SPORTS TURF MANAGER

... for safe, natural sports turf

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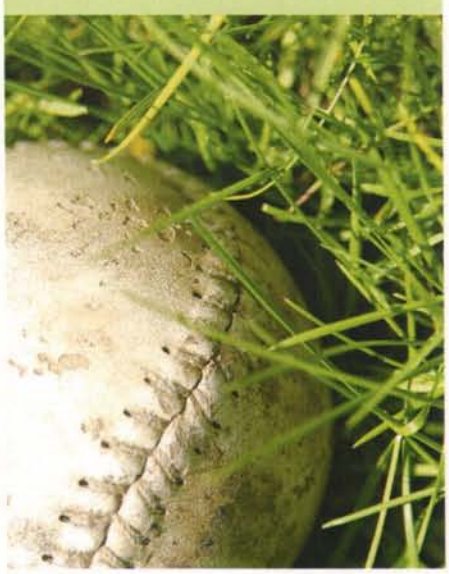
VOLUNTEERS NEEDED!

Volunteers are being sought to serve as committee members on the Field Day and *Sports Turf Manager* Editorial Committees. Get involved with your association! No experience is necessary! This is a great networking and professional development opportunity. Contact Lee at the STA office for further information.



ONTARIO Turfgrass SYMPOSIUM

IPM Lawn Demonstration Project

YEAR 2 REPORT BY RESOURCE TECHNICIAN GEMA CHEONG

The Municipal Integrated Pest Management Lawn Demonstration Project began in spring 2003 and continued on the same areas in spring 2004 (see cover article in the Summer 2004 *Sports Turf Manager*). This project compared and demonstrated the effectiveness of conventional, Integrated Pest Management (IPM), alternative, and no-pesticide approaches to lawn maintenance.

The conventional approach uses chemicals exclusively for pest control. IPM is a process that uses all necessary techniques to suppress pests and sustain healthy landscapes. This is achieved by managing turfgrass to prevent problems and using thresholds to decide how and when to treat pests. The alternative management program uses organic pesticides, Corn Gluten Meal and Nature's Weed and Feed (beet juice extract), for pest control. Lastly, no pest control is applied under the no-pesticide management program.

The trial was established in three municipal settings (Guelph, Brantford, and London) to show the impact that the different lawn maintenance programs have on areas with slightly different microclimates, pest pressure and soil types.

This study also provided an opportunity for communication with area residents, municipal staff and turf mana-gers regarding the different alternatives of lawn care programs.

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Above: Overall layout of plots at the Guelph Turfgrass Institute, Guelph, Sept. 8, 2004.

Cover Story Continued: Year 2 of the Municipal IPM Lawn Demonstration Project

GEMA CHEONG, RESOURCE TECHNICIAN, ONTARIO PARKS ADVISORY COMMITTEE

Study Description

The study was established in three municipal settings: Guelph, Brantford and London. At Guelph, the plots were located at the Guelph Turfgrass Institute (GTI). There were 32 plots, 9 x 5.5 m each, with a total demonstration area of 1,584 m^2. There were four management programs and they included: conventional, IPM, alternatives, and no-pesticides, see Figure 2.

At Brantford, the plots were located at the Glenhyrst Art Gallery, near the Grand River. There were three management programs and they are as follows: conventional, IPM, and no-pesticides. There were 24 plots, 7 x 5 m each, with a total demonstration area of 840 m^2, Figure 3.

In London, the plots were located at Watson Park, near the Thames River. There were 2 management programs: IPM and no-pesticides, and consisted of 16 plots, 10 x 4.5 m each, with a total demonstration area of 720 m^2, Figure 4.

Figure 2. Plot plan at the Guelph Turfgrass Institute, Guelph.

Irrigated 4 cm mowing height		Irrigated 8 cm mowing height	
Fertility	**No Fertility**	**Fertility**	**No Fertility**
Conventional IPM Alternative No Pesticides	Conventional IPM Alternative No Pesticides	Conventional IPM Alternative No Pesticides	Conventional IPM Alternative No Pesticides
Non-Irrigated 4 cm mowing height		**Non-Irrigated 8 cm mowing height**	
Fertility	**No Fertility**	**Fertility**	**No Fertility**
Conventional IPM Alternative No Pesticides	Conventional IPM Alternative No Pesticides	Conventional IPM Alternative No Pesticides	Conventional IPM Alternative No Pesticides

Figure 3. Plot plan at the Glenhyrst Art Gallery, Brantford.

