What Smells Like Sour Milk & Controls Leguminous Weeds?

Pam Charbonneau, OMAFRA Turfgrass Specialist

As usual there has been a flurry of work at the Guelph Turfgrass Institute evaluating how effective some of the new bio-pesticides are at controlling turf pests. Two broadleaf herbicides came on the market this summer, Fiesta™ and Organo-sol®, and were the suject of research by myself and Cynthia Siva, a graduate student of Dr. Katerina Jordan. We both had Fiesta in our trials and Dr. Ken Carey also did several crop tolerance and rate trials with Fiesta. All of these results will be reported on at the Ontario Turfgrass Symposium February 23-24 at the University of Guelph. In this article, I'll focus on Organo-sol's effectiveness in our trials.

Organo-sol is a product developed by Lacto Pro-Tech Inc., which commercializes products made from dairy ingredients that come from a certified food plant. It is a division of the cheese manufacturing company Saputo. Organo-sol is manufactured from lacto-fermented dairy ingredients and the active ingredients are citric and lactic acid (produced by lactic acid bacteria). Summer student Matthew Barnett thought it smelled like a mixture of orange juice and rotten milk and I thought it smelled like baby vomit. If you look at the ingredients, it is pretty close to both!

Organo-sol is labelled for the control of bird's-foot trefoil, black medick, clover and wood sorrel in established lawns. The product is applied as a mixture of 25% Organo-Sol, 3% surfactant and 72% water and applied at a rate of 200 mL per m^2. The surfactants on the label include XA Oil Concentrate, Kornoil Concentrate and Assist. The application needs to be repeated every 14 days for a total of five applications.

The Research Trial

The trial was conducted following the label rate and timing. Treatments were applied on May 26, June 7, June 21, July 5 and July 19, 2010. The label mixing instructions

EDITOR'S NOTE

See the Summer 2010 issue of Sports Turf Manager where Pam covers the efficacy of fall applied iron chelate, a herbicide for broadleaf weed control.

Figure 1 Above. Organo-sol® treated plot 3 days after treatment showing the grass phytotoxicity. **Figure 2 Inset.** A close-up of grass and weeds treated with Organo-sol showing typical damage several hours after treatment. Notice the damage to clover but not dandelion.

Figure 3. Effect of Organo-sol on Dandelions.

