

Corn by-product works against crabgrass

Dr. Nick Christians at Iowa State says marketing talks under way for products containing corn gluten meal.

■ Surface applications of corn gluten meal can control crabgrass, reported Dr. N.E. Christians at the International Turfgrass Conference this past July.

Gluten is a protein substance extracted from some milled grains. The gold-colored powder is popular for use as an animal feed.

"Laboratory and field studies indicate that this material has the potential of being used as a natural 'weed and feed' product to inhibit the establishment of germinating weeds in mature turf stands," said the Iowa State University researcher.

"There is an inhibitory substance in this corn by-product," explained Christians, "that acts as a growth regulator to prevent

root formation of germinating plants.

"When drying occurs, the plant dies. A drying period is required for weed control. If the treated area remains excessively wet during the germination period, control is reduced."

According to Christians, timing of applications plays a big part in the effectiveness of the material's use as a pre-emergent. If the material is applied too early or too late, weed control is reduced.

The researcher commented that the material can provide nearly complete control of crabgrass in Kentucky bluegrass, but at rates above what a turfgrass manager would probably want to use. However, a level of 2 lbs. N per 1000 sq. ft. can provide 58 percent reduction in crabgrass establishment, he says. This is practical in a spring application because the corn gluten meal also contains approximately 10% nitrogen (N) by weight, making it a good natural fertilizer for turf.

"For plants with fully developed root

systems, the material acts as a natural, organic nitrogen source with N release characteristics similar to other commercially available organic N sources," said Christians.

Christians was issued a patent in July 1991 to use corn gluten meal as a pre-emergence herbicide when applied to the soil surface. Marketing agreements are reportedly under negotiation.

Further tests will determine the spectrum of weeds controlled by corn gluten meal, and whether it can be used on other crops.



Christians: Timing is key with gluten meal.

—Ron Hall



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Cornell research covers natural/organic bases

Tests suggest chemicals and biologicals may be used together for insect control.

ITHACA, N.Y.—Cornell University researchers who have intensified their biological and organic turf care tests report positive findings from projects begun in 1992.

While some tests suggest biological controls may outperform chemicals in some instances, they also offer hope that chemicals and alternative products can be used in tandem for turf care.

Preliminary studies show that combinations of fungal pathogens and traditional insecticides might increase grub mortality.

Insect control. In tests using biologically based control agents for scarab grub control in turfgrass, 14 isolates—fungal pathogens of soil insects—were tested against Japanese beetle grubs.

According to Dr. Michael Villani, of the Geneva, N.Y. experiment station, two of the isolates are currently being considered for commercial use. The other 12 were chosen because they were taken from scarab grubs around the world.

Villani reports that some isolates were more dependable than others throughout the course of the study, due to a variety of environmental conditions found in city



Villani: Soil temperature and moisture important.

golf courses, mostly combinations of soil temperature and moisture.

"Fungal pathogens don't like free water," says Villani, "and the spores don't survive as well, and don't adhere to the grub as it moves through the soil."

Preliminary studies also showed that combinations of fungal pathogens and traditional insecticides might increase grub mortality and reduce the lag time common for many insecticides in soil.

Villani reports that fungal pathogens were added to composts used for top dressing greens, with encouraging results. Testing in this area continues.

Ideal conditions. As with any chemical control products, environmental conditions must be suited for maximum biological insect control. Villani's studies suggest that under certain environmental conditions—primarily related to soil moisture and temperature—commercially available entomopathic nematodes may outperform standard turfgrass insecticides for grub control.

Disease control. Plant pathologists Dr. Eric Nelson and Cheryl Craft are currently studying biological control strategies with compost-based organic fertilizers. According to Nelson, research conducted in 1992 centered on evaluating composts in the field for disease suppression, developing laboratory assays to assess microbial activity and biomass and recover isolates of bacteria, fungi and actinomycetes from suppressive composts.

Nelson says data was collected for the suppression of dollar spot with various composts. Snow mold suppression tests are ongoing.

"We hope to understand how disease-suppressive properties of composts might be predicted," says Nelson.

Organic greens. "As peat becomes more difficult to mine, alternative organic sources will likely become common in putting green rootzone mixes," says Dr. Norm Hummel of the university's floriculture and ornamental horticulture

departments.

