# EVENTS

## AUGUST

**12-16: International Society of Arboriculture Annual Conference,** Sheraton Centre Exhibit Hall, Toronto, Ontario. Contact: ISA, 303 West University, Urbana, IL 61801; (217) 328-2032.

**12-16: Conserv '90** on water conservation, Phoenix (Ariz.) Civic Plaza. Contact: Conserv '90, 6375 Riverside Dr., Dublin, OH 43017; (614) 761-1711.

**12-17: Perennial Plant Symposium,** Hyatt Ravinia Hotel, Atlanta, Ga. Contact: Dr. Steven M. Still, Perennial Plant Association, 3383 Schirtzinger Rd. Hilliard, OH 43026; (614) 771-8431.

**14: Associated Green Industries of Northeastern Ohio Summer Field Day,** Roemer Nurseries, North Madison, Ohio. Contact: Associated Green Industries, (216) 572-2784.

**15-16: Texas A&M Field Day**. Contact: Bill Knoop or Milt Engelke, (214) 231-5362 or (214) 343-5011.

**15-16: Western Agricultural Chemicals Association:** "Involuntary Exposure, Cause for Concern?", Hyatt Regency Hotel, Sacramento, Calif. Contact: Jennifer Ryder-Fox, technical coordinator, (916) 446-9222.

**21: Golf Course Construction/Renovation and Golf Day,** State University of New York, Delhi, N.Y. Contact: New York State Turfgrass Association, (800) 873-8873; (518) 783-1229.

**23-25: Landscape Design Short Course for Residential Properties**. Contact: Conference Office, Box 8112, Georgia Southern College, Statesboro, GA 30460; (912) 681-5189.

**24-28: International Garden Centre Congress,** New York City. Contact: IGCC, c/o Garden Centers of America, 1250 I St. NW, Suite 500, Washington, DC 20005; (202) 789-1893.

## SEPTEMBER

**4-6: Midwest Agricultural Chemicals Assoc. Annual Meeting,** Pheasant Run, St. Charles, Ill. Contact: MACA, P.O. Box 2125, Northside Station, Sioux City, IA 51104-0125; (712) 277-7380.

**4-7: International Plant Propagators' Society Annual Meeting**, western region, Marriott Mission Valley Hotel, San Diego, Calif. Contact: (619) 692-3800.

**5-7: "Beginning in the Nursery Business."** Contact: Virginia Tech Continuing Education Program, (703) 231-5156.

**7-9: "Managing Urban and Suburban Trees Through Ordinances,"** Radisson Airport Hotel, Columbus, Ohio. Contact: American Society of Consulting Arborists, 700 Canterbury Rd., Clearwater, FL 34624; (813) 446-3356.

**10-11: Golf Course Development and Investment,** Oak Brook Hill Hotel and Resort, Oak Brook Hills, Ill. Contact: Institute for International Research, 437 Madison Ave., 23rd Floor, New York, NY 10022-7001; (212) 826-1260.

**12: "Developing and Implementing an In-House Maintenance Program."** Contact: *In-site* newsletter, 24380 N. Highway 45, Vernon Hills, IL 60061-9907.(312) 634-8888.

**12-14: New England Park Association Fall Conference and Workshop,** Lighthouse Inn, Cape Cod, Mass. Contact: Jeff Maron, NEPA, Wickham Park, 1329 West Middle Turnpike, Manchester, CT 06040; (203) 528-0856.


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# Dylox Oftanol

COVER STORY


TOWARD 2000

# LIQUID VS. DRY: THE PENDULUM SWINGS

As customers demand more dry fertilizers because of what they see in the news, the lawn care industry responds.

*by Terry McIver, associate editor*

Is the lawn care industry doomed to be forever pestered by image problems?

Like a toy poodle nipping at its heels, outcry against chemical product safety or efficacy are relentless.

Even within the industry itself, there are biases toward certain products—inclinations that have shaped how companies do business.

In this case, the subject is liquid and dry fertilizers: what do you use, and why?

