Liquid or Granular?

Determine the goal of fertilizer use before choosing its form

Liquid or granular — which one is used and why? Many superintendents use both types of fertilizer, and some superintendents are switching to an all-liquid program. But no matter the form of nutrients, the bottom line is creating an environment for good uptake.

Charles Peacock, Ph.D., knows superintendents who have an entirely foliar fertility program, yet the professor and extension turfgrass specialist in the department of crop science at North Carolina State University knows superintendents who are perfectly happy with their granular program that includes supplemental liquid fertilizer.

For superintendents using liquid fertilizer in combination with other products, they need to make sure everything is compatible, says Rich Gaussoin, Ph.D., professor and extension turfgrass specialist in weed science at the University of Nebraska-Lincoln. He encourages superintendents to test their irrigation water to determine the pH level because some products need a buffering agent.

There are more biologically active products coming to market, too.

"Most foliar products have things like elicitors, phosphites, amino acids and cytokinins in them that are beyond fertility, and get superintendents through the summer," Gaussoin says. "It's way beyond nutrition."

In the South, liquid applications on fairways are occurring mostly at high-end clubs with zoysiagrass, says Mike Richardson, Ph.D., professor of turfgrass management and physiology in the department of horticulture at the University of Arkansas in Fayetteville. Superintendents are adding iron to get color.

"More are using foliar fertilizers on fairways and tees than I thought," Richardson says, citing a survey his department conducted. "It's done to give the turf a pop before a big event."

Still, Richardson preaches to superintendents that they need to think why they're putting down a foliar fertilizer and what products they use. — *John Walsh*

wrong. You want to get those nutrients in then so the roots can grow."

Cost affects timing. "Fertilizer was never an issue before because it was cheap," Richardson says. "Now, superintendents want to save money, so they're asking more questions about getting good conditions with less fertilizer. Timing is more important, and slow-release products are attractive in the rough and fairways."

Additionally, Europeans are measuring the nutritional demands of turf by conducting research about demand-driven fertilization, in which superintendents apply different levels of nitrogen and at different growth stages.

Turf type

Turf type is yet another factor for fertility. For example, perennial ryegrass, usually in fairways, needs more fertilizer than other cool-season turfgrasses, Gaussoin says. With spreading grasses on greens, such as bermudagrass and creeping bentgrass, superintendents should be careful with nitrogen because too much of it results in thatch, which can compromise play.

"In my region, the cool-humid region, superintendents frequently apply nitrogen to try and stay ahead of dollar spot," Bigelow says. "You can reduce the severity of this disease with a sound fertility that promotes rapid recovery."

Warm-season turf, bermudagrass especially, needs more nutrients than cool-season turf, Richardson says. Cool-season turf on greens typically receives 1.25 pounds to 1.5 pounds of nitrogen per active growing month, usually five months. Fairways and tees usually receive 5 to 8 pounds of nitrogen annually. Zoysiagrass requires lower fertility. On greens, 1 to 2 pounds of nitrogen per 1,000 square feet is normal for a whole season. Too much fertilizer can cause disease problems, he says.

The amount of fertilizer needed depends on geographic location, the soil type and management approach.

All natural

Naturally organic and biosolid products are gaining popularity, especially in the Northeast, Bigelow says.

A turf plant doesn't care what form of nitrogen, potassium and phosphorus it's given — it will take it up as an ion, Peacock says. In organic fertilizer, nitrogen is in a more complex form that needs to be broken down, a process (composting) that needs to happen before a plant can uptake nitrogen. Because it depends on microbiological activity to break down nitrogen and other nutrients, it needs soil temperatures of 60 F and higher to work. Conventional fertilizer works in any soil temperature.

Ultimately, superintendents need to understand the growth patterns of the turf they manage.

"It's not what you use, it's how you use it and when," Peacock says. "You need to match what the turf requires with how you groom it for a particular use." ■

Walsh is a contributing editor to Golfdom.

PHOTOS COURTESY: LEBANONTURF (TOP); AGROTAIN

Ron Furlong likes to spoonfeed greens on a regular basis.

It's tempting to reduce nitrogen levels on greens to keep them smooth and fast – but not at the sake of jeopardizing their health for four days of glory

Tournament Prep & Fertility

BY RON FURLONG, CONTRIBUTING EDITOR

HAVING GOLF COURSES PRIMED for Major tournaments makes for great theater. This past year, all three courses that hosted majors in the United States — Augusta National, Bethpage Black and Hazeltine National — were all in phenomenal shape, and it showed on our high-definition television screens as well as with the players' comments who, almost man for man, raved about each course.

Although most superintendents will never get to host a Major, it's exciting when an opportunity comes along every now and then to primp your course for some special event and give it the old Augusta touch for a week. I received such an opportunity this past summer, hosting a PGA qualifier for the Pacific Northwest. It was fun to deck out the course for the four-day event and present the best possible "PGA Tourney" conditions we could.