Hummel, Nelson and research associate Mary Thurn made a two-year evaluation of four organic sources in sand-based rootzones for disease suppression, physical stability, and nitrogen mineralization.



Hummel: Composts may work in golf course greens.

In this experiment, they tried to determine the effect of compost on Pythium root rot and the impact of phosphorus on disease severity.

In field trials, a municipal sewage sludge compost, a brewery waste compost and reed sedge peat provided significantly better disease control than either the sand control or a seaweed product. Control was generally better than 80 percent.

In another study, physical properties of laboratory-packed samples were compared to undisturbed field cores taken one after establishment, to determine if measurements taken on laboratory-packed samples could be used to predict physical properties in the field.

Test results suggest that composts may be useful as organic amendments for sand-based rootzones.



Nelson: Compost extracts suppress Pythium spp.

For more details of the Cornell research, contact Dr. Hummel, 20 Plant Science Building, Cornell University, Ithaca, NY 14853.

PRODUCTS

EPA approves biopesticide for use on turf, ornamentals

MVP biopesticide from Mycogen Corporation has been given a green light from the Environmental Protection Agency and the California EPA for a number of turf and ornamental uses.

MVP is an encapsulated bioinsecticide based on *Bacillus thuringiensis* (Bt).

The product's patented CellCap encapsulation improves residual activity and field performance, according to Mycogen.

Craig Laursen, specialty marketing product manager, says CellCap insecticides remain active in the field three to five

times longer than traditional Bt products. With the CellCap system, dead bacterial cells serve as biological microcapsules—or "biopackages"—which protect the fragile, insecticidal proteins from environmental degradation.

The CellCap system combines positive features from different naturally-occurring organisms. The biopackage component consists of the cell wall of *Pseudomonas fluorescens*, a non-pathogenic bacterium which is naturally found in soil, water and on plant surfaces. MVP is now approved for use on bedding plants, flowers, ornamentals, turf, shade trees and nursery trees.

Labeled pests include armyworm, buck-moth caterpillars, cabbage loopers, diamondback moths, fall armyworms, fruit tree leafrollers, loopers, omnivorous leafrollers, tent caterpillars, tobacco budworms and tortixes.

MVP is most effective against caterpillar larva in the first and second molting stages.

According to Mycogen, MVP is harmless to beneficial insects, including biocontrol predators. The product has minimal re-entry restrictions.

MVP can be used alone or in a tank mix.

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Organic soil additives custom-made for golf, athletic fields

North Woods Organics of Waupaca, Wisc., now offers sphagnum, reed-sedge, hypnum and top moss for use as soil amendments.

According to the company, these organic peats are ideal for use as components in root zone mixes, for golf course greens and tees and athletic playing fields.

Reported benefits include faster maturation of turfgrass, faster recovery from traffic and optimum water holding capacity and better disease resistance.

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New book explains dynamics of natural soil systems

Edaphos is a new book by Paul D. Sachs that explains the detailed inter-relationships between the soil and the earth's environment.

In "Edaphos," Sachs explains the reasons why the author believes mankind is critically linked to the ecosystem.

According to Sachs, the future of civilization is determined by our reverence or apathy for the soil.

The book answers questions that growers, gardeners and extension specialists always ask, according to Karen Idoine, extension specialist at the University of Massachusetts.

To order or obtain more information, call (802) 222-4277

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Video explains right way to compost, build recycle centers

A new video entitled *Composting: A Recipe for Success*, is available from Compost Productions, at International Marketing Exchange, Inc., McHenry, Ill.

The video is hosted by Cort Sinnes, a syndicated columnist and former editor of *Flower & Garden Magazine*.



Included are tips for building backyard recycling centers to help homeowners take advantage of the opportunities to convert the many household products that can be collected and recycled.

Cost is \$14.95, plus \$3 for shipping charges. Quantity pricing is available.

To order or obtain more information, call (815) 363-0909.

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EVENTS

OCTOBER 18-21: Biological controls as viable methods of pest management is the subject of a turf conference to be held in Madison, Wisc.

The conference will include useful information on identification and control of beneficial predators in pest control.