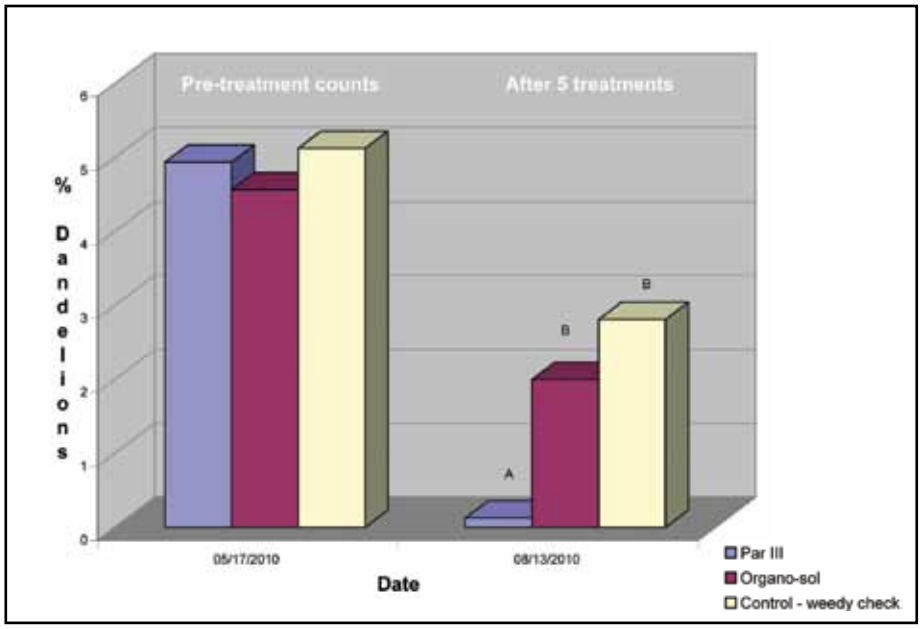
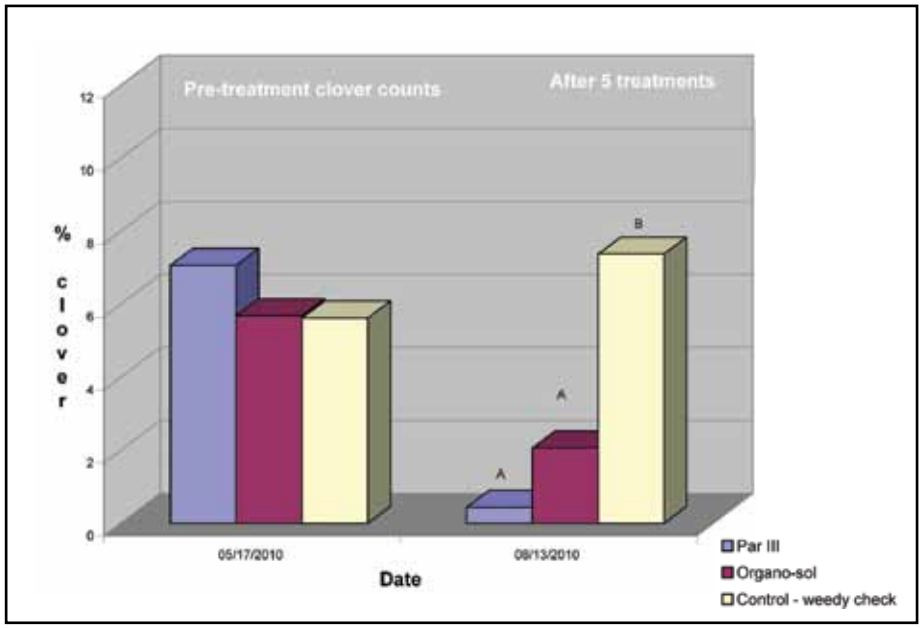


Figure 4. Effect of Organo-sol on Clover.



were followed by a different surfactant that was suggested by Lacto Pro-Tech, LI700 from United Agri-Products. The research site was an area of established turf (a mixture of Kentucky bluegrass and turf-type perennial ryegrass infested with dandelions, black medick, clover, narrow-leaved plantain and other lawn weeds). Turf was maintained as a low maintenance turf with weekly mowings at 6 cm, no supplemental irrigation, and fertilized once a year with 0.5 kg N/100 m^2.

Organo-sol gave poor control of dandelions (but this is known) and good control of clover, black medick and total broadleaf weeds.

The treatments were untreated control, Organo-sol at the label rate, and Par III (a herbicide consisting of 2,4 D, mecoprop and dicamba) applied at label rate. 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, broadleaf plantain, bird's-foot trefoil, clover and mouse-eared chickweed) was recorded in each plot on June 11, June 17, June 30, July 15, July 29 and August 13.

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 each of the broadleaf weed species at each assessment date. All measurements were analysed by the appropriate statistical analyses. The only broadleaf weed species that were in high enough numbers to observe significant differences were clover,

dandelion and black medick and total weeds and only these will be reported here.

Results

Visual observations that were made several hours after treatment showed phytotoxicity to the grass and weed leaves turning them light brown to yellow. The grass phytotoxicity lasted for roughly one week after treatment (Figure 1).

Organo-sol gave poor control of dandelions (Figures 2 & 3), but this is known to the company and dandelions do not occur on the Organo-sol label. Organo-sol did give good control of clover (Figure 4), black medick (Figure 5) and total broadleaf weeds (Figure 6). Organo-sol gave the same level of control for clover and black medick as Par III reducing the clover by roughly 70%. Overall, the total weeds were reduced by Organo-sol by 66%, but the reduction was not as great as the reduction in total weeds with Par III, which was a 95% reduction over the untreated control.