However, what I soon came to realize, while prepping for the event, was

PHOTO COURTESY: AVALON GOLF CLUB

just how stressful such conditions would be on the course and, specifically, the greens. And, upon further realization, I realized how important turfgrass fertility would be, combined with all the other management factors, in the quick recovery of the turfgrass from the stress we would be heaping upon it.

The "other management factors" I mentioned above, excluding fertility, include (but are not limited to) mowing height, rolling, verticutting and topdressing, moisture levels, wetting agents and plant growth regulators.

Here's a quick rundown of these factors:

- **Mowing height.** In midsummer, we normally mow our Poa greens at .120. For this event we dropped them to .110. The PGA wanted our greens in the 10.5 range on the Stimpmeter. Any quicker, with our undulations, would've been bordering on unfair. We had to be careful not to get them too quick. During the week they Stimped a perfect 10.5 to 11.
- **Rolling.** Normally (excluding the occasional one-day tourney), we roll every other week. For the qualifier, we rolled each of the four days in conjunction with a mow before each roll.
- **Verticutting and topdressing.** A week before, we verticut and applied a light topdressing, as we do every second week during the season.
- **Moisture levels.** We kept the greens on the drier side, electing to hand-water daily while letting the computer water lightly at night. Again, being careful to keep them firm, yet being able to hold a shot.
- **Wetting agents.** We applied a wetting agent at a lighter than normal rate about nine days before the start of the tournament.
- **Plant growth regulators.** Normally, we apply Primo Maxx every 20 days. We shortened the interval to 14 days and applied four days before the event.

No other factor is as singlehandedly important to any golf tournament than the weather. We are all at Mother Nature's mercy, and must react to whatever she tosses our way. We are like a hitter in the batter's box as she throws us a curve ball, followed by a tricky slider, followed by a high heater and then, lastly, a wicked change-up. Mother Nature has a nastier change-up than Johan Santana (wonder what the Yankees would pay for her services?).

The change-up she fired at us was the fact that normally, from June 1st to the end of August, we receive an average of 6.5 inches of rain. This year the total was a measly 1.5 inches.

So, all of this brings us to fertility. Obviously, you want to keep the greens somewhat on the lean side heading into a tournament. Lush turf is slow turf. However, you don't want to caution too far on the lean side, either. Starving Poa often results in a weak plant that has trouble recovering from stress. That

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Don't stop fertilizing greens for a tournament to make them fast. To keep them quick, hand-water the greens to keep them on the drier side.

PHOTO BY: LARRY AYLWARD

» Have a solid fertility plan going into the tournament. You don't want to jeopardize the future health of the course's greens for four days of glory.

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wasn't what we wanted, but it can be a tricky line to toe.

Maintaining a slightly lower nitrogen level a couple weeks before and then into the week itself, while perhaps upping the potassium level just slightly, can possibly be a good plan of attack. But replacing those lost carbohydrates in the heat of summer is vital — somehow enhancing the root growth during the time of year when you simply don't have them (long roots, that is).

Mike Erb is a sales representative for Wilbur Ellis in the Greater Seattle area, and a valuable resource for fertility guidance for many superintendents, myself included. Mike agreed with me that having a solid fertility plan going into such an event is the major key, instead of reacting afterward when the damage is most likely already done. You don't want to jeopardize the future health of the greens for four days of glory.

"I wouldn't lower the fertility," Mike told me. "Turn off the irrigation and hand-water for the event. Keep them quick with a plant growth regulator and rolling, but avoid dropping fertility rates. Keep them growing."

Spoon-feeding with low nitrogen levels, like most of us are doing on a regular basis anyway, can be key in providing the best timing for detailed control. This especially holds true for those of us with Poa greens, where it's not uncommon to have upwards of 20 different strains of Poa on one green. The frequent (every two weeks) feeding is essential to maintain, if nothing else, consistency of the playing surface. Biostimulants, which help replenish but don't overstimulate, are another useful tool during such stressful periods, replenishing with gibberellins, cytokinins and auxins.

The disadvantage most courses have when they primp for a special event, compared with a U.S. Open or a PGA Championship course, is we don't get to shut down the greens right after the event. Often, a course hosting a Major, or even hosting a regular annual PGA Tour event, will have the luxury to raise heights, give a good feeding and stop mowing for a few days.

Revenue dictates a different story for most golf clubs. In fact, the day after this four-day event, we had an outside group invade our course with a 27-hole shotgun tournament.

The best plan is to simply have a plan. Have the foresight to understand your greens and how they will be after your big event.

No one knows your greens better than you. Don't mortgage the farm on a single tournament, no matter how important. Get those roots down as deep as you can going into the tournament and hope Mother Nature misses the strike zone with her change-up. Maybe, if you're lucky, she'll groove a batting-practice meatball right over the plate. ■

Furlong is superintendent of Avalon Golf Club in Burlington, Wash., and a long-time contributing editor to Golfdom. He can be reached at Rfurlong5@gmail.com

PHOTO BY: IMAGE 100 LTD.

