



Managing summer annual weeds on high traffic sports fields

THERE IS AN OLD ADAGE that the best form of weed control is a healthy, dense stand of turfgrass. Is it any wonder that high traffic sports fields virtually absent of turf cover are often riddled with summer annual weeds? Solving these weed problems requires more than a phone call to schedule a contractor-performed herbicide application. A long-term seeding program that may involve strategically-timed herbicide applications, or perhaps even sodding, must be employed to fill-in the voids in turf cover caused by traffic.

THE PROBLEM

Sports field locations that are heavily trafficked during fall and receive little to no overseeding during that period typically enter winter as bare soil. These voids in the turf cover are ideal conditions for summer annual weeds to germinate during the following spring months, mature in summer, and produce large quantities of seed in late summer. The weed seed is returned to the soil creating a seed bank that will replenish weed populations for years to come. As temperatures cool and mother nature brings the first frost during fall, summer annual weeds are reduced to fragile skeletons and continued field use quickly reverts the surface back to bare soil—an unsafe surface that can lack stability when wet (i.e. mud) and be hard-as-concrete when dry.

Crabgrass (*Digitaria* spp.), goosegrass, (*Eleusine indica* L.) and prostrate knotweed (*Polygonum aviculare*) are summer annual weeds that are routinely present on high traffic sports fields.

Crabgrass is among the most common summer annual grassy weeds that invade turf areas. It germinates when soil

temperatures have been 55 degrees F for 4 to 5 consecutive days, typically corresponding with early April to early May in the Northeast United States.

Goosegrass, sometimes referred to as silver crabgrass, is a grassy weed, has a recognizable zipper-like seedhead structure and germinates later in spring compared to crabgrass when soil temperatures in the upper ½-inch of soil are 60-65

>> HIGHLY TRAFFICKED sports fields that receive little or no overseeding during fall and subsequent spring months may consist almost entirely of summer annual weeds such as prostrate knotweed in field centers during summer months. Photo by Brad Park.

degrees F for 12 to 15 consecutive days. Often observed in goal creases, field centers, and footpaths where pedestrians cut-across turfgrass sites, goosegrass tends to be more tolerant of compacted soil conditions compared to other grasses and broadleaf vegetation.

The earliest germinating summer annual weed that affects sports fields in the Northeast is prostrate knotweed, a weed in which seedlings have been observed in northern New Jersey in the first week of March. Prostrate knotweed seedlings are often misidentified as newly germinated turfgrass; however, prostrate knotweed is a broadleaf weed (i.e. dicot) and has two seed-leaves (i.e. cotyledons). In contrast, grass species (i.e. perennial ryegrass, crabgrass, etc.) are monocots and have a single initial seed-leaf. Similar to goosegrass, prostrate knotweed is a common problem on heavily trafficked sports fields constructed out of compaction-prone native soils.

While summer annual weed lifecycles and the season-specific timing of much sports field use presents an inherent challenge, an added dilemma is that some sports fields are routinely treated with conventional preemergence herbicides (i.e. pendimethalin, prodiamine, or dithiopyr) in March and April yet are predominantly bare soil in field centers and goal

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creases. This decision does not improve turf cover in these high traffic areas. The following sections will examine the choice of seeding bare soil locations in early spring, as soon as soil conditions allow, and applying postemergence herbicides for selective control of summer annual weeds.



>> **SUMMER ANNUAL WEEDS** die during fall and their location in the field is reduced to bare soil entering winter if no action is taken. Photo by Brad Park.



>> **Above: PROSTRATE KNOTWEED** is a broadleaf weed and the earliest germinating summer annual. New seedlings have been observed in early March in northern New Jersey and are often misidentified as seedling turfgrass or crabgrass. Photo by Brad Park.



>> **GROWTH BLANKETS** can be used to cover late fall- or spring-seeded locations of sports fields to accelerate the germination and establishment of desirable turfgrass when soil and air temperatures would otherwise significantly delay the formation of turf cover. Photo by Brad Park.

SEEDING SOLUTIONS

Seed selection. In many school and municipal settings, the decision to seed high traffic fields as opposed to applying pre-emergence herbicide in the spring will require the Supervisor of School Buildings and Grounds, Department of Public Works Chief, or other manager with multidisciplinary facilities responsibilities to keep records of fields with histories of summer annual weed problems. Record keeping is an integral component of Integrated Pest Management (IPM), a strategy that seeks to reduce pesticide use through, in part, site

assessment and monitoring. These records can be used to direct pesticide application contractors to withhold applications of pre-emergence products from bare soil sports fields that should receive priority for spring seeding, thus reducing unnecessary pesticide inputs.

