, a preemergence herbicide should be applied before overseeding. Surflan, Dimension, pendimethalin, or Barricade can be used to outline, or picture-frame, an overseeded area by preventing movement of ryegrass from the desired overseeded area to adjacent areas.

Grass weeds. The major winter grass weeds in warm season athletic fields are annual bluegrass (Poa annua) and clumps of escaped ryegrass. Annual bluegrass germinates in late summer or early fall when soil temperatures at the four-inch level reach the low 70s. A second germination flush typically occurs in mid-winter. Problems when controlling annual bluegrass include preemergence herbicide-delayed recovery of damaged turf areas, or the herbicide interfering with ryegrass germination on overseeded fields. Several preemergence materials are now available that do not have these problems when proper application timing is followed. Pronamide (Kerb) provides good to excellent control of annual bluegrass with minimum damage to germinating ryegrass. Minimal damage to the rooting of the permanent bermudagrass also is achieved with Kerb. It must, however, be applied 60 to 90 days before overseeding. Application of Kerb should occur in midsummer in most areas. If applied closer to the overseeding date, the Kerb application may delay or prevent desirable ryegrass establishment.

Activated charcoal has been used successfully to prevent injury to the desirable overseeded grass when Kerb was applied closer than 90 days to overseeding. High rates (e.g. 2-1/2 to four pounds per 1,000 square feet) of charcoal are necessary. A disadvantage of this method is the inability to re-establish the ryegrass in the event the charcoal treatment fails. Current formulations of activated charcoal also are messy to handle and apply and may reduce the effectiveness of the herbicide.

If the field is not to be overseeded, Kerb can be applied before, during, or shortly after annual bluegrass germination since it offers both pre- and post-emergence control of this weed. A second application probably will be needed in midwinter (late January through early February) to control additional germination.

Rubigan, a fungicide with selective herbicide activity, also provides preemergence annual bluegrass control without adverse effects to overseeded grasses or bermudagrass. Optimum weed control occurs when a series of two or three applications are made. The last application should be

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timed for two weeks prior to overseeding. Multiple applications provide best control but require appropriate timing.

Broadleaf weeds. Preemergence broadleaf weed control traditionally has not been used for overseeded athletic fields. The herbicide Gallery, has become available for this purpose. Gallery, at the low rate, must be applied at least 60 days prior to overseeding to prevent damage to the ryegrass. Higher rates require longer waiting periods. Although Gallery controls annual broadleaf weeds, it does not satisfactorily control annual bluegrass. It must be tank-mixed with one of the other herbicides for control of that weed.

Watering-in. Irrigation is an important management practice when preemergence herbicides are used. Preemergence herbicides require incorporation and activation by irrigation to be effective. One-quarter to 1/2-inch of water is required within seven to 10 days of application to optimize their activity. If irrigation is not done within this time frame, many herbicides will not be in position to control the germinating weed or may lose their effectiveness by being broken down by sunlight. They also may be volatilized.

Repeat applications. Repeat applications of preemergence herbicides generally are necessary for season-long control of weeds. Most herbicides, when exposed to the environment, begin to degrade soon after application—the level of degradation usually occurring six to 16 weeks post-application. The reduced herbicide level in the soil results in poor control of later germinating weed seeds. Repeat herbicide applications become necessary at this time for prolonged preemergence weed control.

Postemergence Herbicides

Postemergence herbicides generally are effective only on visible weeds. The timing of the application should be when weeds are young (two to four leaf stage) and actively growing. At this stage, herbicide uptake and translocation is favored, and turfgrasses are better able to fill in voids left by the dying weeds.

Weeds actively grow primarily when temperatures are between 40 and 80 degrees F. This is the time when postemergence herbicides are used. Applications outside this range either respond too slowly or result in excessive turf damage. The soil must be moist to prevent or minimize turf damage.

Broadleaf Weed Control. Broadleaf weeds such as chickweed, henbit, clover, and dandelion normally are controlled with 2,4-D or combinations of 2,4-D plus 2,4-DP, MCPP, MCPA, and dicamba. All are selective, systemic, and foliarapplied herbicides. Few broadleaf weeds. especially perennial ones, are controlled with just one of these materials. Usually two or three-way combinations of these and possible repeat applications of them are necessary for satisfactory control of older plants. Basagran T/O also controls many winter annual broadleaf weeds. Basagran T/O, however, is not as effective on biennial or perennial weeds. Sequential applications of all broadleaf weeds herbicides should be spaced 10 to 14 days apart, and should be considered only after the ryegrass has been mowed three or four times.

These various herbicide combinations were the main chemicals for broadleaf control until recently. New chemistry, such as Turflon and Confront, provides alternatives to these tradi-



tional materials. Although this new herbicide chemistry provides a wider array of materials to choose from, economics must still be considered before using them.

Postemergence Grass Weed Control. The predominant winter annual grass weeds are annual bluegrass and clumps of ryegrass that have escaped from the intended overseeding site. These effectively can be controlled with postemergence herbicides, assuming the turf is not overseeded with ryegrass or other cool-season grasses. In nonoverseeded turf, atrazine (AAtrex), simazine (Princep T&O), or pronamide (Kerb) will provide excellent control of young annual bluegrass and ryegrass. The key to the success of these materials is the application timing. The first application should be applied before cold temperatures occur in mid to late fall when weeds are small and easiest to control. A second application in late January or early February will be necessary to control the subsequent flush of germination that occurs at that time. Atrazine and simazine have the added benefit of also controlling many winter annual broadleaf weeds such as lawn burweed, chickweed, and henbit. If control is attempted later in March or April, the effectiveness of the herbicide is reduced. The time required for weed control also is longer and bermudagrass spring green-up may be delayed with later applications. Atrazine and simazine should not be applied in spring during bermudagrass green-up.

If turf managers wish to eliminate the overseeded ryegrass once seasonal play has ended, mid-winter herbicide applications should be planned. Ryegrass control without injury to bermudagrass is achieved with Kerb, simazine, and atrazine. The herbicide should be applied in mid-winter when the bermudagrass is dormant and has not begun to greenup. Response from these materials will be slow when temperatures are cool.

Postemergence annual bluegrass control is limited in overseeded situations. Ethofumesate (Prograss) is the material available for this purpose. However, to prevent turfgrass injury, the application rate, time, and frequency are important. Prograss should be used 30 to 45 days after overseeding when the bermudagrass is completely dormant. If applied sooner, delayed bermudagrass greenup may result the following spring. A subsequent application 30 days after the initial application can be used but should not be made after January. Applications after January also can result in delayed spring green-up. Prograss is not recommended in areas such as Florida because the bermudagrass normally does not go completely dormant. \Box

Editor's Note: Bert McCarty is an associate professor of turfgrass science at the University of Florida, Gainesville. Copies of Weeds of Southern Turgrasses may be ordered for \$8 each through:

University of Florida Publications, P.O. Box 110011, Gainesville, FL 32611-0011 (checks should payable to University of Florida, Florida residents must add 6 percent sales tax).

Publications Distribution, Alabama Cooperative Extension Service, Duncan Hall, Auburn University, Auburn, AL 36849-5623 (checks should be payable to Alabama Cooperative Extension Service).

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