

For more on alternatives to pesticides...

Turn to page 25 for recent research findings on fall applications of an iron chelate herbicide on broadleaf turf weeds.

products. The program included the same elements that so many communities are now using today: monitoring/scheduling, mowing, fertilizing, aerating, topdressing, overseeding, irrigating, dethatching, alternatives, and education and training.

The outcome of Waterloo's efforts can be demonstrated by the fact in 1979 we sprayed 36% of our greenspaces. By the year 1993 it was down to 0.5%, and today, of course, we do not spray at all in accordance with the ban.

Table 1 summarizes the base program costs (excluding overheads) for the City of Waterloo in 2008 on non-irrigated and irrigated multi-use fields and on an irrigated baseball field. The pesticide ban has had minimal impact on our most recent years operating budgets as we have programmed the cost into our operations since the 1980s.

We continually monitor, inspect and renovate our turf. We look for alternative ways of doing things including sand injection, utilizing a Blec sandmaster, building fields to recommended standards, and investing in artificial turf fields.

The Plant Health Care Program at the City of Waterloo has been successful as a result of the involvement and commitment of staff, redefining how we work, political will, citizen involvement, and requesting the necessary budget when opportunities were available. In doing so, the pesticide ban has had a minimal effect on City of Waterloo operations.

City of Oshawa

Oshawa has 150,000 residents. The city maintains 126 parks comprising 953 acres (maintained parkland), 50 rectangular fields, 54 ball diamonds, 7,766 linear metres of landscape buffer strips, 67 shrub/perennial beds and 91 annual beds.

Oshawa instituted a Pest Management Program, approved by Council, in 2003. This was put in place as an alternative to a pesticide ban and had the goal of reducing or eliminating the use of pesticides while

Table 1. A summary of base program costs (excluding overheads) for the City of Waterloo in 2008 on irrigated and non-irrigated multi-use fields and on an irrigated baseball field.

Maintenance Activity	Non-Irrigated Multi-Use Field	Irrigated Multi-Use Field	Irrigated Baseball Field
Inspections	\$100	\$100	\$100
Spring Repairs & Divot Overseeding	\$525	\$650*	\$400
Aerating	\$275	\$400	\$300
Fertilizer & Soil Amend.	\$800	\$800	\$600
Topdressing & Overseeding	\$3,500	\$3,500	\$600
Mowing	\$400	\$800	\$1,000
Irrigation	-	\$500	\$500
TOTAL	\$5,600	\$6,750	\$3,500

*Includes crease overseeding and turf blanket

Table 2. Additional costs incurred by the City of Oshawa due to alternative practices under Ontario's Cosmetic Pesticides Ban.

2009	Cost	Items
Agricultural & Botanical	\$57,500	seed, fertilizer, topdressing
Alternatives	\$50,000	mycorrhizae, corn gluten, alfalfa, worm castings, kelp, gypsum ...
Vegetation Control	\$62,400	vinegar, mulch

Table 3. Costs for cultural practices, labour and equipment, City of Oshawa.

Year	Core Aer.	Slit Aer.	Overseed	Topdress	Fertilize	Alternatives	TOTAL
2006	\$8,270	\$15,537	\$11,402	\$4,400	\$27,132	\$32,863	\$99,640
2007	\$3,237	\$10,252	\$25,137	\$14,474	\$25,620	\$24,310	\$103,030
2008	\$3,336	\$11,827	\$25,248	\$6,142	\$42,892	\$12,206	\$101,651
2009	\$6,597	\$12,000	\$17,695	\$2,500	\$20,414	\$23,410	\$82,616



Your HOMEFIELD ADVANTAGE

Sports Clay



Tools & Accessories



Turf Services



Construction



marcoclay.com | 1.800.950.2555

EECH10152-503-01

EVERGREEN™ Turf Blankets... ...trusted around the world!

**“Results Outstanding...,
Could Not Believe...”**

wrote **Dann Daly**, Park Maintenance Supervisor,
Parks & Recr. Dept., North Smithfield, RI

- Earlier spring green-up
- Faster seed germination
- Deeper root development
- Delays dormancy in fall
- Ideal winter blanket
- 3 & 7 yr. warranty covers
- Best for quick turf repairs
- Available in any size

Want to know more?
CALL TOLL FREE
1-800-387-5808

COVERMASTER™
COVERMASTER
COVERMASTER

MASTERS IN THE ART OF SPORTS SURFACE COVERS

COVERMASTER INC., 100 WESTMORE DR. 11-D, REXDALE, ON, M9V 5C3 TEL 416-745-1811 FAX 416-742-6837



Covers for baseball fields are also readily available.