Irrigated 4 cm mowing height		Irrigated 8 cm mowing height	
Fertility	**No Fertility**	**Fertility**	**No Fertility**
Conventional IPM No Pesticides	Conventional IPM No Pesticides	Conventional IPM No Pesticides	Conventional IPM No Pesticides
Non-Irrigated 4 cm mowing height		**Non-Irrigated 8 cm mowing height**	
Fertility	**No Fertility**	**Fertility**	**No Fertility**
Conventional IPM No Pesticides	Conventional IPM No Pesticides	Conventional IPM No Pesticides	Conventional IPM No Pesticides

In all three municipal settings, demonstration trials were set up on established, predominantly Kentucky bluegrass turf with an existing moderate level of weed infestation.

In all three municipal settings, the demonstration trials were set up on established, predominantly Kentucky bluegrass turf with an existing moderate level of weed infestation. The plots of each demonstration trial were divided into four lawn care management programs: conventional, IPM, alternative and no-pesticide. Within each management program, the plots were subdivided into three superimposed treatments including: fertility (2.0 kg/100 m^2 of nitrogen), mowing height (4 cm vs 8 cm) and irrigation to demonstrate the effect that these treatments have on turf quality. The amount of irrigation was based on rainfall values. However, due to the large amount of rainfall over the season and hence lack of visual turf dormancy, we were unable to demonstrate irrigation versus non-irrigation effects.

The trial started at all three locations at the beginning of June and continued until mid-November. Visual ratings and mowing were carried out weekly while the application of fertilizers, the monitoring of pests, and the application of pest control were carried out according to each of the four management programs and their superimposed treatments. A summary of the monitoring and insect sampling techniques is provided in Table 1 (pg. 8).

Results

Guelph Turfgrass Institute (GTI)

Turf Quality: Overall turf quality was highest in conventional plots, followed by IPM, alternative and no-pesticide plots,

Figure 4. Plot plan at Watson Park, London.

Irrigated 4 cm mowing height		Irrigated 8 cm mowing height	
Fertility	**No Fertility**	**Fertility**	**No Fertility**
IPM No Pesticides	IPM No Pesticides	IPM No Pesticides	IPM No Pesticides
Non-Irrigated 4 cm mowing height		**Non-Irrigated 8 cm mowing height**	
Fertility	**No Fertility**	**Fertility**	**No Fertility**
IPM No Pesticides	IPM No Pesticides	IPM No Pesticides	IPM No Pesticides

respectively. In addition, the turf quality within each management program was affected by the superimposed effect of fertility and mowing. Fertility improved turf colour, density and reduced weed population. While a higher mowing height (8 cm) improved turf density and reduced weed population.

Broadleaf weed: There was no observable reduction in percent broadleaf weed cover in both conventional and IPM plots because they had very few broadleaf weeds to start with. As to the alternative plots, a gradual reduction in weed cover has been observed throughout the season with an average reduction of 54.35%. In the no-pesticide plots, the percent weed cover was similar throughout this season, as compared to the increasing percent weed cover observed throughout last season.

Crabgrass: Crabgrass was not found in any of the plots of all four management programs. The effect of conventional, IPM and alternative programs on crabgrass control could not be examined.

Turf Insects: Both hairy chinch bug and sod webworm were not found in any of the plots of all four management programs. One grub was found in a no-pesticide plot, which is below the IPM threshold level of grubs.

Brantford

Turf Quality: Overall turf quality was highest in the conventional plots, followed by IPM and no-pesticide plots, respectively. The application of fertility and higher mowing height also improved the colour and density of the turf. The effect of fertility was particularly prominent in the no-pesticide plots, where the visual ratings were high enough to be similar to those of IPM plots. The high visual ratings of the fertilized no-pesticide plots were mainly contributed by the low percentage of broadleaf weed cover.

Broadleaf weed: Percent reduction in broadleaf weed cover was hardly observable in conventional plots because they had very few broadleaf weeds to start

Table 1. Summary of monitoring and insect sampling techniques.

Pest	Time of Monitoring	Sampling (5 samples/plot)	Threshold (0.1 m^2)	Treatment
European chafer *Rhizotrogus majalis* Japanese Beetle *Popillia japonica*	Early spring: grub damage check Late spring to summer: treat with Merit if significant damage from previous year in local area & large adult flights Late summer: if not treated, monitor & treat curatively if grubs present Fall: monitor to determine treatment success	Cup changer	> 2 per plug on irrigated turf; 0.5-1 per plug on non-irrigated	Merit
Hairy Chinch Bug *Blissus leucopterus hirtus*	Mid summer	Turf plug in bucket	> 20-25 per plug	Sevin
Sod Webworm Crambus sp. *Chrysoteuchia Topiaria*	Fall	Soap solution (30ml liquid soap in 8L water/m^2)	>6 per flush	Success
Broadleaf weeds	Early spring, late summer, late fall	grid (25 points per sample)	10-15% weed coverage/plot	Par 3
Crabgrass	Spring	grid (25 points per sample)	10-15% weed coverage/plot	Acclaim Super

with. In the IPM plots, reduction in broadleaf weed cover was observed. The no-pesticide plots showed a general reduction in broadleaf weed cover over the season and the percent broadleaf weed cover was much higher in the non-fertilized than the fertilized no-pesticide plots.