When applied according to the label with the addition of the surfactant LI700, Organo-sol did provide significant control for clover, black medick and total broadleaf weeds in this study. Though not reported here, a trial including Organo-sol was conducted by Cynthia Siva for her Master's research project using the surfactant Assist and the efficacy was much lower than with LI700. What is still unclear is if the level of phytotoxicity that occurs after each treatment and lasts for roughly one week will be acceptable in the marketplace. In addition, the smell of the product is unpleasant – this may also impact its acceptability. Lastly, the need for five applications in a season for efficacy may also be a deterrent.

Figure 5. Effect of Organo-sol on Black Medick.

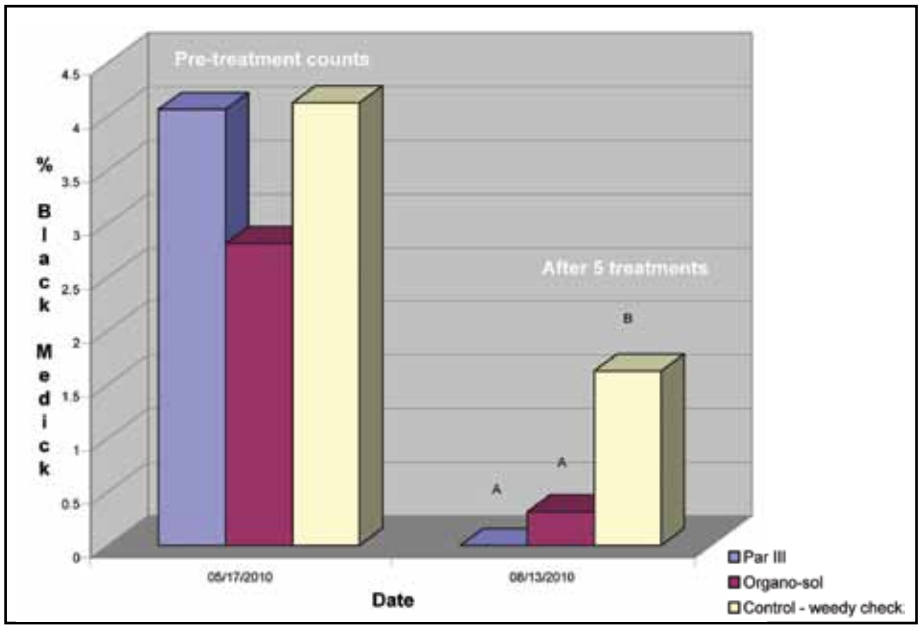
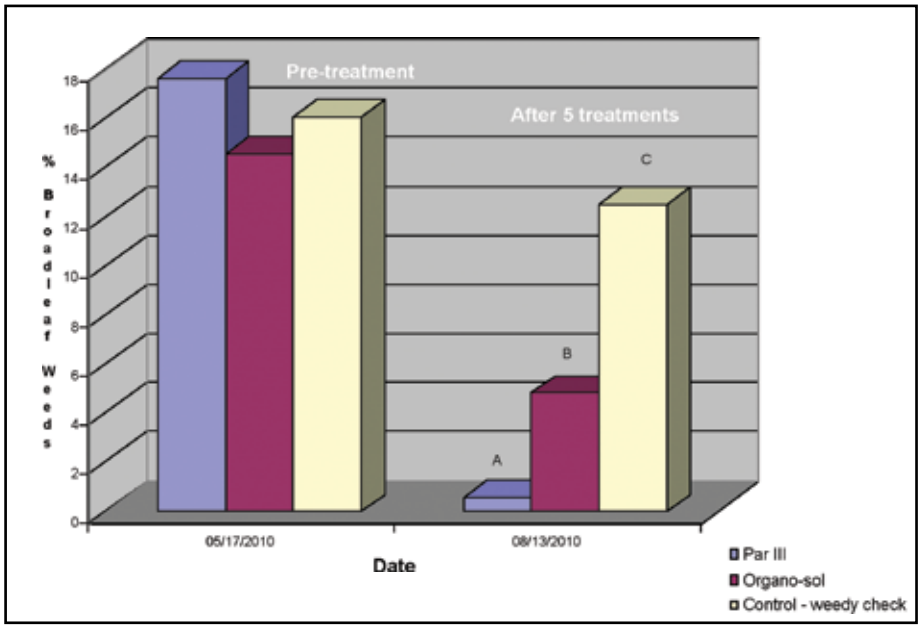


Figure 6. Effect of Organo-sol on Broadleaf Weeds.