When ChemLawn first treated lawns in the late 1960s, it was the trailblazer in liquid lawn care. High-tech, high-volume was the way to go. By the late 1970s and early 80s, there was a preponderance of liquid lawn care companies.

The image problem began about 1983. Activist and media attention and phrases such as "spray drift" and "runoff" and "seeping into the groundwater" aroused public demand for more granular fertilizer applications, which many companies were already using.

So we touch ground in the 1990s, although we're not always landing feet first. And beyond the hype and misinformation, there are valid reasons to choose one or the other formulation.

### Agronomic equality

Dr. Chuck Darrah, president of AgVantage, a Columbus, Ohio agricultural consulting firm, says that

agronomically, liquid and dry fertilizers can be used to perform equally.

He reminds turf professionals that, "most nitrogen sources that are used in dry fertilizers are available in liquid form, for example, urea."

Urea is the most commonly-used form of nitrogen in both liquid and dry lawn fertilizers. Darrah says research has shown little or no difference in turf growth and color response to the two forms of N application.

"Likewise," adds Darrah, "the controlled release methylene urea fertilizers as well as the slow release ureaformaldehyde fertilizers and IBDU can be used in liquid sprays or dry fertilizers. Their performance is the same with either application method. The most common exception to this rule is sulfur-coated urea, because it is a product which should only be applied dry. And with a few exceptions the same case can be made for all pesticides. They are available as liquid or dry products and either form can be used to achieve the same results."

## View from the field

Lawn care professionals interviewed by *Landscape Management* all prefer granular fertilizers over liquid formulations. Their reasons range from the technical to the psychological.

"You don't have as much surge growth—or quick growth—with granular products as you have with liquid applications," says Bob Priest of Personal Touch Lawn Care, Denver.

Tim Combs, of Combs Landscaping in Westlake, Ohio, says his company has used granular products since it entered the lawn care business 20 years ago. Combs prefers granular products because they are less volatile than liquids.

"With the granular," says Combs, "you get it down into the soil with a little better effectiveness.

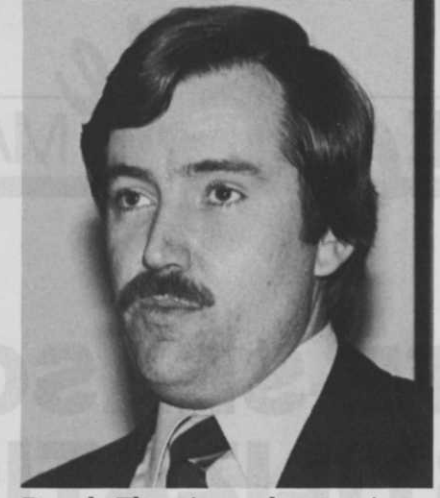
"Another nice thing about a granular product," explains Combs, is that you can target it. Of the four applications we use, only one has a pesticide in it which would be the pre-emergent, pendimethlin. The remainder are straight fertilizer."

Adds Priest: "People prefer granular for a lot of reasons. Granular is more old-fashioned, and I personally feel granular applications are safer."

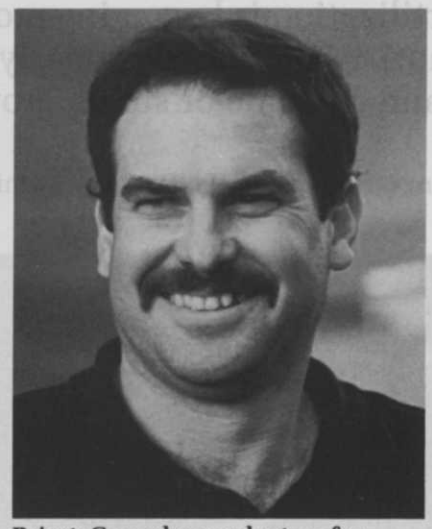
Harper prefers granular products in the fall, since customers are less likely to mow it out.

## Freedom of flexibility

Darrah stresses the flexibility liquid



**Darrah: There is an advantage in being able to use both formulations.**



**Priest: Granular products safer.**

products lend to the lawn care arsenal, and says surge growth is a myth.

