Cutting-Edge Application Technologies

by Jim Puhalla

New technologies that are being referred to as injection methods have emerged for applying chemical agents to sports turf. These technologies include fertigation, hydro-jet injection, and drill seeders that drop solid material into slits.

Many of the new methods have produced positive results in field applications. The biggest hurdles to their widespread use are probably price and lack of knowledge on the part of fields managers. Let's try to remedy that knowledge gap.

Fertigation systems

Fertigation applies fertilizer or other liquid soil-enhancement products through an installed irrigation system. Chemical agents are automatically mixed into irrigation water from one or two reservoirs within the system.

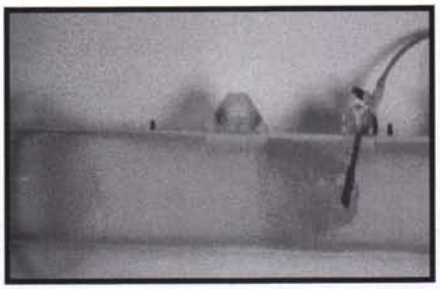
Some early fertigation systems have been abandoned because of clogging problems. Of course, liquid fertilizer tends to clog traditional spray equipment as well. These problems have not stopped companies from developing new generations of equipment.

Products that can be applied through a fertigation system include wetting agents, root enhancement products, and water treatment products that lower the pH of alkaline city water.

Fertigation equipment can add $3,000 to $7,000 to the cost of an installed irrigation system. However, according to David Hineline of North Coast Distributing, a fertigation system can save sports turf managers about 1/3 to 1/2 the cost of quality granular fertilizer.

Fertigation savings also show up in labor costs. A fertigation system obviously requires less labor than applying granular fertilizers with a spreader.

Labor savings can be especially significant on sand-based fields. The ideal fertilization schedule for a sand-based field is spoon-feeding: frequently applying small amounts of fertilizer. A fertigation system is ideal for this type of schedule.



The Toro NutriFlow Fertigation system uses an injector quill to distribute nutrients evenly into the lines of an installed irrigation system.
Courtesy: Toro

Fertigation systems are more cost-effective for large complexes than for smaller facilities with only one or two fields. Smaller operations may not recoup the cost quickly enough to justify the initial investment.

Of course, a fertigation system is only as good as the distribution uniformity of your irrigation system. If the system irrigates unevenly, fertilizer applications will also be uneven.

Hydro-injection

Another type of equipment called hydro-injection systems can be used for applying pesticides.

Hydro-injection uses a fine, high-pressure water jet to make a hole, and then injects material from a holding tank or bin through the turf canopy into the soil. The equipment can inject both liquid and solid products with minimal surface disruption. Most sports field applications can be ready for instant use.

Calibration is somewhat harder with dry material. Depth of penetration and the machine's ground speed must be considered. Calibration for liquids is easier, using gallons per 1,000 square feet as with a traditional sprayer.

Hydro-injection systems can also be used to aerate or inject sand and/or conditioner into turf. It is now being successfully used in Australia to inject fungicide.

These systems can cost upwards of $16,000, so most users in the near future will be hiring an outside contractor to provide the treatment.

Some manufacturers are now developing devices that will convert existing sprayers to injection-type units. These products promise a more affordable system.

Slitting injection

Another type of system uses stationary blades to cut slits in the turf. Behind each blade is a nozzle which sprays a stream of liquid into the slit. This technique is promising, but currently available models are very expensive.

A similar technology uses the same principles, but at a lower cost. It uses a drill seeder to drop solid material into soil slits through tubes. A roller then closes the openings. The typical cost of these units ranges from $4,000 to $5,000.

The University of Florida has performed extensive research on the use of this technology to control mole crickets, and has reported good results. The technology seems promising for grub control as well.

Technologies designed to deliver materials directly to the rootzone are showing substantial promise in early applications.

The initial cost of fertigation systems is probably most easily justified in large facilities. Slitting Injection equipment has the most immediate pay-back where widespread root-zone pest problems occur. Hydro-Injection technology allows frequent conditioning and treatment where surface disruption would be a problem.

All of these technologies require a major investment, but continuing research and development by industry manufacturers is bringing them within the grasp of more and more fields managers. ❑

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1 Dallas Morning News, August 3, 1997.