Todd Lupkes
Palouse Ridge
Washington State University

"I wanted to have nitrogen readily available in the soil at all times. I didn't want peaks and valleys," Lupkes said. *"We needed the turf to fill in faster, grow stronger and keep its color."* Lupkes researched many products, finding success with …

What's his secret? Find out at
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STORY AND PHOTOS BY LARRY AYLWARD, EDITOR IN CHIEF

Thinking-Man's Superintendent

Jeff Carlson is always looking for alternative ways

He earned an English degree but Jeff Carlson ended up working in the golf course maintenance profession. With that background, the literary Carlson could write a book about how he has become one of the brainiest golf course superintendents in the business.

The 60-year-old Carlson, superintendent of the Vineyard Golf Club on Martha's Vineyard, is always thinking of ways to do things differently on his course, from controlling dollar spot to killing dandelions, because the links-style course is prohibited from using conventional pesticides. That's quite a challenge, considering the Vineyard is also a high-end private club where golfers, from actor Bill Murray to Boston Celtics star Ray Allen to President Barack Obama , expect excellent conditions.

"The golf course has come a long way," says Carlson, who has been with the Vineyard since the project was conceived in 2000.

Carlson and his crew rely on organic pesticides and fertilizers, and myriad cultural practices to maintain the course, which gets less than 10,000 rounds a year. Carlson is confident about the practices he has implemented. It's no wonder.

On a recent summer day on Martha's Vineyard, where a slight ocean breeze blows across the island, the turfgrass at Vineyard Golf Club looks healthy and vibrant. Carlson studies the 12th green as he walks across it. There's evidence of dollar spot in the bentgrass, but not enough for even the most persnickety of golfers to gripe about.

While Carlson knows his course's greens look as good as most country clubs' greens, he's not smug about it. He knows a turf disease could arrive

to maintain turfgrass. **He must.**

like a thief in the night, and he doesn't have the arsenal of synthetic fungicides to stop it in its tracks like most golf courses do.

"I'm knocking on wood like crazy," Carlson says.

With English degree in hand …

Carlson was born near Buffalo but was raised in western Connecticut. He attended Drew University in Madison, N.J., where he earned his English degree. After graduation, Carlson moved to Cape Cod, where his family owned a home. It was 1971, and the well-educated Carlson had no idea what he wanted to do with his degree. But Carlson knew he liked to play golf, so he went to work on the tiny maintenance staff at Brewster Golf Club, a nine-hole course on Cape Cod, which has since changed its name to the Ocean Edge Golf Club.

After a year, Carlson was promoted

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to assistant superintendent at Brewster. He liked the business so much he enrolled at the University of Massachusetts to earn a turfgrass science degree. When Brewster's superintendent left in 1975, Carlson was promoted to the position.

While Carlson has a reputation for being an ecologically minded superintendent, he doesn't believe pesticides hail from Hades. Carlson is a product of his environment, literally, when it comes to turf management. He has worked most of his superintendent life in southeast Massachusetts, near the coast. It's an environmentally sensitive area, where government restrictions on pesticide and fertilizer use are as common as sellouts at Fenway Park. Carlson came to the Vineyard from Widow's Walk Golf Course, an environmental demonstration course in Scituate, Mass., on the coast between Boston and Plymouth. Carlson relied heavily on organic pesticides there, although he used synthetic products sparingly.

There are four courses on Martha's Vineyard — two nine-hole and two 18-hole tracks. Carlson says the other courses, which have been open more than 30 years, are allowed to use pesticides, although they use them minimally.

As expected, there was public backlash when it was announced in 2000 that a new golf course would be built on Martha's Vineyard, whose residents are very protective of their island and careful not to let in anything perceived as environmentally unwholesome. A "Ralph Nader for President" bumper sticker doesn't stand out in Martha's Vineyard like it would in a place like Peoria, Ill. The locals opposed the course mainly because they were worried any pesticide or fertilizer use could negatively impact the island's water quality.

Dandelion patches are located throughout the course in designated areas.

Meanwhile, Carlson was consulted for the Vineyard project. Developer Owen Larkin heard about Carlson's work at Widow's Walk. Larkin figured he'd have to go down a similar road with his course if he wanted to get it built.

In the end, the course was allowed to be built with a few catches, one being that it had to be maintained organically. That was mollified by the locals, who backed off their protests. Larkin then offered the superintendent position to Carlson, who was apprehensive about taking it considering he wouldn't be able to use *any* conventional pesticides. But after thinking about it, Carlson decided he was up for the challenge.

The cultural king

Carlson is one of the brightest superintendents in the business — because he has to be. Since he can't rely on a synthetic herbicide to remove a patch of clover, Carlson must get creative in his approach to eradicating it.

For instance, Carlson's crew rolls the greens every morning before mowing them. Joe Vargas, the well-known turfgrass professor from Michigan State University, advised Carlson to do this to help control dollar spot. Carlson says he rolled his eyes

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