"With liquids," says Darrah, "changing N-P-K grades, using a pesticide at different rates or using multiple pesticides can be easily accomplished. With dry materials, specific products need to be planned, purchased, stored and carried to the site to provide as much flexibility."

There are also those special times when a suitable dry material may not be available. At those times, it's liquids to the rescue.

An example Darrah cites is the situation that requires an application of fertilizer, a pre- and post-emergence weed control product, and insecticide simultaneously.

"This can be easily accomplished with liquids," says Darrah, but it means multiple trips over the lawn to accomplish with drys.

## Initial investment spector

The cost required to outfit trucks and provide for storage is a basic—if unglamorous—reason companies may choose dry fertilizer products.

Mike Turner of Custom Lawns, North Olmsted, Ohio, says that the need to get a business off the ground is a great motivator.

"When we first went into business," recalls Turner, "it was easier to start up with a dry method of application, in terms of equipment. You don't have that tank truck investment."

That concern is echoed by Bob Mann of Hunt & Hulteen, Brockton, Mass., who says the time to apply liquid and dry products is "pretty much a wash."

"And with the significant investment in a liquid system comes the containment system and regulations," adds Mann. He says the state of Massachusetts has a set of regulations pending which would place restrictions on containment systems.

The "all dry" full-service lawn care programs really don't exist, in Darrah's opinion, because common broadleaf weeds cannot be effectively controlled with dry post-emergence weed control products.

Turner believes there is a growing market for granular products, and cites the recent move by some larger, predominantly liquid chemical lawn care companies to granular products.

Degree of efficacy does not influence Turner's decision to go granular.

"We do about 2400 lawns," he says, "and the net result is usually the same. I wouldn't be upset if my only choice was liquid or if my only choice was granular."

Turner lucks out every so often when he encounters prospects who say flat out, "I don't want the liquid." Those people, says Turner, are already sold on the dry product, and the point is moot.

## Appearances are everything

It's also not just *what* you spray, but how you spray it, as one applicator told of a study that showed brown-colored spray hoses are less likely to incite homeowner concern than yellow hoses.

Are some people simply *afraid* of liquid products? "They want to believe that what a dry company is applying is different than what a liquid company is applying," says Turner, and he offers this example:

After a recent news report on a court decision concerning ChemLawn (see "Green Industry News," this issue), a customer told Turner she was glad to have him as her lawn man. "I wouldn't want what they put on the lawn," the customer said.

Turner's reply: "We put the same thing down that ChemLawn does. And it's the same product that you're going to be buying at your garden center." **LM**

# LATE-SEASON FERTILIZATION

Late-season fertilization is becoming more and more popular. And why not? When timed properly, it promotes root, shoot and rhizome or stolon growth.

*by Norman N. Hummel Jr., Ph.D., Cornell University*

This is the time of the year when thoughts turn to football, pumpkins and apple cider. But for the landscape manager, fertilizing turf areas should be at the top of your "Dumb Things I Gotta Do" list.

Fertilizing turf in the late season is not so dumb. In fact, it is a very sound and widely accepted practice that promotes the health and vigor of your turf.

Why fall? Cool-season grasses are often weakened from the onslaught of summer stresses. Fertilizing in the early fall (mid-August to mid-September in the North) helps the turf recover by promoting root, shoot and rhizome or stolon growth. Cool-season grasses grown in the transition zone can be fertilized later into the fall.

Fertilizing turf in the late season takes advantage of physiological changes in the plant. Turfgrass shoots stop growing when temperatures are consistently below 45 to 50°F. The leaves are still green and photosynthetic; that is, they are still producing sugars. Since the leaves have little use for this self-made food (they are not growing), they transport the sugars to other plant parts.

Benefits of fertilizing in the late season include enhanced root growth and early spring green-up, but without the flush of growth that would have occurred from an early spring application.