Covered...



Uncovered...



It works on the greenhouse principle, every time!

EXCESS HEAT ESCAPES THROUGH THE PATENTED VENTING SYSTEM

AIR, WATER AND HEAT PENETRATE THE COVER, WARMING THE SOIL

INCREASES ROOT DEVELOPMENT



maintaining quality turf. As a direct result of this program, an additional \$400,000 was added to the base budget to cover equipment, facilities, three additional staff, materials, and education and outreach. Because of this, Oshawa was well prepared for the 2009 pesticide legislation and the impacts were less than they may have been otherwise.

The new pesticide legislation resulted in some additional costs to Oshawa related to alternate practices. These are summarized in Table 2.

In order to better focus efforts to promote healthy turf, Oshawa engaged the Guelph Turfgrass Institute to carry out a \$50,000 study. This provided for a comprehensive report and included recommendations for:

- Procedures
- Monitoring techniques
- Fertilizing schedule based on soil tests
- Maintenance schedule for compaction, overseeding and topdressing
- Field use (open/close dates)
- Education and outreach programs
- Equipment purchases
- Drainage improvements
- Development standards
- Provision for skilled staff
- Staff training

A summarized report was provided for user groups.

The City of Oshawa has implemented use of a number of alternative products to replace traditional pesticides. These include:

- Calcium powder for compaction
- Corn gluten to prevent weed germination
- Compost: nutrients, bacteria, fungi
- Worm castings: nutrients, bacteria, fungi
- Crumb rubber to prevent damage
- Granular and liquid fertilizers
- Gypsum to prevent salt damage, compaction
- Kelp for nutrients
- Seed: endophytic, sun/shade, rhizomes, perennial rye (fast germination but clumps)
- Topdressing to match native soil
- Horticultural vinegar (hard surfaces)

Table 4. Typical costs for a rectangular field, City of Oshawa, 2009.

Item	Quantity	Product	Man Hours	Equipment	TOTAL
Soil test	1/year	\$15	\$5	\$20	\$40
Aerate	2/month	n/a	\$130	\$120	\$256
Overseed	2/year	\$1,440	\$78	\$100	\$1,618
Fertilize G*	1/month	\$560	\$364	\$231	\$1,155
Fertilize L**	1/month	\$500	\$364	\$231	\$1,095
Compost	1/year	\$20	\$156	\$100	\$276
Grass cutting	1/week	n/a	\$348	\$1,363	\$1,711
TOTAL					\$6,151

* G, granular ** L, liquid

Table 5. Cost comparisons for hard surface treatments, City of Oshawa.

	Product Cost	Wages & Equipment	TOTAL
Roundup 2007	\$1,000	\$7,428	\$8,628
Vinegar 2009	\$12,000	\$11,643	\$23,643

Table 6. Modified practices due to the pesticide ban, City of Mississauga.

Location	Existing Practice	New Practice
Specialized Horticultural Beds	Pesticide treatment to deal with diseases, fungus etc.	Class 11 pesticides
Shrub & Perennial Beds	Hand weeding, mulching	No change
General Parkland	Periodic cultural practices	No change
Minor Fields	Periodic cultural practices	No change
Lit Irrigated Fields	Cultural practices, spot spraying	Cultural practices, periodic resodding
Baseball Warning Tracks	Roundup	Roto tilling; alternate surface
Boulevards	Bi-annual spraying	Cultural practices, Class 11 pesticides
Hard Surfaces	Bi-annual spraying	Class 11 pesticides
Forest Infestations	Treatment as needed (e.g. BTK)	No change
Invasive/Harmful Plants	Treatment as needed	No change, MNR approval required

In addition a number of cultural practices have been used

- 3" cutting height
- Overseeding & topdressing
- Fertilizing (granular and liquid)
- Aerating (core and solid tine)
- Soil tests
- Monitoring of fields and customized maintenance based on conditions

Costs for these cultural practices are shown in Table 3. Because of the previous Pest Management Program, the pesticide ban did not significantly change these costs. Table 4 illustrates the practices and costs for a typical high end grass field in Oshawa.

While overall implications and costs have been minimal, the pesticide ban has had major impacts on how Oshawa treats hard surfaces. Standard practices include the use of horticultural vinegar for downtown areas every two weeks, including treatment of warning tracks, tennis courts, intersections, walkways and sidewalks. Monthly newspaper ads were used in place of posting signs. Incremental costs for hard surface treatments were \$1,875 monthly ads, \$11,000/year product and \$12,800/yr wages, equipment for a total of \$25,675. Cost comparisons are provided in Table 5.