Blends of perennial ryegrass are the best cool-season turfgrass choice for this purpose, given the ability of this species to germinate and establish more readily in cooler soil temperatures prevalent in late fall and early spring compared to other cool-season species. While seed mixtures may be marketed for “high traffic” locations or “sports turf,” these products typically contain Kentucky bluegrass and/or tall fescue, two species better suited for late summer/early fall seeding timings and an allowance for ample grow-in.

Gray leaf spot resistant perennial ryegrass blends are a highly useful tool for sports field managers and should be seeded on fields in climatic/geographic regions that had a history of gray leaf spot problems. Gray leaf spot is particularly problematic in late summer and early fall, a time coinciding with the beginning of the fall sports season and a need for routine overseeding. The establishment of site-appropriate turfgrass species and disease resistant varieties will reduce the need for future pesticide inputs and is a building block of IPM in turfgrass.

Seeding methods. Controlling summer annual weeds with postemergence herbicides requires newly seeded perennial ryegrass to be mature enough to withstand such application. This maturity is typically described in pesticide labeling terms as two or three mowings or 28 days after emergence (Note: NOT 28 days after seeding). Efforts should be made to accelerate perennial ryegrass establishment in early spring, before the germination of summer annuals, so that perennial ryegrass is not adversely affected by an herbicide and summer annual weeds are still in an early growth stage, a period when they are most

susceptible to postemergence control.

Better perennial ryegrass establishment can be achieved by seeding at 8 to 10 lbs seed/1000 ft² and improving seed-to-soil contact through slit-seeding or using tractor-mounted machines that incorporate solid tine cultivation and seeding in one pass. Applying a starter fertilizer at the time of seeding and additional fertilizer 2 to 3 weeks following seedling emergence will hasten establishment. Using growth blankets immediately following seeding and starter fertilizer application is a highly effective method to improve turf establishment during periods when soil and air temperatures are not conducive for germination and establishment. This includes seeding projects that occur at the conclusion of the fall sports season. Routine monitoring of perennial ryegrass development under the blanket must occur so that mowing can commence as soon as possible.

Ultimately, an aggressive perennial ryegrass overseeding program must be employed during periods when fields are in use. Before games and practices, perennial ryegrass can be introduced to high traffic filed locations using a rotary spreader and allowing athletes to “cleat-in” the seed to achieve necessary seed-to-soil contact. Caution should be exercised if slit-seeders with vertically spinning blades or solid tine cultivation/seeding devices are used in the midst of in-season overseeding as these machines can potentially injure new seedlings resulting in previous overseeding efforts.

The goal of these seeding strategies is to maximize turf cover at all times. This is particularly important heading into winter when seed germination and turf growth is virtually nonexistent and a bumper crop of summer annuals is laying in the soil awaiting germination in the spring.

HERBICIDE STRATEGIES

Herbicides such as mesotrione (e.g. Tenacity) and siduron (e.g. Tupersan) may be applied at the time of spring seeding to provide some preemergence control of crabgrass and not adversely affect the establishment of perennial ryegrass. Preemergence control of goosegrass and prostrate knotweed is not listed on the pesticide labels for either of these active ingredients. Additionally, mesotrione should not be ap-

plied at rates higher than 5.0 oz product/Acre to newly seeded perennial ryegrass. An early-to-mid March perennial ryegrass seeding timing may be more than a month prior to crabgrass germination; thus, an application of siduron or mesotrione in concert with seeding at this time is likely too early relative to crabgrass germination. Crabgrass emergence during late spring and early summer may follow. Addressing crabgrass and other summer weeds on a post-emergence basis is likely a better decision.

Newly germinated crabgrass or those plants up to one tiller are susceptible to postemergence applications of quinclorac (e.g. Drive XLR8). Per quinclorac labeling, goosegrass is not on the list of susceptible weeds. Perennial ryegrass may be seeded up

until the date of a quinclorac application; however, the application should be withheld for 28 days after emergence of perennial ryegrass. Quinclorac is a very unique herbicide active ingredient as it has postemergence activity on both grassy and broadleaf weeds common on sports fields including white clover, black medic and dandelion.