Association News

2010 ROBERT W. SHEARD SCHOLARSHIP RECIPIENT

Congratulations Bradley Young!

GUELPH, ON. The Sports Turf Association is pleased to announce the recipient of the 2010 Robert W. Sheard Scholarship. Bradley H. Young is a graduate of the University of Guelph's Associate Diploma in Turfgrass Management and Humber College's Landscape Technician Program. Congratulations, Brad!

As part of the application process, candidates are required to submit an essay on a sports turf-related topic of their choice. Brad has completed his second period as a member of the ground staff at The All England Lawn Tennis and Croquet Club, Wimbledon. Read his essay, "Constructing World Class Tennis Courts" on the next few pages.

The STA Robert W. Sheard Scholarship

In order to encourage, support and provide leadership to those considering a career in the sports turf industry, the STA established a scholarship program in 1993 and has now awarded 28 scholarships. The scholarship program is funded through STA membership fees and is intended to assist with the cost of tuition, books and related expenses.

For scholarship polices, application requirements and an application form, please visit www.sportsturfassociation.com. Submissions for the 2011 award must be received by May 1st for consideration.

LETTER OF APPRECIATION

"Thank you so much for your letter informing me that I am the recipient of the Robert W. Sheard Scholarship. I am pleased to accept the award and hope to live up to the legacy of its namesake.

It is particularly rewarding for me to be honoured by this award having returned to school as a mature student. After working for several years and considering my future, I returned to school at the age of 29 and immediately knew I had chosen the path that was right for me. This early success in the field is particularly gratifying."

Bradley Young

Photos courtesy of Brad Young

Constructing World Class Tennis Courts

Bradley H. Young, 2010 STA Scholarship Recipient

In theory, a grass court can be any piece of flat grass that is large enough to have the proper dimensions on which to play tennis. However, this is not really the case. There are three main elements which make up any grass court – the turf, the soil and the base – and only when all three are in synergy can a proper patch of land be called a grass court.

QUOTABLE QUOTE

"A grass court's playing characteristics (such as the height, speed and trueness of the ball bounce), as well as its durability, depend on the quality of a court's component parts and the skill of the grounds staff in looking after it."[1]

The first step in having a proper grass court is solid construction, where building a good base is the key. Most grass tennis courts are constructed similar to USGA greens. There are specific recommendations that should be followed when constructing a court and the cross-section drawing of a tennis court looks very similar to that of a USGA green. The following construction procedure was carried out at The All England Lawn Tennis and Croquet Club, home of the Wimbledon Tennis Championships.

Construction of a court will vary from site to site based on the type of sub soil present. The first step for any construction project is to do your locates. Before any excavation can begin, a land survey must be done in order to find out where any underground utilities such as water, hydro or phone lines are so that when excavation is done, all utilities can be avoided. Once the survey has been completed, excavation can begin. The ground is excavated to a depth of 18", with an additional trench dug into that for the drainage lines. The drainage lines can be laid in one of two ways, herringbone or grid. Figure 1[2] shows examples of both.

The courts at Wimbledon use the grid system of drainage, where the main 4" line runs down one side of the court and the lateral 3" lines run almost perpendicular to the main line at a slope of 1% so the water will continue to flow. The drainage tile is perforated to allow water to enter.

Once the drainage has been laid, then construction on the drainage layer can begin. This is the first layer that goes in over top of the drainage tiles. The drainage layer is usually made up of washed (dust-free) hard stone between 5/16" and 3/8" that won't crush when compacted. It is comprised of aggregates that are angular so they lock together and compact well while remaining well draining. This layer is approximately 6" thick, but can be thicker depending on site conditions and the sub-soil underneath. The drainage layer is the foundation of the court and one of the key elements in maintaining a successful grass tennis court.

