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Using Organic Herbicides on School Grounds

By Jenny Kao-Kniffin, Ph.D.

14th Annual Sullivan County Challenge - Steve Smith Memorial Tournament

August 21, 2013
 Grossinger Resort,
 Liberty, NY

Central New York Golf Course

Superintendents Association Poa Annual Golf Tournament

August 26, 2013
 Lake Shore Yacht &
 Country Club, Cicero,
 NY

Adirondack Golf Course

Superintendents Association Poa Annual Golf Tournament

September 10, 2013
 Top of the World Golf
 Resort, Lake George,
 NY

Northeastern Golf Course

Superintendents Association Poa Annual Golf Tournament

September 16, 2013
 Country Club of Troy,

Several new organic herbicides are being marketed in the U.S. for the lawn care industry. The efficacy of these organic herbicides varies by product, as a result of differences in the ingredients of herbicide formulations. With the passage of the NYS 2010 Child Safe Playing Fields Law (CSPFL), most herbicides are now banned from use on playing fields and playgrounds in all NYS schools and daycare centers both public and private. Several products are allowable for use without approval by the school board, but the herbicides are primarily non-selective and will injure all vegetation.

Weed scientists from the Long Island Horticultural Research & Extension Center (LIHREC) and Cornell Turfgrass recently evaluated several minimum and reduced risk herbicides for use on turfgrass. The allowable herbicides tested include Weed Zap (clove and cinnamon oil, 85%), GreenMatchEX (lemongrass oil, 50%), and Burnout II (clove oil and citric acid, 48%). They contain active ingredients that are exempt under the Federal Insecticide, Fungicide, & Rodenticide Act (FIFRA) 25(b) minimum risk pesticides, and all inert ingredients are listed under 4a. We also evaluated two new reduced risk herbicides with softer chemistries, Fiesta (iron HEDTA, 27%) and Ecosense Weed B Gone (iron HEDTA, RTU), that are not permitted on NYS school grounds unless the school board approves its use. The same approval process is required for conventional herbicides containing glyphosate, 2,4-D, or other common active ingredients.

Of the three allowable herbicides, Burnout II showed the greatest suppression of total vegetation (weeds and turfgrass). All of the allowable herbicides showed injury to both weeds and turfgrass. Regrowth of perennial turfgrasses and weeds occurred after the first application, but annual weeds could be effectively removed with the herbicides. The reduced risk (chelated iron) herbicides were selective in causing injury primarily to broadleaf weeds, while grasses showed a deep green discoloration that was superficial. The 'greening' of the grass can be removed through mowing and subsequent grass regrowth. After the second application, the chelated iron herbicides showed high suppression of clover, mugwort and plantain weeds, while the percent cover of turfgrass was the highest of all herbicides used.

Although all of the herbicides evaluated showed some level of vegetation control, the chelated iron products were the only selective herbicides that minimized injury to turf. The iron-based herbicides need approval by the school board for use on NYS school grounds, but the softer chemistry and

Troy, NY

Metropolitan Golf Course Superintendents Association and Hudson Valley Golf Course Superintendents Association Poa Annual Golf Tournament

September 17, 2013
Spookrock Golf Course, Suffern, NY

Winning Fields, Winning Fairways

October 1, 2013
Bethpage State Park and SUNY Farmingdale, Farmingdale, NY

Hahn Memorial Scholarship Golf Tournament

October 7, 2013

Turf & Grounds Exposition

November 12-14, 2013
Rochester Riverside Convention Center, Rochester, NY

reduced risk status are likely to be approved quickly and more routinely by most school boards. All of the herbicides show limitation in their cost effectiveness when compared to the less expensive 2,4-D and glyphosate-based herbicides. Prior to the enactment of the CSPFL, glyphosate-based formulations were the most common herbicides used on school grounds for non-selective vegetation control at fence lines, baseball fields, and playgrounds. Glyphosate products were routinely used for playing field renovations. The organic herbicides examined in the study range from \$16 to \$115 per 1,000 sq. ft. of application. The best performing organic herbicide in the study (Burnout II) was at the lower price range. In comparison, the glyphosate-based herbicides typically cost a mere \$12 for the same area of coverage. While no CSPFL allowable herbicides are selective in controlling broadleaf weeds, the chelated iron herbicides provided an acceptable level of control that may be unaffordable to most school districts. Prior to the CSPFL, the 2,4-D-based herbicides were used to control dandelions, plantains, and other common broadleaf weeds within established turf. The 2,4-D products cost \$14 to treat 1,000 sq. ft., while Fiesta (iron-based herbicide) is \$39 for the same area of turf.

Organic herbicides and the chelated iron products may appeal to the school districts with larger budgets, but most superintendents will find that reliance on organic chemical control is not a viable option for routine grounds maintenance. The intent of the CSPF law was to encourage the adoption of good cultural management strategies for turf that do not rely on herbicides. However, good cultural management of turf utilizes chemical control as a last option. The CSPFL eliminates that final option unless the school board is convinced otherwise in a case-by-case basis involving emergency applications.

Until more effective organic herbicides are available at an affordable cost, school grounds management in NYS will need to adopt non-chemical weed control options. Repetitively seeding playing fields in late summer and early fall with perennial ryegrass will help maintain high turf density that can suppress the germination of weed seeds. The cost of perennial ryegrass seed is typically \$20 for a 10lb per 1,000 sq. ft. seed application. An alternative weed control strategy developed by Frank Rossi is based on scalping and seeding. The turf is mowed at the lowest setting and fine fescues are seeded in. Many fine fescue varieties (including Intrigue II and Columbra II) produce an allelopathic compound in the roots that prevents weeds from establishing. The scalping and seeding method provided greater weed suppression compared to using Roundup (glyphosate-based) herbicide.

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