

# Phosphite Technology: Fertilizer or Fungicide?

*The most successful spray program I've implemented at Cantigny since 1996 has been Aliette Signature and Daconil Ultrex on greens every two weeks through June, July and August. Due to the overwhelming success of the Signature program on greens, I wanted to expand that type of program to my fairway turf. Obviously, for 56 acres of fairways, that would prove to be cost-prohibitive.*

*During periods of high stress . . . the roots of the turf plants excrete enzymes that actually stimulate disease pathogens like pythium. The obvious key is to prevent the plant from reaching this level of stress, therefore reducing its susceptibility to disease.*

I first considered an alternative to the Signature program when some of my trusted sales representatives introduced me to phosphite fertilizers. These phosphite fertilizers with an analysis of 0-28-26 were touted as *Aliette Signature in a liquid form without the aluminum tris*. I was originally skeptical, but mostly curious as to how a fertilizer could mimic this fungicide. My fairway soil tests showed that I was very low in phosphorus and potassium, so I decided to design a program incorporating 0-28-26 on a biweekly basis. Since I needed phosphorus and potassium anyway, if I happened to receive some fungicidal activity as well, that would be a bonus. All the while I was ready to spray a knock-down pythium product at a moment's notice.

At the June 2001 MAGCS meeting at Point O' Woods Golf and Country Club in Michigan, Dr. Joe Vargas gave an educational seminar, speaking on phosphite fertilizers and Chipco Signature. Most interesting to me was the response of turfgrass plants to these products. According to Dr. Vargas, the application of Signature creates a fungicidal response within the plant in several ways. These are:

- Increasing production of "phytoalexins," or the natural fungicides within the plant.
- Slowing the respiration of the plant, which assists in getting through stressful periods.
- Stimulating the accumulation of carbohydrates within the plant.
- Increasing the thickness of cell walls.

All of these plant responses have been proven effective in warding off pythium infections and summer bentgrass decline. The key to this program's success is, in my opinion, limiting the stress of the turfgrass plant. During periods of high stress, Dr. Vargas noted that the roots of the turf plants excrete enzymes that actually stimulate disease pathogens like pythium. The obvious key is to prevent the plant from reaching this level of stress, therefore reducing its susceptibility to disease.

When designing my 2002 fairway program, I set out to mimic the

*(continued on page 12)*

Signature program as closely as possible. I decided to use Phosguard 0-28-26 phosphoric acid, or "phosphite technology fertilizer," in an attempt to stimulate a similar response in the turfgrass plants as achieved with Chipco Signature. The key to this program, however, is repeated applications on a regular basis. The following (see shaded box below) is an illustration of my 2002 fairway program and rates of products used. Included are the outbreaks of active pythium on untreated check plots on tees.

It is exciting to note that during this year, there was not a single outbreak of pythium on any fairway even when disease was active on the indicator areas. It was my strategy from very early on to purposely not treat all of my key indicator areas for pythium. This was to provide myself with check plots to confirm the presence of active pythium. I was very successful in growing disease in all of my key indicator plots on June 26 and July 22, which proved to me the presence of pythium. It is important to note that

on every occasion since 1995, when I had disease on my indicator areas I also had disease on most problem areas on fairways. My confidence in the phosphite fertilizer was building throughout the season as my fairway turf remained disease-free through high-stress periods. However, it was poor judgment on my part not to tank mix Compass with my Bayleton application on July 25. I had an outbreak of brown patch due to high disease pressure through July 31, which forced me to spray a curative application of Compass. The debate was on, and due to the upcoming Illinois Amateur Championship, an application of Banol was added with the Compass to insure clean fairways for the tournament.

After the growing season, I was able to take a good look at the results of my spray program as they correlated to disease pressure and reported disease activity. This was easily analyzed due to the fact that Cantigny is a weather reporting station for the Interactive Turf Program through the CDGA and

University of Illinois. On a regular basis, Cantigny and other golf courses download site-specific weather data as well as disease activity to Lee Miller of the CDGA. Lee then compiles the data and plugs it into several disease-predicting models and determines the threat of disease activity. The adjacent graph illustrates the model's predicted activity; the actual reported activity from several sites; and the impact of application of the phosphite fertilizers on Cantigny fairways in 2002.

Overall, I felt I achieved good disease control with the 0-28-26 fertilizer after repeated applications throughout the season. From my observation, it appeared the 0-28-26 mimicked the results of the Signature program. It's important to note that there are many phosphite fertilizer products on the market at this time. Some of the products are labeled as:

- Chicagoland Turf's 0-28-26 with micros.
- Phosguard 0-28-26.
- Nutri Grow PK from Cleary's.