City of Mississauga

Mississauga Parks and Forestry serves 700,000 residents. The city has 500 parks (includes greenbelts and woodlands), 253 sports fields, 138 ball diamonds and 250,000 street trees. In 1995, Mississauga Council approved a policy which resulted in a 95% reduction in pesticide use. The policy included:

- No pesticide use for general parkland
- Spot spraying only for sports fields

- Use for high end horticulture
- Use for hard surfaces and boulevards
- Use for harmful/invasive plants

In addition, Mississauga proactively initiated increased development of artificial fields (currently have six). The 1995 changes also resulted in increased hand weeding of beds, more mulching, and the institution of cultural practices similar to those used in Oshawa. As a result of the 2009 provincial legislation, some operational practices have been modified. These are summarized in Table 6.

As noted previously, cultural practices (fertilizing, aeration, topdressing and overseeding) have been embedded in our



operating budgets since the mid 1990s so the pesticide ban did not impact operating costs from this perspective. The average cost for a major lit field remains at \$8,700. It is anticipated however that major turf renovations may be required eventually for some fields. This would represent a periodic cost of \$200,000.

A major impact of the 2009 legislation has been changes in the maintenance of baseball warning tracks. This job now requires six staff for 2-4 hours. Previously, using Roundup, one staff person could treat a warning track in an hour. This represents incremental labour costs of \$500

per diamond per treatment.

Another cost increase that has to be budgeted for is hard surface maintenance. Treating twice per year with horticultural vinegar results in incremental costs of \$50k. Lastly, the impact on specialized horticulture like roses and rhododendrons has yet to be determined, though no major problems have surfaced as of yet. Overall, the history of pesticide policy in Mississauga put the city in a good position to deal with the new provincial legislation

Conclusion

All three municipalities implemented pesticide reduction programs prior to the *Cosmetic Pesticides Ban Act*. As a

consequence, many of the practices and alternative products to allow for effective maintenance under the new legislation were already in use. So while there were incremental costs in some specific areas, impacts were not as severe as they might have been.

All Ontario municipalities and other turf managers will need to continue to adapt to the changing "tool kit" available to them as a result of legislative changes. It is hoped that research and innovation on the part of turf managers will allow for more effective alternative products and practices for the future.

 **EQUIPMENT LTD.**
ISO 9001 REGISTERED

Paul Turner
Sales Representative

(416) 566-0211 • pturner@rogers.blackberry.net

1184 PLAINS ROAD EAST, BURLINGTON, ON L7S 1W6
Burlington (905) 637-5216 Toronto (905) 338-2404
1-800-883-0761 • Fax: (905) 637-2009 • www.gcduke.com

 **PLANTPRODUCTS**

Turf MVP • Grass Seed
Turf & Tree Fertilizers
Pest Control Products

Plant Products Co. Ltd.
Brampton, Ontario
905-793-7000 or 1-800-387-2449
Fax 905-793-9632 • plantprod.com





Visual Observations

Figure 1 (inset). Brown dandelion leaves 48 hours after Fiesta™ application.

Figure 2 (main photo). Blackened leaves of narrow-leaf plantain 48 hours after treatment with Fiesta™.

Efficacy of Iron Chelate Herbicide for Turf Broadleaf Weed Control

Pam Charbonneau, Ontario Ministry of Agriculture, Food and Rural Affairs

Objective

To evaluate the efficacy of fall applied iron chelate for control of broadleaf weeds in turf.

Experimental Design/Methods

Plots were located in a turf research area at the Guelph Turfgrass Institute, Guelph, ON. The site is an area of established turf (a mixture of Kentucky bluegrass and turf-type perennial ryegrass infested with dandelions, black medick, narrow-leaved plantain and other lawn weeds). Turf was maintained as a low maintenance turf with weekly mowing at 6 cm, no supplemental irrigation and fertilized once a year with 0.5 kg N/100m².

Table 1. Treatments.