**Late-season fertilization has gained acceptance by the green industry recently, primarily because it takes advantage of physiological changes in the plant.**

**Fertilization of cool-season grasses in fall fosters early spring green-up (above). On warm-season grasses, the same practice is much more controversial.**

## Proper timing

The timing of application is important. Fertilize turf areas after the shoots have stopped growing, but well before the ground freezes. Fertilizing too early may force succulent growth and increase tissue hydration—prime conditions for winter injury. Fertilizing too late may not benefit the plant, and may actually result in fertilizer loss from run-off and leaching. (Don't confuse late season fertilization with dormant fertilization.)

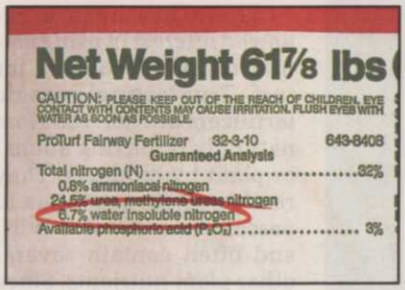
Also, select nitrogen sources that are not temperature-dependent (see table), so that the maximum benefit from the application can be obtained.

Late season fertilization of warm-season grasses is more controversial. The benefits of a late summer fertilization include extended length of greening into the fall, as well as early spring green-up. The early growth, however, may be more susceptible to frost dieback and desiccation. Late season applications of nitrogen may also make the turf more susceptible to direct low temperature injury.

The risk in making late season applications of nitrogen to warm-season grasses is greater on closer-cut turf, and in the northern regions of adaptation for the grass species involved.

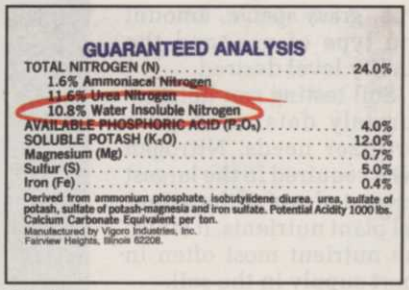
*continued on page 30*

# READ ...the fine print.




*Scott's ProTurf*


*Lebanon Country Club*




*Par Ex*

Down in the analysis area on every fertilizer bag, you'll find the "fine print" that tells you what the big print doesn't. Read all of it. Carefully. But most importantly, look at the percentage of Water Insoluble Nitrogen.

## Water Insoluble Nitrogen (WIN)... the key to superior turf.

The higher the WIN percentage, the longer your turf will remain green. And the less often you will have to fertilize. That's because WIN is the percentage of total Nitrogen that is truly slow release. Freeing small amounts of Nitrogen each time it's touched by water (Par Ex® with IBDU®) or activated by temperature or bacterial action (competitive products).

## No competitor can deliver as much usable WIN as Par Ex.

Only Par Ex contains IBDU—a unique Water Insoluble Nitrogen source that is 100% available to your turf in a single growing season. Consider that urea formaldehyde products (bacteria and temperature released) contain about one third of their WIN in the form of plastic polymers. Its long-term Nitrogen release is so slow, it's almost useless, and will most likely occur during the hottest periods, just when you don't want it.

For Sulfur Coated Urea (SCU), research has shown that by the time it is spread, about 50% is immediately soluble, effectively doubling your cost of controlled-release Nitrogen and cutting the benefit in half!

## Be sure to read your bag.

If the percentage of Water Insoluble Nitrogen isn't listed, there isn't any slow-release Nitrogen. If it *is* listed, chances are it won't be as high as the WIN percentage in Par Ex. Even if it is, we guarantee you that 100% of what we list as WIN is available to your turf every growing season. That means for every six months of growing, you'll receive an additional 46-53% more usable WIN than our competitors can deliver.

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If you fertilize warm season grasses in the late summer, use a fertilizer that contains about 1½ as much potassium as nitrogen (like 20-5-30). Potassium has shown to improve the winter hardiness of warm-season grasses.

### Fertilizer selection

The turfgrass industry is fortunate to have such a wide selection of fertilizer types and formulations available.

The abundance of products and their supporting literature, however, has made fertilizer selection confusing and sometimes misleading. The nutrient requirements of your turf areas will vary with soil type, grass specie, amount and type of use, and the quality level desired.