Crabgrass: Crabgrass was found in all three management programs but in numbers below the IPM threshold level of crabgrass, with the exception of one no-pesticide plot. Hence, all but one plot that contained crabgrass were spot-treated rather than broadcasted with herbicide.

Turf Insects: Hairy chinch bug, sod webworm and grubs were found in all three management programs but in numbers below their IPM threshold levels.

London

Turf Quality: Overall turf quality was higher in the IPM than the no-pesticide plots. In addition, the turf quality within both management programs was affected by the superimposed effect of fertility and mowing. The application of fertility and mowing at a higher mowing height improved the colour and increased the density of turf.

Broadleaf weed: Percent broadleaf weed cover was greatly reduced over the season in the IPM plots and remained relatively the same throughout the season in the no-pesticide plots, Figure 5.

Crabgrass: Crabgrass was found in the plots of both management programs, but in numbers below the IPM threshold level for crabgrass. Hence, all plots that contained crabgrass were spot-treated rather than broadcasted with herbicide.

Turf Insects: Hairy chinch bug, sod webworm and grubs were found in both management programs but in numbers below their IPM threshold levels.

Effect of Fertility on Broadleaf Weed Cover at all Three Locations

The application of fertilizer has been observed to improve turf quality by increasing the 'greenness' and density of turf under all four management programs. In addition, the percent broadleaf weed cover was generally lower in fertilized no-pesticide plots as compared to non-fertilized no-pesticide plots, Figure 6. Such phenomenon was observed in all fertilized no-pesticide plots located at all three municipalities in both season 1 and 2.

Overall Pesticide Reduction

The breakdown of the number of pesticide applications among the four lawn care management programs in the three municipalities is illustrated in Table 2 (pg. 10). Overall, there was a 50-66.67% reduction in the number of pesticide applications in the IPM plots as compared to conventional plots in Brantford and London. In terms of the volume of herb-

icide use, there was an overall 48.2% reduction in herbicide use in IPM plots as compared to conventional plots in Brantford and the GTI, Figure 7 (pg. 10). Only herbicide reduction was taken into consideration because turf insects were present at numbers below their IPM threshold and consequently, no insecticides were sprayed in the IPM plots. This reduction was mainly a result of spot-treating broadleaf weeds and crabgrass instead of broadcasting them with herbicide.

Educational Opportunities

Different types of communication and educational opportunities were provided by the project throughout the season. At the GTI, the Annual GTI Research Field Day was held on August 17, 2004 and approximately 75 members of the turf industry including turf managers, researchers and personnel of lawn care companies came to visit the plots and enquire about the results of the projects. The Master Gardener Training Program was also held at the GTI and about 60 gardeners visited the plots.

At Brantford, the demonstration project received press attention through an article in the *Expositor*, a local newspaper. In addition, the City of Brantford participated in the Communities in Bloom competition and juries of the competition visited the plots at Glenhyrst Art Gallery and received a detailed description of the project. Furthermore, a sign illustrating the purpose and method of the project was created and it provided information of the project to members of the public that pass by the park of the Glenhyrst Art Gallery.

Figure 5. Difference between control (left) and 4 cm fertilized IPM plot (right). London, November 3, 2004.

Figure 6. Average percent broadleaf weed cover of no-pesticide plots at the GTI in season 1 and 2.