Treatment	Active Ingredient Rate (mL/m ²)	Product Rate (mL/ m ²)
1. Weedy check		
2. Par III (2,4 D, mecoprop & dicamba)	0.55 mL	0.55mL/30mL water
3. Fiesta™ (lowest label rate)	8.6 mL	200 mL*
4. Fiesta™ (highest label rate)	17.2 mL	400 mL*
5. Fiesta™ (2x the highest label rate)	34.4 mL	800 mL*

* volume of 1 part Fiesta™/24 parts water mixture/m²

The treatments were 1) three different rates of Fiesta™ (active ingredient iron in the form of FeHEDTA, 4.43%) Neudorff Canada, 2) Par III (a commercially available three way broadleaf herbicide consisting of 2,4 D, mecoprop and dicamba) applied at label rate and 3) a weedy check for a total of five treatments (see Table 1). Fiesta™ was diluted with one rate (1 part Fiesta™ with 24 parts of water and the diluted product was applied at 3 different volumes). The volumes of diluted product were 200 mL/m², 400 mL/m² and 800 mL/m². Each treatment was replicated four times in 2 x 2 m plots in a randomized complete block design. Percent cover of each weed species (dandelion, black medick, narrow-leaved plantain, clover and mouse-eared chickweed) was recorded in each plot at 7, 20 and 34 and 203 days after treatment on Oct. 16, 2009, Oct. 29, 2009, Nov. 13, 2009 and April 30, 2010 respectively. All measurements were analysed by the appropriate statistical analyses.

Application of the Treatments

The 200 mL/m² and 400 mL/m² rates of Fiesta™ and Par III were applied using a CO₂-powered bicycle sprayer at 20 psi. The 800 mL/m² of 1 part Fiesta™/24 parts water was applied using a standard 4 L watering can. All treatments were applied on Oct. 9, 2009.

Efficacy Assessments

Efficacy assessments were made Oct. 16, 2009, Oct. 29, 2009, Nov. 13, 2009 and April 30, 2010 at 7, 20, 34 and 203 days after treatment (DAT). Four randomized point quadrats measuring 60 cm x 60 cm with 25 points in each quadrat (points 10 cm apart) for a total of 100 points in each plot were used to record estimated percent broadleaf weed cover of dandelion, black medick, narrow-leaved plantain, broad-leaved plantain, clover and chickweed per plot at each assessment date.

Weed cover of each of the weed species mentioned previously was also measured prior to the start of the experiment on Oct. 5, 2009. Only data on percent dandelion, percent narrow-leaved plantain and black medick will be presented. The percentages of broad-leaved plantain, clover and chickweed were too low to give significant

differences and will not be presented in this report.

Results and Discussion

Visual Observations. Observations made within 24 hours of applying Fiesta™ showed that the turf responded to the iron by greening up. This green up lasted the entire duration of the experiment, including at the final rating on April 30, 2010. Within 24 hours of applying Fiesta™, the leaves of dandelions and black medick turned black and within 48 hours the leaves appeared brown and shriveled (Figure 1). The lower leaves of narrow-leaved plantain turned black within 48 hours but the smaller newer leaves at the centre of the rosette remained green and healthy (Figure 2).

More trials are now underway at the Guelph Turfgrass Institute on Fiesta™ rates, timing (spring applied vs. fall applied) and with and without re-application. By the end of the 2010 season, we should have a much clearer idea of how well this product works.

Dandelion. For dandelions, all rates of Fiesta™ reduced the % dandelion cover to < 1% by Oct. 16, 2009. All the Fiesta™ rates were not significantly different from each other but were significantly better than the weedy check and the Par III at reducing % dandelion cover. By Oct. 29, 2009, the % dandelion cover increased to 2.25, 2.75 and 3.5 % for the 200 mL, 400 mL and the 800 mL Fiesta™ rates respectively, but these rates were not significantly different from one another or from Par III, but they were significantly better than the weedy check. By Spring 2010 there were no significant differences in % dandelion cover between the weedy check or any of the Fiesta™ rates showing almost 100% re-growth of the dandelions. The only plots with significantly fewer dandelions in the spring were the Par III treated plots.

Black Medick. The % black medick cover was also less than 1% for all of the rates of Fiesta™ by Oct. 16, 2009 and all the Fiesta™ treated plots were significantly better than the Par III at that date. The % black medick cover had increased by

Oct. 29, 2009 to 5.75, 1.25 and 2.75 for the 200 mL, 400 mL and 800 mL rates of Fiesta™ respectively. The % black medick of the 400 mL rate was significantly lower than the 200 mL rate but not significantly different than the 800 mL rate of Fiesta™ rates for that date. There was significant re-growth of the black medick also. The most significant re-growth was at the 800 mL and the 200 mL rate. This is probably an interaction between the application method and the application rate. The 200 mL rate was the lowest rate and was applied with the pressurized bicycle sprayer with good coverage. The highest rate had more product applied but it was applied with a watering can and the coverage was not as good. By Nov. 13, 2009, there was significant re-growth with the 200 mL rate. The other Fiesta™ rates (400 mL and 800



mL) had less re-growth and did not differ significantly from each other. By spring 2010, the % black medick cover of all the Fiesta™ plots had increased. The 200 mL and 400 mL rate were not significantly better than the control but the 800 mL rate was significantly better than the weedy check with 5% black medick coverage.