Fenoxaprop (e.g. Acclaim Extra) is labeled for control of young (1-leaf) to mature (5-tiller) crabgrass and goosegrass and can be applied to perennial ryegrass that is at least 28 days old. Not surprisingly, younger crabgrass and goosegrass plants are susceptible to relatively low fenoxaprop application rates, whereas four to five tiller grassy weeds require higher rates for effective control. Underscoring the need to thoroughly read and understand pesticide labels, as well as having the ability to identify both desirable turf species and targeted grassy weeds, Kentucky bluegrass is susceptible to injury when high rates of fenoxaprop are applied for control of grassy weeds that have eclipsed four tillers in growth.

Mesotrione is also labeled for postemergence control of crabgrass and goosegrass plants that are less than four tillers. Per pesticide label information, repeat applications with a nonionic surfactant are necessary and product rates should not exceed 5.0 oz/Acre on stands of perennial ryegrass. Newly seeded turf should be mowed two times or have emerged at least 28 days before (whichever is longer) before application of mesotrione.

Prostrate knotweed is most effectively controlled when the plant is young and has yet to form the thick spreading mat of vegetation associated with its name. Because it is a broadleaf weed, postemergence herbicides labeled for grassy weeds will not be effective for control.

Dicamba (e.g. Banvel) is the most effective broadleaf active ingredient for control of prostrate knotweed. To avoid herbi-

cide injury to new perennial ryegrass, the seedlings should be mowed a minimum of two times prior to dicamba application.

SOD SOLUTIONS

While more expensive compared to seed, sod installation is a strategy that not only creates instant turf cover but also can also have the effect of suppressing weed emergence.

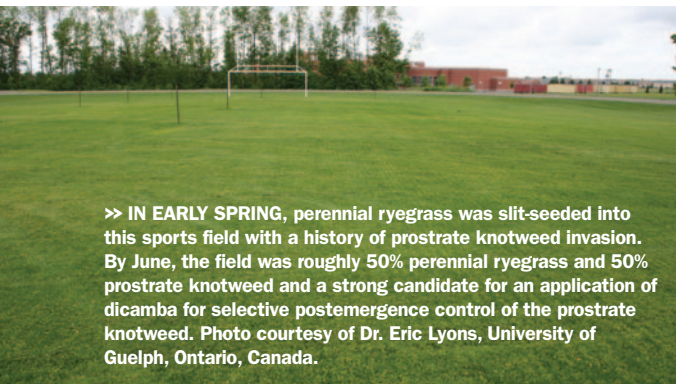
Modern turf milling equipment (e.g. Koro Field Topmaker, BLEC Combinator, etc.) can be used to remove the existing turf, thatch and 0.25 to 1.5-inch of soil before sodding. Fields with long-time summer annual weed problems would greatly benefit from this site-preparation strategy as a portion of the soil weed seed bank can be removed as part of this process.

Installation of high quality sod (free of annual bluegrass) that consists of improved varieties of Kentucky bluegrass or a mixture of tall fescue and Kentucky bluegrass will serve as new carpeting over bare, weed seed infested soil. Sodding is best performed at the end of the fall sports season; however, if spring sodding is to occur, sod should be installed as soon as it is available from growers and when soil conditions are dry enough to allow installation procedures without adversely compacting the soil. Ample time must be allowed for sod to establish before resumption of field use. Be sure to specify non-netted sod for sports fields.

Sports field managers are under increased pressure to reduce synthetic pesticide inputs. The problem of severe summer annual weed encroachment on sports fields cannot typically be addressed by herbicide applications alone. Establishment of turf cover using seeding or sodding methods must be integrated into the solution.

Additionally, recognize that a pesticide label is a legal document that contains information on product use, tank-mix compatibility, and turfgrass tolerance. The label must be thoroughly read and understood before applying a pesticide product. ■

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>> IN EARLY SPRING, perennial ryegrass was slit-seeded into this sports field with a history of prostrate knotweed invasion. By June, the field was roughly 50% perennial ryegrass and 50% prostrate knotweed and a strong candidate for an application of dicamba for selective postemergence control of the prostrate knotweed. Photo courtesy of Dr. Eric Lyons, University of Guelph, Ontario, Canada.



>> IN ADVANCE of sod installation, milling equipment can be used to remove unwanted turf and weed cover as well as a portion of the weed seed bank in the soil. Photo by Brad Park.



>> Above: INSTALLING SOD can be a highly effective strategy to reduce summer annual weed populations. In this photo, goosegrass skeletons surround a weed-free sodded location in late November following the fall sports season. Photo by Brad Park.