### 2002 FAIRWAY PROGRAM

1.) May 21

- Primo @ 0.15 oz./M
- Curalan @ 1.0 oz./M
- Liquid Iron @ 3.0 oz./M

2.) June 13

- Primo @ 0.15 oz./M
- 26 GT @ 3.0 oz./M
- 0-28-26 @ 4.0 oz./M
- Sprint 330 @ 2.0 oz./M

*June 26*

*Pythium active on tee check plots. All fairways free of disease.*

3.) June 27

- Primo @ 0.15 oz./M
- 26 GT @ 4.0 oz./M
- 0-28-26 @ 4.0 oz./M

4.) July 11

- Primo @ 0.15 oz./M
- 26 GT @ 4.0 oz./M
- 0-28-26 @ 4.0 oz./M

*July 22*

*Pythium active on Youth Links tees. All fairways free of disease.*

5.) July 25

- Primo @ 0.15 oz./M
- Bayleton @ 0.5 oz./M
- 0-28-26 @ 4.0 oz./M
- Turf Tech II Bio @ 4.0 oz./Ac

*July 31*

*Brown patch active on fairways.*

6.) July 31 and August 1

- Banol @ 1.0 oz./M
- Compass @ 0.2 oz./M

7.) August 8

- Primo @ 0.1875 oz./M
- Banner Maxx @ 0.65 oz./M
- Daconil Ultrex @ 3.75 oz./M
- Liquid Iron @ 2.0 oz./M

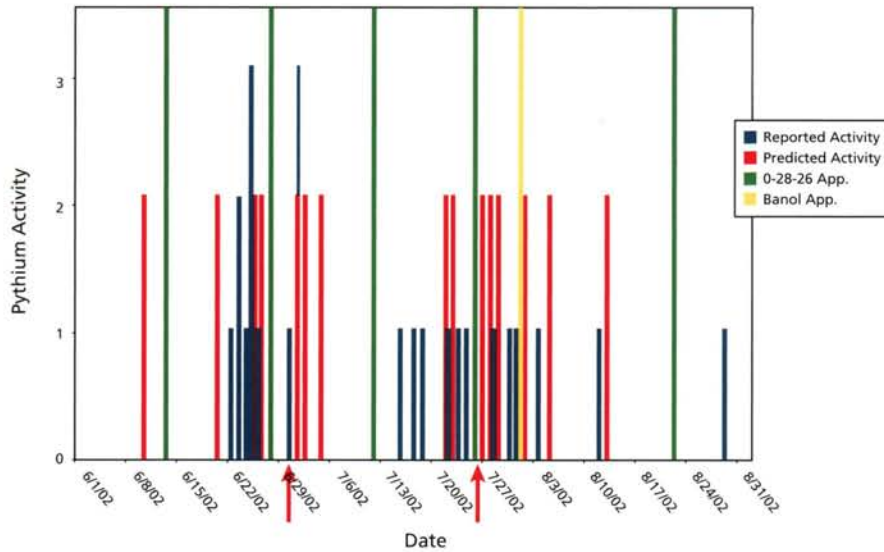
*August 12-15*

*Illinois State Amateur Championship.*

8.) August 21, sprayed problem fairways; August 27, finished open fairways

- Primo @ 0.25 oz./M
- Curalan @ 1.0 oz./M
- 0-28-26 @ 4.0 oz./M
- Turf Tech II Bio @ 4.0 oz./Ac

Graph A  
**Pythium 2002**  
**Reported/Predicted Activity and Treatments**



6/26, 7/22 – Pythium active on check plots@ Cantigny; Fairways still clean

These are foliar nutrient fertilizers and NOT fungicides! Products similar in chemistry that ARE labeled as fungicides for the prevention of pythium are:

- Riverdale’s Magellan.
- JH Biotech’s Fosphite.

The most obvious reason for using the phosphite fertilizers for pythium prevention as opposed to Signature is cost. Refer to Table 1 for cost comparisons.

The phosphite fertilizer program implemented on fairways at Cantigny appears to be a complete success. Fairways stood up to stressful periods and maintained health and vigor throughout the season. I plan to use phosphite fertilizers as my primary defense against pythium in fairways for 2003. I have a very positive outlook on what the future will bring with the use of phosphite fertilizers incorporated into our entire turf-care program.



TABLE 1 COST COMPARISON FOR 56 ACRES OF FAIRWAYS				
	NUMBER OF APPLICATIONS	PRICE PER ACRE	PRICE PER APP.	TOTAL PRICE
Signature	5	\$190	\$10,640	\$53,200
Phosphite Fertilizer	5	\$68	\$3,808	\$19,040
Magellan Fungicide	5	\$163	\$9,128	\$45,640
Banol 6E	1	\$156	\$8,736	\$8,736
Subdue Maxx	1	\$162	\$9,072	\$9,072

Listed prices are approximations.

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