TOWN OF OAKVILLE

THERE'S A NEW GAME IN TOWN. KNOW THE LIMIT & WORK WITHIN IT!

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The title says it all. There are new limitations on how you manage your sports fields. Part of the struggle at the moment is knowing what can and can't be done. The second part of the struggle is to figure out ways to work within the new Pesticides Act and regulations and still maintain safe, healthy sports fields. This article is going to focus on what we can do to maintain healthy turf and also to make you aware of some of the research that began this summer that will address some of the knowledge gaps that we have when operating in an environment without pesticides. The focus of this article is on minimizing weeds in sports fields.

Turf Management Basics

We are now forced to focus on the basics of turf management to have sports fields with minimum weed cover. The tools that we have at our fingertips are not new. They are:

- turfgrass species selection
- turfgrass cultivar selection
- mowing
- fertilizing
- irrigating
- aerating
- overseeding

Turfgrass Species Selection

Most recommendations for sports fields in Ontario suggest 100% Kentucky bluegrass (sodded fields) or 80:20 mixtures of Kentucky bluegrass and perennial ryegrass. With sodded fields there is the opportunity to incorporate the more traffic tolerant perennial ryegrass species through an overseeding program. Without herbicides in our toolbox, do we need to investigate other turfgrass species to help us achieve sports fields with minimum invasion from weeds? Is it time to look at species like *Poa supina* or tall fescue for sports fields in Ontario?

Turfgrass Cultivar Selection

In this current climate of managing sports turf with a pesticide ban, knowledge is power. It isn't only important to select the correct species composition for your sports field, it is also important to select the best cultivars. A lot of work has been done by researchers at Rutgers University to characterize Kentucky bluegrass cultivars and there is a summary of the information in the *Sports Turf Manager* Vol. 22, No. 1 "Understanding Turfgrass Species for Use on Athletic Fields & Recreational Areas" by Paul Stevens. This information is very useful. The groups are divided according to growth type (compact, aggressive), colour, density and stress tolerance. There is not reliable information on traffic tolerance or resistance to broadleaf weed invasion. Currently all of the National Turfgrass Evaluation (NTEP)

tests apply a broadleaf herbicide to establish weed free plots.

The Guelph Turfgrass Institute has a Kentucky bluegrass trial underway at the moment. It could be very valuable to look at how these cultivars resist broadleaf weed invasion and how they stand up to wear. Dr. Jordan and Dr. Lyons have a dwarf Kentucky bluegrass trial at the Guelph Turfgrass Institute that was established in 2008 that is looking at the effects of various mowing heights, wear, divot recovery and weed invasion. This information could prove to be very useful for turfgrass managers to help them select Kentucky bluegrass cultivars that will stand up to wear and will also resist weed invasion.

To my knowledge, this type of information is not available for perennial ryegrass cultivars. Similar to the Kentucky bluegrass trials, the NTEP ratings for perennial ryegrass look at quality, spring green up and resistance to some common diseases. In addition, it is more important than ever to consider using endophyte enhanced perennial ryegrass seed in your overseeding program to reduce the likelihood of losing your sports field to a turf insect pest. The good news is that NTEP has announced that for cool season turfgrass trials seeded in the fall of 2009, they will be testing for drought and traffic tolerance. For more information, visit their website at www.ntep.org.

Mowing

Mowing does have an impact on weed invasion in turf. This is particularly true for crabgrass invasion. Studies on tall fescue (Dernoeden et al., 1993) showed mowing at 3.5" (9 cm) gave 100% control of crabgrass plants. At 2.5" (6 cm) there was a 40% reduction of infestation of crabgrass. Studies have shown that at excessively low mowing heights there is an increase in invasion of dandelion and clover. A demonstration trial that was conducted over a five year period at the Guelph Turfgrass Institute showed an interaction between mowing height (4 and 8 cm) and year on broadleaf weed invasion, suggesting that there was an interaction between the amount of rainfall and timing of the rainfall on weed invasion at the different mowing heights. The suggestion is to mow as high as possible for the intended use of sports fields.

Fertilizing

Supplying turf with adequate nitrogen fertilizer has a big impact on weed invasion. Fertilizer applied in the spring to thin turf provided a 70% reduction in crabgrass control. In the demonstration trial mentioned earlier in this article, percent broadleaf weed coverage in the fertilized plots was reduced from 50% to between 5-10% over the five year study just by applying 2.0 kg of nitrogen (N) per 100 m^2 per year. Supplying sports fields with a balanced fertility program based on a

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soil test for phosphorus and potassium and roughly 2.0 kg of nitrogen (N) per 100 m^2 per year will go a long way in helping to prevent weed invasion.

Irrigating

Regular irrigation of a sports field to keep the turf growing vigorously throughout the growing season helps the turf outcompete weeds. If a field is allowed to go dormant during a dry summer, it is more susceptible to broadleaf weed invasion.

Aerating

We know that aerating has a positive effect on turfgrass by reducing thatch, soil compaction and improving rooting. Compaction has an effect on weed invasion. Many weed species out-compete turfgrass in compacted sites. Many highly compacted areas of a sports field will only support the growth of prostrate knotweed and annual bluegrass. On moderately compacted sites, plantain is more competitive than turfgrass.

Sports fields need regular irrigation to keep turf growing vigorously. This helps turf out-compete weeds. If a field is allowed to go dormant during a dry summer, it is more susceptible to broadleaf weed invasion.

