



Competitive turf: overseeding for weed management

WEED MANAGEMENT ON ATHLETIC FIELDS and in municipal parks is becoming increasingly important as traditional weed control measures, such as herbicides, become unavailable due to municipal legislation and changing public perception. Currently, many municipalities and two provinces in Canada have banned or restricted the use of herbicides affecting more than 20 million Canadians. Turfgrass managers must turn to cultural practices and optimize their efficacy to develop an effective integrated pest management (IPM) program that decreases or eliminates the need for herbicides. IPM programs with a focus on weed management are important in delivering a good quality and safe playing surface for user groups.

Overseeding is typically used to fill in bare areas and stabilize soil to create a uniform playing surface for athletes. Current overseeding practices typically use perennial ryegrass and Kentucky bluegrass to create a vigorous, wear tolerant playing surface. However, due to time restrictions and increased use of facilities, the potential to manipulate overseeding for weed suppression is not being realized.

Research aimed at optimizing overseeding as a weed management tool is currently under investigation at the Guelph Turfgrass Institute (GTI), University of Guelph. The initial field trials examined the effectiveness of perennial ryegrass overseeding into pre-existing Kentucky bluegrass under low and high-use conditions and in non-irrigated and irrigated situations. Perennial ryegrass is quick to germinate and establish which is important when competing with weed species for light, water, nutrients and space. All plants compete for these four main elements and overseeding encourages a desirable turfgrass species to compete and establish as opposed to undesirable weed species.

Perennial ryegrass was overseeded in non-irrigated and irrigated trials at the GTI field station in Guelph, and on in-use soccer fields at the University of Guelph campus and in the Town of Oakville, Ontario, Canada over 2 years. Weed populations were not affected by overseeding in 2005, a dry growing season. However, when weed populations were high and normal growing conditions existed in 2006, overseeding applications in May/July/September at 8.2 lbs/1000ft² and 16.4 lbs/1000ft² decreased perennial weed cover, specifically white clover in the irrigated trial and dandelion in the non-irrigated trial at the GTI. An increase in perennial ryegrass was

observed in all plots that received an overseeding treatment. Treatments applied on the in-use soccer fields, which included May/September and May only overseedings, had no effect on weed populations or perennial ryegrass populations compared to the weedy control.

Too much of a good thing?

One potential concern with high rates of overseeding of perennial ryegrass into Kentucky bluegrass fields is that eventually the fields may be converted to perennial ryegrass. While perennial ryegrass has a quick germination time and appears to have increased seedling wear tolerance making it an ideal grass for overseeding and competing with weeds, it lacks the rhizomes that are prevalent in Kentucky bluegrass cultivars. The rhizomes are often related to quick recovery and fill in after excessive wear. In addition, rhizomes also provide increased stability because they are much thicker than the roots of turfgrass and offer more resistance to the tearing caused by cleats.

One of the largest concerns with increased populations of perennial ryegrass on athletic fields is the lower winter hardiness of perennial ryegrass in Canada and northern United States when compared to Kentucky bluegrass. While perennial ryegrass survives most winters, depending on climatic conditions and location we have observed 70-80% mortality in some winters. Kentucky bluegrass can also suffer winter injury although it is much less common most likely because of a prolonged spring dormancy and regeneration from rhizomes which are protected below the soil surface.

We are uncertain that overseeding with Kentucky bluegrass is effective. Kentucky bluegrass is much slower to germinate, and has reduced wear tolerance until rhizome formation is initiated. Work at Iowa State University by Dr. David Minner has shown that under simulated traffic Kentucky bluegrass overseeding did not appear to be effective and did not increase turfgrass cover. Generally it is believed that for Kentucky bluegrass overseeding to be effective field closure is necessary, rarely an option in a municipal athletic field situation.

Despite this information and the increased cost of overseeding with Kentucky bluegrass compared to perennial ryegrass, many athletic field managers in areas highly susceptible to winterkill include some amount of Kentucky bluegrass in their overseeding program.

Our current research, being implemented on research plots and in-use municipal athletic fields, is examining both the weed suppression capability and the amount of perennial ryegrass and Kentucky bluegrass in overseeding programs that range from 100% Kentucky bluegrass to 100% perennial ryegrass. We are also comparing whether overseeding 5 times a year is better than overseeding 3 times a year. By the end of the current research we hope to be able to make better recommendations regarding the use of Kentucky bluegrass in an overseeding program.

Many turfgrass managers try to target their overseeding program to the time of year that they believe to be best for seed germination and survival. Often this means trying to overseed once a year in the late summer/early fall. Our research suggests that it is more important to overseed as frequently as possible throughout the growing season for the inhibition of weed invasion. Weeds invade when a bare spot appears and frequent overseeding allows the desirable turfgrass species to have a chance to fill that void before a less desirable weed species. In addition, weather patterns are very unpredictable and a mid-July overseeding can be the most important if followed by a cool spell with good rainfall while the fall can be ineffective if the weather is unusually warm and dry. Our research suggests that frequent overseeding is effective for two reasons, it provides seed ready to fill voids as they appear and it increases the chances of experiencing favourable weather conditions during germination and establishment.

Money is an issue

One drawback of an overseeding program is that it is very expensive, and while it may help limit the presence of weeds on athletic fields it is nowhere near as effective as traditional weed control practices. Multiple researchers have shown overseeding with perennial ryegrass usually increases quality and playability of fields under high use and this alone justifies its practice. Often it is hard to justify the budget for overseeding and adding weed control as an additional benefit of overseeding may justify including an overseeding program as part of your usual management practices. Our research has shown that over the short-term, high rate and frequent overseeding with perennial ryegrass appears to provide competition against perennial weeds when weed pressure is high. Overseeding is an essential part of reducing herbicide application as part of an IPM program or maintaining athletic fields under a pesticide free management plan.

Thanks to funding by industry groups such as the Sports Turf Association and the Ontario Turfgrass Research Foundation, government agencies, partnerships with municipalities, and Pickseed Canada Inc., a total of seven field trials have been completed and more are underway. ■

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