

forward of vertical. The nozzle tips were no more than 0.5 inches off the ground. The technology used in the research units is available on commercial units with up to 1,000-gallon tanks with 16-foot booms.

This unit was used to apply field trials testing control of mole crickets. Many of those trials were conducted under the direction of Dr. Pat Cobb at Auburn University in Alabama.

Preliminary indications were that the technique had tremendous potential and had many advantages over a conventional surface application. Environmentally, the surface exposure to pesticides was reduced considerably. One study on warm-season grasses showed that surface residues were reduced up to 90 percent. In addition, there was virtually no drift during the application because the nozzles rode so close to the ground. In certain circumstances, the rate of application could be reduced 50 percent using HPLI and still provide the same level of control as a conventional application at the full rate.

There is at least one other kind of high pressure liquid injection equipment currently available. Like the equipment used for our trials, it does not slice the turf. This unit, available on a contract basis in parts of the Northeast, uses a computer-driven micro-plus system. The depth of penetration into the turf can be set by adjusting the length of each micro-pulse, the pressure, and/or the ground speed. The unit seems to be the "second generation" of HPLI and has lots of application possibilities.

Some golf course superintendents may be thinking that the Toro HydroJect unit might be used to deliver liquid insecticides below the surface. In fact, the HydroJect was not built for the purpose of applying pesticides, so the seals and delivery systems are not designed to handle pesticides. In addition, the purpose of the HydroJect is to shatter the soil structure using even higher pressures than the systems so far described.

Studies conducted by Dr. Harry Niemczyk at Ohio State University indicate that placing insecticides *below* the point where grubs are active is just as ineffective as not moving them down from a surface application. Placing materials as little as an inch below the thatch-soil interface results in their failure to perform.

Turf Slicing Systems

Another approach to subsurface placement of pesticides involves slicing the turf in a manner similar to an overseeder, and dropping the material into the slice. There are several companies working on variations of this theme, including large tractor-driven units and smaller walk-behind units.

In each case, the concept is the same—slices are cut in the turf, tubes deliver pesticides (through gravity feed) into the slice, and a plate "tucks in" the turf around the slice.

There are at least two obvious advantages to such a system. First, there is no high pressure system with the inherent dangers of blown lines. Perhaps even more importantly, you can set the application depth very accurately—often within 1/8-inch. As a result, you can adjust the unit to handle the conditions of each given turf area.

Slicing units can deliver pesticides to areas with thick (more than one inch) thatch just as effectively as to areas with less thatch. The main drawback so far is that the slicing process does pull out a lot of thatch. In a large operation, this "hay" must be disposed of to prevent the machine from clogging. Some of these units have liquid adapters so that they can be used to apply liquid formulations into the slices.

The technology of sub-surface placement of pesticides has expanded tremendously in the past couple years. It appears that the technique reduces surface exposure tremendously.

Environmental Concerns

Drift risk is reduced considerably with the HPLI technique. As a result, turf managers could make applications during mildly windy conditions when conventional applications would not be an option. In addition, subsurface application techniques *may* provide applicators with a longer window during which they can apply post-application water. Results of some of our trials suggest delays in post-application watering are less crucial in subsurface applications than in conventional.

Subsurface placement of pesticides is a technology whose time has come, particularly in areas of the country where environmental concerns are paramount. □

Dr. Patricia J. Vittum is with the University of Massachusetts, Department of Entomology, Amherst, MA. The above article was reprinted from Cornell University Turfgrass Times.

ROOKIES

PRODUCT UPDATE

FERTILIZER COATING

Poly-S technology, developed by the O.M. Scott & Sons Company, was created combining a proprietary polymer coating and a sulfur coating to provide controlled-released turf fertilizers with residual programmed from two to six months.

Technological advantages include: no dust and decreased build-up on equipment; increased slow-release values and resistance to environmental/temperature stress; uniform release, reduced surge growth, and low phytotoxicity; and a source of nutrients for turf with extended release.

THE O.M. SCOTT & SONS COMPANY

Circle 121 on Postage Free Card

RIDING MOWER

The Greensmaster 3100 riding mower has a hydraulic oil leak detector to safeguard against spills. The "Turf Guardian" detects leaks as small as five ounces and alerts the operator to move the mower off the course in the event of a leak.

Other features include a single-lever, quick-adjust steering arm designed to accommodate different sized operators and their steering styles. The mower is powered by a 16-horsepower Vanguard V-Twin commercial-grade engine.

THE TORO COMPANY

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SHORELINE STABILIZATION SYSTEM

Armater "S" is a three-dimensional, semi-rigid, stitched seam geocell with a honeycomb design. It is a stabilizer for steep slopes, and other areas where natural or mechanically reinforced vegetation is scarce or unavailable.

Armater "S" panels cover a 179-square-yard area. The panels are constructed of nonwoven polyester fabric strips that are permeable, lightweight, and rot-proof.

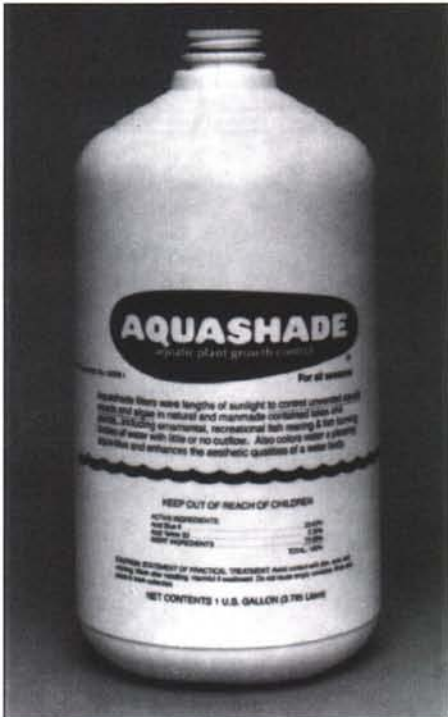
AKZO INDUSTRIAL SYSTEMS COMPANY

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ROOKIES

PRODUCT UPDATE

AQUATIC ALGAE AND WEED CONTROL



Adding concentrated Aquashade to lakes and ponds controls algae and weeds by cutting off sunlight they need for growth. Adding it to contained ponds or lakes will turn them a blue or aqua color. Wind and water currents disperse the liquid throughout the body of water.

Aquashade will not harm people, fish, wildlife or turf, and treated waters may be used for swimming or irrigation.

AQUASHADE INC.

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SPRINKLER NOZZLE

The High Uniformity sprinkler nozzles from FCI have a water application savings of 40 percent. Other benefits include an even application of fertilizer and reduced energy costs.

The nozzles are available for use in most models of impact-type sprinklers.

FULL COVERAGE IRRIGATION

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TURF CUTTER

The Pro Lite Turf Cutter supersedes the Model "A" turf cutter and weighs only 170 pounds. A depth adjustment has been added, making thickness of cut variable to 1-1/2-inches. Drive wheels make it possible to replace a worn or damaged tire without replacing the whole wheel.

The Pro Lite is available with either a Briggs & Stratton I/C or a Honda engine.

TURFCO MFG., INC.

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STRIPING PAINT

Quick Stripe aerosol marking paint maintains its brightness and sharp lines throughout heavy competition. It ensures accurate spotting of field position for players, coaches and officials, and dries quickly, limiting field delays.

Quick Stripe does not harm grass or retard growth and the cans empty completely to eliminate waste. It will stripe 2,000 to 4,500 linear feet per case. Colors include arctic white, athletic orange, blue, red, and yellow-gold.

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