Elford et. al. 2008, showed in the non-irrigated, non-overseeded plots, dandelion populations were much higher than in the non-irrigated overseeded plots. Interestingly, clover was more of a problem in the irrigated fields. Excessive irrigation can increase the likelihood of invasion of annual grassy weeds such as annual bluegrass. Information on irrigation using a water budget method to determine irrigation timing and quantity can be found in *Sports Turf Manager* Vol. 19, No. 2 "Water in the Bank" and *Sports Turf Manager* Vol. 20 No. 2 "Use it or lose it" by Dr. Terry Gillespie and Pam Charbonneau, respectively.

A minimum of aeration twice a year is recommended in the spring and fall. On heavily used sports fields, this could be done monthly to keep turf healthy and help it out-compete weeds.

Overseeding

Research into overseeding with perennial ryegrass as a means of suppressing or preventing broadleaf weed invasion has been investigated in Scandinavia, the United States and in Ontario. In athletic fields in Denmark, vertical mowing plus overseeding and topdressing resulted in a significant decrease in weed populations (Larsen et al., 2004). In the *Sports Turf Manager* Vol. 17, No. 1, Chinery et al. summarized some work that he had conducted in "Heavy Repetitive Overseeding" and noted an increased turf density with heavy repetitive overseeding of perennial ryegrass; however the quantification of weed populations were not included in these studies.

Elford et al. (2008) found that overseeding three times a season in May, July and September at 4 and 8 kg/100 m^2 significantly decreased perennial weed cover (specifically white clover) in the irrigated trial and dandelion in the non-irrigated trial at the Guelph Turfgrass Institute. He also noted an increase in perennial ryegrass in all plots which received an overseeding treatment.

Currently Available Weed Control Options

Under the Pesticides Act and Regulation 63/09, in Ontario the products that can be used on weeds in sports fields are corn gluten meal, acetic acid and *Sclerotinia minor.* Corn gluten meal is labelled for the inhibition of crabgrass, dandelion and white clover. Our experience with it shows that it may need to be used for several seasons to be effective. It does not, however fit in well with an overseeding program because it will inhibit germinating ryegrass seedlings.

Acetic acid can be used to spot treat weeds. It needs to be applied to young growing weeds and may require repeat applications. *Sclerotinia minor* is effective under a very narrow set of environmental conditions (18-24º C and high relative humidity). It must be irrigated within 12 hours and the turf or weed canopy needs to be kept moist for several days for it to be effective. There are also non-selective weeding tools available from various suppliers that rely on super-heated water or propane flames that can kill weeds.

Future Research

Last summer at the Guelph Turfgrass Institute, an overseeding and irrigation study was conducted on in-use soccer fields. This study combined core aeration and overseeding with a drop spreader at 0, 3 and 6 kg of perennial ryegrass per 100 m^2 in May, July and September. This study will continue in 2009 with the addition of slit-

seeding of perennial ryegrass at the three rates (see the "Irrigation and Overseeding of Pesticide-Free Soccer Fields" article in this edition of *Sports Turf Manager*).

In addition to the above mentioned trial, the Ministry of the Environment is funding a three year study conducted by Tardif, Jordan and Lyons, University of Guelph. The overall goal of this project is to provide the turfgrass industry with the knowledge to provide safe athletic fields and home lawns without the use of traditional herbicides:

Objective 1: Determine the optimal mixtures (Kentucky bluegrass and perennial ryegrass proportions), timing and method of overseeding allowing best weed suppression and highest turfgrass cover.

Objective 2: Determine the efficacy of seeding versus sodding, with or without traditional or alternative (exempted) herbicide applications, for the establishment of new turf.

Objective 3: Determine best combination of site preparation and seeding methods to reduce weed encroachment during turfgrass rehabilitation.

Objective 4: Determine the efficacy of sodding Kentucky bluegrass or fine fescues compared to overseeding fine fescues or fine fescues into Kentucky bluegrass for the establishment of low maintenance turf.

The Ministry of the Environment has also partnered with the Agricultural Adaptation Council (AAC) to fund research and innovation on alternatives to the use of pesticides for cosmetic purposes. The program is called CUPRI – Cosmetic Use Pesticides Research and Innovation Program. They are calling for proposals from for-profit, academic institutions, university researchers and not-for-profit sectors. A call for proposals was issued in May 2009 and a second will be issued in December 2009. For information on this program, visit www.adaptcouncil.org (the AAC website).

Suffice to say that turf managers need to follow the basics of turf management to help minimize weed populations in sports fields. Turf researchers and extension staff also need to go back to basics and investigate how these practices work without the pesticide tools that were available in the past. We also need to help validate and fine tune how some of these new products are used and how to make them work better. There is work to be done on selecting turfgrass species and cultivars for their ability to out-compete weeds. Hopefully, the answers will be forthcoming with all the effort focused on managing turf without pesticides. ♦

Turf managers need to follow the basics. Sound turf management practices help minimize weed populations in sports fields. Turf researchers also need to go back to the basics now that pesticides are banned.

References

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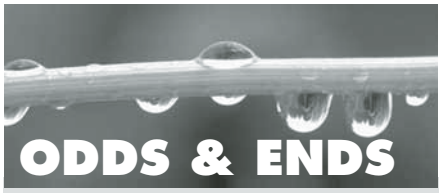

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