Once the foundation or base has been laid, the next layer to be installed is the

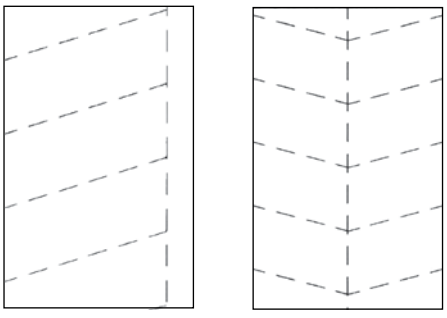


Figure 1. Alternative drainage systems. A grid system is on the left and a herringbone is pictured on the right.

binding layer, similar to a binding layer in a USGA green. This binding layer brings together the base and the topsoil, while preventing the topsoil from moving down into the base. The binding layer is made up of coarse sand and compacted – again to prevent the topsoil layer from penetrating to the foundation. This layer is usually about 2" thick, and although it is made of compacted sand, it is still very porous and allows for water filtration. Careful consideration should be made when choosing the type of sand for this binding layer. It should be lime-free to prevent altering the pH of the topsoil above it.

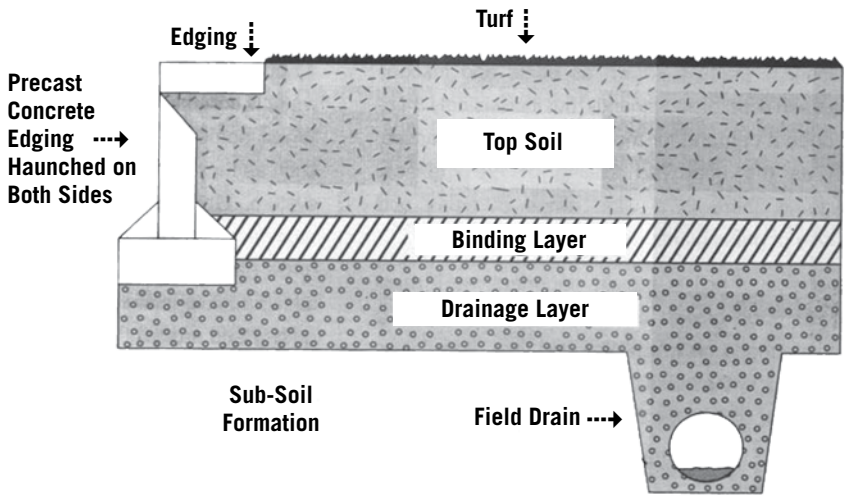
The final layer is the second of the three important elements of a grass court, the topsoil. This layer is usually the thickest of the layers at approximately 10". A soil should be chosen that will be the best possible for grass growth and also compacts well allowing for a firm playing surface. Ideally, the topsoil will contain around 5% organic matter. The courts at Wimbledon contain up to 20% clay in the topsoil to allow for consistency across the courts and firmness. The topsoil layer is laid in 2" lifts, raked, and compacted twice to remain consistent throughout. Installing this layer can be a time consuming and labour intensive procedure.

The edging of a court is made up of concrete with drains on either side to allow for the surface water to run off into a drain. Figure 2[3] shows a typical cross-section of a grass court.

The final portion of building a grass court is of course the grass. There are many species to choose from: creeping bentgrass, annual bluegrass, fine fescues, perennial ryegrass, etc. Some tennis facilities use a mixture of perennial ryegrass and fine fescue; in fact Wimbledon did that up until 2001 at which time they switched to a mixture of different perennial ryegrass cultivars. They made the switch to 100% perennial ryegrass because of its durability and wear tolerance.

"Independent expert research from The Sports Turf Research Institute in Yorkshire, UK, proved that changing the grass seed mix to 100% perennial ryegrass (previously 70% rye/30% creeping red fescue) would be the best way forward to combat wear and enhance court presentation and performance without affecting the perceived speed of the court."[4]

Figure 2. Typical cross-section of a court.