With the expansion of biocontrols from agriculture to turf care, the conference is open to forest managers, greenhouse and nurserymen, extension agents and landscape contractors as well as farm industry personnel.

Dan Mahr, entomologist at the University of Wisconsin Madison says predator pest control has been used for more than 100 years, but has been less popular than chemical control products.

●Participants will learn the basics of biological control; insects and mites as pests; the importance of natural control; beneficial natural enemies and approaches to biological control.

●Methods of biological control, such as releasing beneficial natural enemies and encouraging those that occur naturally, will be discussed.

●A crop protection seminar covers biological control for alfalfa, corn, crucifers, vegetables, fruit crops, forests, stored products and nursery and landscape plantings.

For more information, contact Lee Gottschalk at (608) 263-1672.

BIOTURF NEWS

Bio-Turf News: For the latest in organic, biological and natural landscape care

Bio-Turf News is our bi-monthly department on current research and development in biological, organic and natural turf care.

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to show results. Others believe customers should have a choice. And still others are probably wondering what all the excitement's about.

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IRON from page 26

plementation where iron chlorosis or plant yellowing occurs, a condition common to calcareous or alkaline soils (pH 7.0 or higher), as well as sandy soils. Today, however, most professionals applying iron are after cosmetic results rather than preventing or correcting chlorosis.

Iron can be used to make the turf (and the turf manager) look good.

Most soils contain abundant supplies of iron, but due to its limited solubility, this trace element is seldom taken up in sufficient quantities to meet the demands of high-grade ornamental turf.

Research has shown that, in addition to the effect of soil types and pH levels, iron uptake can be reduced by:

- cool soil temperatures,
- excessive moisture,
- micronutrient imbalances and
- high soil phosphate levels.

Heavy metals or high levels of nitrate nitrogen can also cause iron to become "locked up" and thus unavailable to the plant.

Supplemental iron has been available for years in many of the better grades of granular nitrogen/potassium/phosphorus fertilizers. Iron applied to the soil, however, rapidly reverts to a ferric state which is not available for plant absorption unless it is chelated. Unchelated soil-active products can get tied up with other soil minerals, decreasing the iron's solubility. And ferrous sulfate or ferrous ammonium sulfate iron in granular form must be watered in to prevent burning.

Chelated iron products, available in both dry and liquid forms, are formulated to hold iron in an available form for a more extended period of time. A chelating agent such as EDTA causes the iron to lose ionic characteristics and protects the micronutrient from soil reactions. This allows chelates to be used at lower rates and with reduced burn potential.

But chelated products are also generally more expensive to use than other irons, and may be slower in producing a visible color change. Thus, in recent years, sprayable iron sulfate products that are absorbed through the foliage have seen the most growth in the green industry.

Research has shown that foliar applications are significantly more effective and efficient. Foliar-active products not only provide a greater amount of plant-available iron, but they are taken in by the leaves, where the chlorophyll is produced.

Turf desiccation: winter's lasting gift

The biggest culprit is intense cold wind at times of low humidity. Disease comes along later.

■ Winter brings with it more than just colds and flu, mom. It can also beat up the turf until there's no turf left. They call it desiccation, and it's a lousy way to start the spring.

Turf desiccation—a.k.a. winter kill—comes in two forms: atmospheric and soil desiccation.

Atmospheric desiccation is caused by the general drier environment, accompanied by stinging wind and low humidity. The soil is unable to absorb water at lower temperatures, too, which adds to turf frailty.

Soil desiccation results in white leaves, but the leaves are more limp.

With an all-out temperature kill, turf leaves appear to be water-logged. They take on a whitish-brown color, and eventually turn dark brown. The leaves are limp and matted, and you may detect a moldy odor. This type of kill occurs when the soil temperature plummets quickly.

Look for it during late winter freeze-thaw periods.

Dr. Jack Hall of Virginia Polytechnic Institute says desiccation can occur on

sand-modified soil where there's limited moisture in the soil profile.

As Hall explains, winter desiccation is basically a function of available moisture and the extent to which the root system can absorb and store that moisture.

"Our best approach is sound management," advises Hall, "and fertilize in late fall to maximize root development."

"Our winter rainfall is generally adequate," says Hall. "The last time we lost bermudagrass to winter desiccation was in 1980-81. We had a greater kill on overseeded bermudagrass than in that which was not overseeded. The living overseeded grass continued draw down moisture."