Narrow-leaved Plantain. The effect of Fiesta™ on narrow-leaved plantain was slower than for dandelions and black medick. At the last rating in the fall (Nov. 13, 2009), all of the Fiesta™ treatments and Par II were significantly better than the control. By the spring, the % narrow-leaved plantain in all the plots, including

the weedy check was down from the start of the experiment, so there is something about the growth habit of narrow-leaved plantain. It is at its largest in the fall and plants are smaller the following spring, regardless of whether they have been treated with Fiesta™ or Par III. At the spring rating there was no herbicide effect due to either Fiesta™ or Par III.

Conclusions

The new broadleaf herbicide Fiesta™ (active ingredient iron in the form of FeHEDTA, 4.43%) provides a very quick defoliation of dandelion and black medick in a mixed stand with turf at all rates applied in this experiment. When applied as a broadcast application it also results in the greening up of the turf. All of the Fiesta™ rates showed some re-growth of dandelions regardless of which of the rates were used (200 mL, 400 mL or 800 mL). By the following spring the % dandelion cover was back up to the same level as at the beginning of the experiment for all of the Fiesta™ rates used in this trial. The Fiesta™ label does state that you can “repeat once in 4 or more weeks.” In this experiment, Fiesta™ was not re-applied

because the application in early October did not allow time for a re-application before the onset of winter.

The re-growth of black medick was significantly higher by the last rating date in 2009 for the 200 mL rate. By the following spring, only the 800 mL rate had lower % black medick cover than the weedy check. The 200 and 400 mL rates had re-growth equal to the weedy check. Again, the second application that is allowed on the label at 4 or more weeks after the first was not applied, so this experiment does not shed any light on how well the Fiesta™ would work at controlling black medick with 2 applications 4 weeks apart.

The situation with the narrow-leaved plantain was a bit different than the dandelion or black medick. The Fiesta™ did not result in a quick defoliation. Instead, the % narrow-leaved plantain cover decreased at each rating date for all of the Fiesta™ rates and decreased more quickly than in the plots treated with Par III. By the spring, the % narrow-leaved plantain was almost completely gone from all of the plots, including the weedy check. This indicates that the growth habit of the narrow-leaved plantain is such that it is slow to re-grow

in the spring regardless of whether it has been treated with a herbicide or not. Again, a second application was not applied and the results may be quite different with a second application.

More trials are underway at the Guelph Turfgrass Institute on Fiesta™ rates, timing (spring applied vs. fall applied) and with and without re-application. There are also trials underway that follow tagged individual weeds (dandelions, black medick, narrow-leaved plantain, broad-leaved plantain and clover) that have been treated with Fiesta™ to evaluate re-growth. By the end of the 2010 season we should have a much clearer idea of how well this product works.

Acknowledgements. Thanks to Cameron Wilson, Neudorff Canada, for supplying the Fiesta™.

STM EDITORIAL CONTENT

Opinions expressed in articles published in the “Sports Turf Manager” are those of the author and not necessarily those of the STA.



ZANDER
SOD CO. LIMITED

Suppliers of Top Quality Turf Products for over 50 years

No. 1 Kentucky Bluegrass * Bentgrass * Extreme Fescue
Large and small rolls * Custom grown sod available

(877) 727-2100 (416) 364-5700

www.zandersod.com





and get it RIGHT!

AERASEEDER

...for an easy way to denser turf.

100 Union Street, Elmira, Ontario, Canada N3B 2Z2
1-877-467-3478 • www.reistindustries.com

Like our new look?

THE SPORTS TURF MANAGER IS NOW FULL COLOUR!

We keep professionals updated on leading research, STA programs and activities, and industry information and coming events. Because of its highly specific turf-related readership base, Sports Turf Manager has proven to be a successful venue for industry advertisers. For more information, contact Lee at the STA office.



99 John St. North, Box 171
Harriston, Ontario
N0G 1Z0
Phone (519) 338-3840
Fax (519) 338-2510
Email spearese@wightman.ca

SUPPLIERS OF PREMIUM TURF SEED PRODUCTS