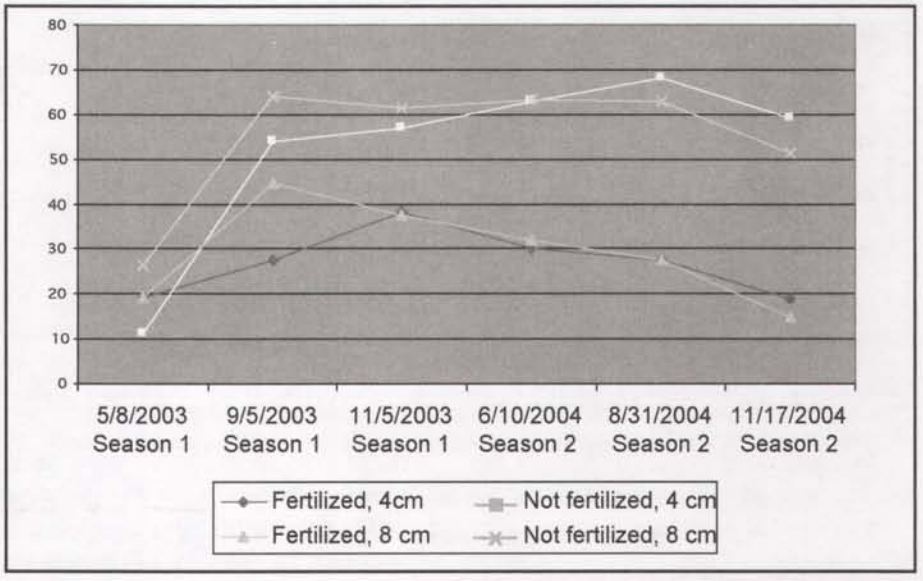
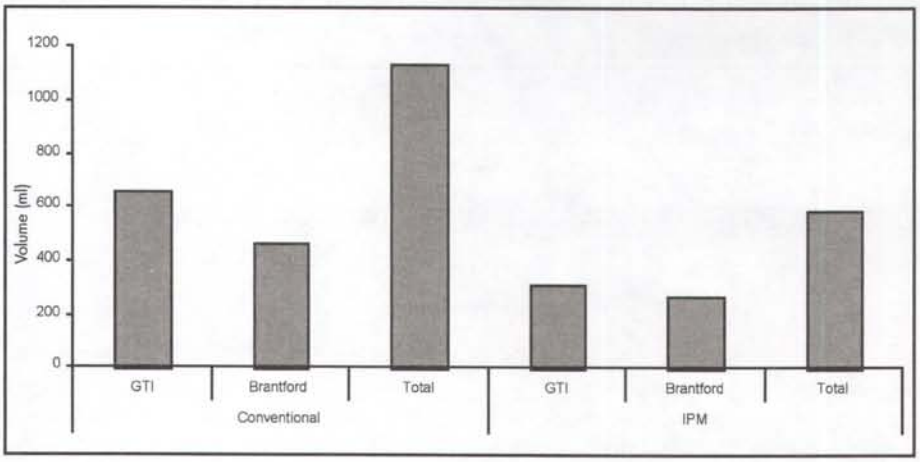


Table 2. The total number of pesticide applications among the four lawn care maintenance programs.

Location	Treatments	Par III	Dimension	Acclaim	Sevin	Merit	Nature's Weed & Feed	Corn Gluten Meal	Total
GTI	Conventional	2	1	1	1	1	0	0	6
	IPM	2	0	0	0	0	0	0	2
	Alternative	0	0	0	0	0	4	1	5
	No Pesticide	0	0	0	0	0	0	0	0
Brantford	Conventional	2	1	1	1	1	0	0	6
	IPM	2	0	1	0	0	0	0	3
	No Pesticide	0	0	0	0	0	0	0	0
London	IPM	2	0	1	0	0	0	0	3
	No Pesticide	0	0	0	0	0	0	0	0

Figure 7. Comparison of the volume of herbicide use in the conventional and IPM plots at Brantford and the GTI.



At London, questions regarding the project were sometimes produced by the park users of Watson Park.

Conclusions

Turf quality was highest in conventional followed by IPM, alternative and no pesticide programs. Despite the 50-66.67% reduction in the number of pesticide use or the 48.20% reduction in the volume of herbicide use in IPM plots as compared to conventional plots, the quality of the turf in IPM plots was only reduced slightly. In addition, mowing at a higher height (8 cm) improved the density of turf, while the application of fertilizer improved turf colour and density and reduced broadleaf weed cover in the no-pesticide plots. The manifestation of turfgrass insects was not an issue in any of the three municipalities. They were all present in numbers below the threshold for IPM pest control. Crabgrass infestation was also not a problem. It was only found at Brantford and London in numbers below its IPM threshold level, with the exception of one plot. As for broadleaf weed cover, a couple of trends were observed. At the GTI, the percent of broadleaf weed cover of no-pesticide plots was similar throughout season 2, as opposed to its gradual increase throughout season 1. Broadleaf weed cover of the alternative plots at the GTI reduced gradually throughout season 2, while no trend was observed in season 1. At Brantford, broadleaf weed cover of both IPM and no-pesticide plots was observed to reduce throughout the season. At London, broadleaf weed cover was much reduced in the IPM plots and remained relatively similar throughout the season in the no-pesticide plots.

In season 3, the impact of IPM, alternative and no pesticide programs on turf quality is expected to increase. We hope to examine if pest infestation and the effectiveness of pest control will change, and monitor the further development of the trends of broadleaf weed cover. The effect of irrigation on turf quality can also be examined if there is less rain in season 3. In addition, the effectiveness of Nature's Weed and Feed can be better examined if the application begins earlier in the season. In terms of educational opportunities, we hope to have open houses in all three municipalities in order to convey the purpose and results of the project to more members of the general public.

For further information regarding this project, please visit the project website at www.gti.uoguelph.ca/OPA. It contains general information, photos, presentation slides and final reports of the project

Acknowledgements

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