Sodium content may cause problems. "Any time you have salt concentration in water, availability of water to plant is lessened," says Hall. "If you go into winter with high salt, unavailability of moisture is more of a problem."

● Younger turf is more susceptible to desiccation.

● Protect turf with heavier dose of top-dressing. Fabric may also work.

● Anything that promotes general plant health will reduce the threat of desiccation.

—Terry McIver

Winter brings disease

■ Snow mold invades in early spring, and lasts until June. Apply fungicide in early winter, ideally on the day before the first lasting snow.

Pink and gray snow mold occur when the temperature is just above freezing and accompanied by excess leaf moisture. The infected turf will turn flaccid and become dehydrated. Gray snow mold is differentiated by sclerotia imbedded in the leaves and crowns of the diseased plants. Look for large brown patches covered with a whitish fungal mycelium.

Cottony snow mold begins as yellow patches which become the color of straw. Look for gray mycelium on leaves.

Prepare turf for winter disease before it goes into winter with soft growth from excessive available nitrogen.

Cultural prevention—For pink snow mold: Avoid excess nitrogen in the fall. Prevent snow accumulation on highly maintained turf. Improve air movement by pruning trees and removing brush. Remove leaves in fall and winter. Rake or spike infected areas in spring. Remove thatch build-up.

Gray snow mold: Avoid early fall nitrogen fertilizer before the first snowfall. Avoid excess lime. Keep the thatch layer to a minimum.