Soil testing can help accurately determine your fertilizer needs. Nitrogen (N) is required in the largest amount of any of the essential plant nutrients. It is also the nutrient most often in short supply in the soil.

Many sources of nitrogen are used in turfgrass fertilizers, some quickly available, some slowly available.

Quick release sources contain N as ammonium ($NH_4$) or nitrate ($NO_3$), forms readily available to the plant. Examples include urea (46-0-0), ammonium sulfate (21-0-0), ammonium nitrate (33-0-0) and ammoniated phosphates. Fertilizing with quick release N sources results in a quick response of short duration. The nitrogen in quick release sources is available regardless of temperature. Thus, they are well suited for late season applications.

Slow-release N sources, sometimes called controlled release or water-insoluble fertilizers, include natural organics, synthetic organics, or coated nitrogen materials. The release of nitrogen from slow release sources may require microbial breakdown alone, or in combination with chemical or physical breakdown. Since the activity of micro-organisms is affected by soil moisture and temperature, the rate of nitrogen release from some materials may vary with season and weather (see table).

**Fertilize turf areas after the shoots have stopped growing, but well before cold weather freezes the ground.**

### Slow-release selections

The amount of slow release nitrogen in a product is listed in the guaranteed analysis on the bag. The slow release portion of N in the product is listed as percent water insoluble nitrogen, and is expressed as a percentage by weight of the bag's contents. Coated fertilizers will have the slow release portion listed as percent controlled release N, or CRN.

When comparing fertilizers, it is useful to know the percentage of the nitrogen in a slow release product. This can easily be determined by dividing the percentage of water insoluble nitrogen (WIN) by the total N and multiplying by 100.

For example, a 24-4-12 turf fertilizer has 24 percent total N, 4 percent available phosphoric acid, and 12 percent soluble potash. If we divide 12 by 24 and multiply by 100, we have determined that half the nitrogen in this product is WIN, or slow release. The other half is quickly available N. A turfgrass fertilizer should contain at least 35 percent of the nitrogen as WIN to have any slow-release characteristics.

There has been a renewed interest in using natural organic fertilizers for turf. True natural organic fertilizers are derived from naturally occurring animal or plant by-products. They rarely contain more than 10 percent N, most of it WIN, and often contain several other plant nutrients. Since the release of nitrogen from natural organics depends on microbial activity, they may not be the best choice for a late season application.

Milorganite is an activated sewage sludge that has long been the standard natural organic product used in the turfgrass industry.

Recently, the selection of natural organic fertilizers has increased to include several other products composed of dried blood, bone meal and seed meals (Ringer products), and poultry litter (Sustane, Plant Right). Again, the use of these products in a late season program would be equivalent to a dormant fertilization. The

## Environmental aspects of late season fertilization

The agronomic benefits of late season fertilization are so well documented that it has become accepted practice in the turfgrass industry. But are there any potential adverse effects to late season fertilization?

Late fall, winter, and early spring are times of the year when many aquifers are recharged by the ample precipitation these seasons bring. It is a time when the potential to leach soluble substances, such as nitrate, is at its greatest.

Researchers at Cornell University have studied nitrate leaching from late season applications of nitrogen on the sandy loam soils of Long Island. They have reported that as much as 40 percent of the applied nitrogen will leach below the rootzone when soluble sources are used. This not only represents a serious environmental threat (all of Long Island's potable water comes from aquifers), but it is an inefficient use of nitrogen as well.

It was also shown from these studies that nitrate leaching can be prevented by using slow release sources. The catch-22 is that the agronomic performance of an N source in a late season application was directly related to its potential to leach. In general, fertilizers that did not leach did not perform well.

The outcome of this work has forced us to take a second look at our recommendations for fertilization on sandy soils. We are no longer recommending late season fertilization to consumers on Long Island (and other areas with highly permeable soils), and cautioning commercial applicators to select only N sources such as IBDU and sulfur-coated ureas for their late season application.

Turfgrass managers in similar situations around the country should consider the same.

*—Dr. Hummel*□