Establishing Grass

There are two obvious options for establishing grass on a new court, sodding and seeding, and there are advantages and disadvantages to both. Sod will create an instant court look, however will still take a while to grow before it can be played on. Sod can be cut and rolled sooner than a seeded court, and will be ready for play a lot faster. However, when laying sod one must ensure the soil that is on the sod is the same as the topsoil on the court. Otherwise, layering will be created, and the court will not drain properly. Also, if sod is not laid properly, it can create bumps and an uneven playing surface.

Seed on the other hand, will create a much more uniform playing surface, use the existing soil as its soil base, and will therefore not create a new layer, allowing for proper drainage. The major downside to seed is that it takes up to one year to establish fully before there can be play on the courts. Wimbledon, despite the amount of time it takes to establish fully, seeds rather than sods all of its courts.

Maintaining A Grass Court

Once the grass on the court has been established, it is up to the ground staff to maintain the high level of quality and playability that is expected at Wimbledon. There is maintenance work done on the courts through three of the four seasons, winter being the only one where little to no work is done. There are, however, growing lights installed on Centre Court at Wimbledon to keep the grass growing throughout the winter months. The grass court playing season usually begins in mid-late May and carries on through to the end of September.

The grass courts at Wimbledon are among the best in the world. The ground staff work tirelessly to ensure that the courts are of the highest quality and performance. For two weeks out of the year, they are beaten and bruised, but have proven to stand the tests of time and competition. I am proud to say that I am among those people working hard to maintain such a high expectation.

References

1, 2 & 3. www.lta.org.uk/Resources/Clubs/Grass%20Courts.pdf
4. www.wimbledon.org/en_GB/about/infosheets/grasscourts_general.html

EDITOR'S NOTE

The cross section of the Wimbledon court corresponds very closely with the specifications for a Class 2 athletic field as described in the STA's Athletic Field Construction Manual. A Class 2 rating is due to the inclusion of 20% clay in the top soil mix.

Industry News

EFFECTS OF CULTURAL PRACTICES ON EXISTING SCHOOL FIELDS

Dol Turf Spearheads Field Research

BOND HEAD, ON. The Simcoe County District School Board, with trial partners Dol Turf Restoration, DCS Agronomics, Sports Turf International, Agrium and Vanden Bussche Irrigation, have begun a two year study on the effects of specific cultural practices and slow release nitrogen products on two existing high school sportsfields.

Dol Turf
RESTORATION | CONSTRUCTION | MANAGEMENT

High school fields take a tremendous, season-long pounding, and with limited budgets school boards have a difficult challenge maintaining safe and playable sports fields. With the help of Dol Turf Restoration and DCS Agronomics, a series of trials using different aeration methods and fertility regimes will be applied to a brand new field (engineered by MMM Group) as well as an older, more established field. All of the field work is being supplied by Dol Turf Restoration, with base line and data analysis by Dave Smith of DCS Agronomics.

The results will be monitored and tracked by state-of-the-art GPS mapping and plant health monitoring systems as well as through visual evaluations. Water usage will be tracked using both weather station and field sensor techniques, with the equipment supplied by Vanden Bussche Irrigation.

Fertility is a critical component to maintaining healthy turf under intense pressure. Several different slow release nitrogen products will be monitored for longevity, turf health and aggressiveness. Agrium is supplying several different nitrogen products for the trials.

Over a two year period, different aeration methods such as deep tining, traditional coring, shattertine and solid tine treatments will be used on randomized, three replication plots. Demonstration areas have also been set up to show the effects of practices such as verticutting and organic amendments.

The end goal is to identify the most effective methods and product applications for a school field environment, which will aid the Simcoe Board to develop the best sports field maintenance specifications for their schools. It is anticipated that results will be presented in 2012. For further information, contact Ken Pavely (kpavely@dolturf.com) or Gord Dol (gdol@dolturf.com) at Dol Turf Restoration, 1-800-794-9664. Visit them online at www.dolturf.com.

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