Pink snow mold

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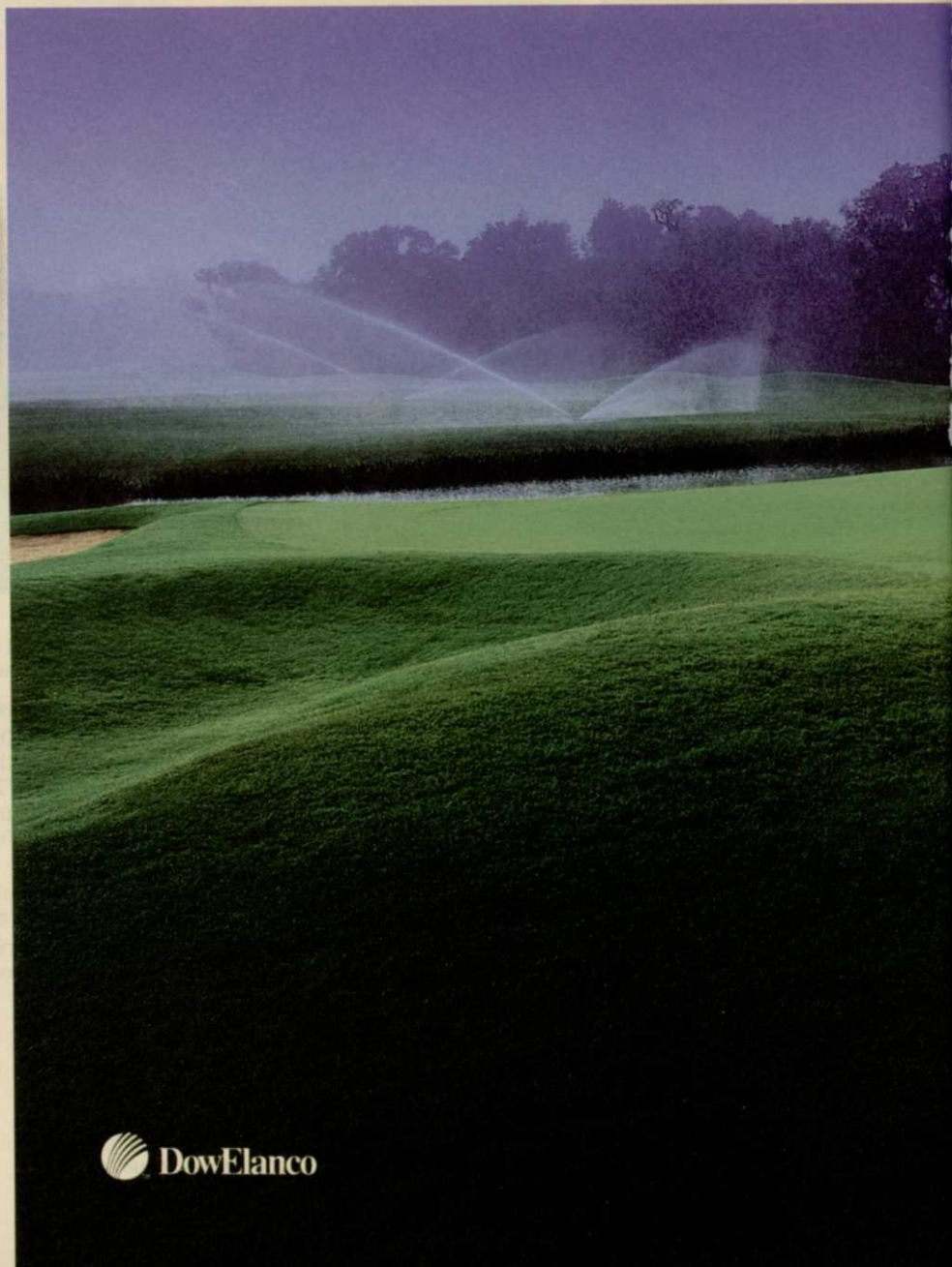
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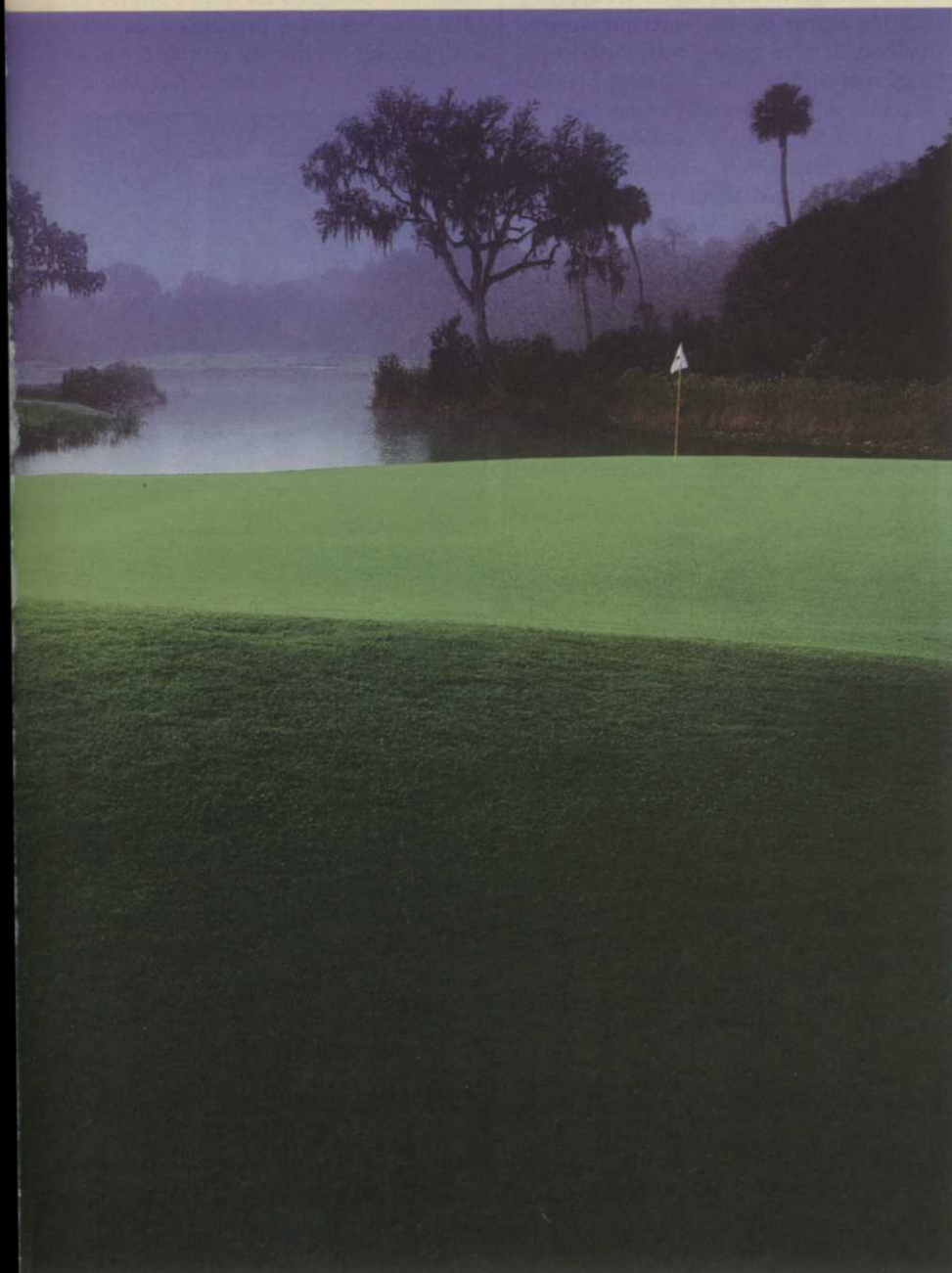
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GOLF 'SCAPING

Injecting wetting agents into greens soil

Toro, Kalo, Aquatrols innovations make it easier for superintendents to dry out wet greens.

■ Harold Edgerton was one of the first people to run liquid soil wetting agents through his water injection aerator to relieve stressed-out golf greens.

He began in mid-1992, shortly after the Toro Co. approved wetting agents for use with its HydroJect 3000, a practice proved by university research to provide faster green-up and improve turf appearance.

But Edgerton added one new "twist" to the technology: he found an effective metering system that uses a proportional injector attached just off-green, but on-line to the HydroJect. This eliminates using a spray tank mix which might introduce corrosion-causing residues. He found that, by connecting a non-electric self-priming Dosatron injector (11 gpm rate) to the HydroJect, he could assure accuracy even when water flow rates changed. Trial results last fall were so good that he's now adapted the system for golf courses which are served by his business, E&E Enterprises of St. Charles, Mo.

Incoming water drives the injector's piston. This action pulls the wetting agent into the mixing chamber and blends it with the water flow.

E&E Enterprises reports success using Hydro-Wet RTA ("ready-to-apply"), a Kalo product found by Michigan State University to deliver considerably more moisture with greater residual power in the rootzone.

RTA is recommended for HydroJect injection and for its Pro-Op, a hose-end applicator for syringing golf greens.

"In our closest areas around here, we will get an inch-and-a-half of rain, then suddenly the sun comes out to quickly 'cook' greens," Edgerton observes. To avoid damage, he adds, supers are applying wetting agents by this water-pressurized method. They're getting both faster penetration of surface water and longer residual action with less overall turf damage.

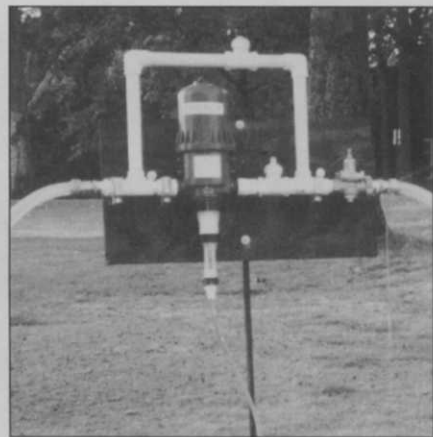
In the St. Louis area, Edgerton has used as many as five aerations per year, but he finds that three times with the HydroJect is ideal for many Midwest locations.

With many supers still coring in the spring and fall, Edgerton finds this injection service to be in greatest demand "in the

summer, when golf course activity is just too busy for traditional coring. Also, some surfaces of greens become too hard for conventional aeration to be truly effective."

Another innovation—This summer, Toro introduced the Injector Pro chemical injection spraying system developed by Hahn Inc. Designed for Toro's Multi-Pro 1100 Work Vehicle, it promises to do away with mixing chemicals with water in a

continued on page 42



Harold Edgerton has used a Dosatron/HydroJect hook-up for more accurate injection of wetting agents and to dry out wet golf greens. The Dosatron injector (inset) is self-priming. It pulls the wetting agent into the mixing chamber where it's accurately blended with water flow.

ELSEWHERE

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