Learning to Use Natural/Organic Fertilizers

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Natural/organic fertilizers have been relegated to a niche market in golf turf management since synthetic fertilizers became widely available post-World War II. However, resurgence in the use of natural/organic fertilizers is probable given the volatility of the prices of synthetic fertilizers and the developing "green movement" in the US and beyond. For example, a bill likely to be passed by the WI legislature this legislative session will ban P applications to turfgrass unless a need is indicated by a soil test. However, the bill will likely contain an exemption for biosolids (like Milorganite) or manure-based organic fertilizers. That means if your soil test P levels are high, a natural/organic fertilizer will be your only legal option for applying P. Because turf managers will almost certainly use more organic fertilizers in the future, I have decided to share what I have learned from my research and others about using organic fertilizers to get the best results.

The most obvious observation is that one pound of N from an inorganic fertilizer never produces the same result as the same-sized application of an organic fertilizer. Figure 1 illustrates the effect nicely. Each point on the figure represents the visual color rating of a plot where half was fertilized with an inorganic fertilizer and the other with the same rate using an organic fertilizer. Notice that when the color rating is 7.8 with inorganic fertilizer, the rating is around 7.5 for the organic fertilizer side. These data were collected and analyzed by Dr. Wayne Kussow.

The explanation for the findings described above is shown in Figure 2. This figure shows the percent of N in a widely used natural/organic fertilizer that is converted to plant available N over a period of 40 days at two different temperatures. As you can see, even with soil temperatures at 90°F for 40 days, only half of the N in the organic fertilizer was converted to plant available forms. At a more reasonable temperature, only a quarter of the N became plant available. This indicates that 2-4 times more natural/organic fertilizer would need to be applied to equal the response from an inorganic fertilizer. This is not a new concept to farmers, who only consider 30% of the total N in manure

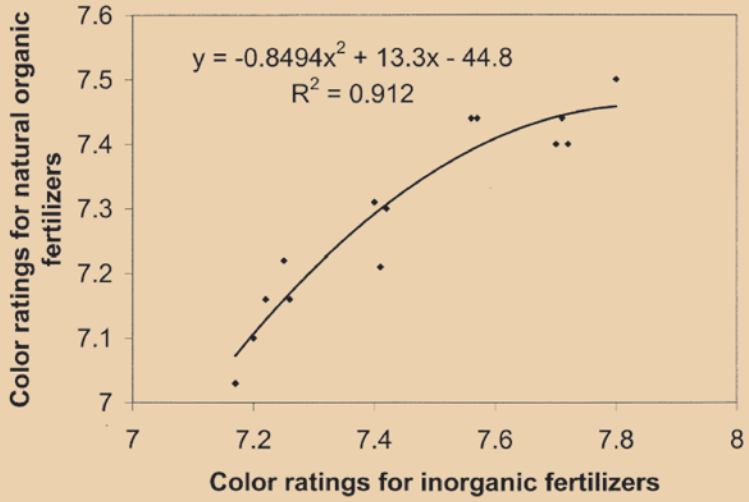

Figure 1. Color ratings for turfgrass fertilized with inorganic fertilizers are always greater than when organic fertilizers are used.

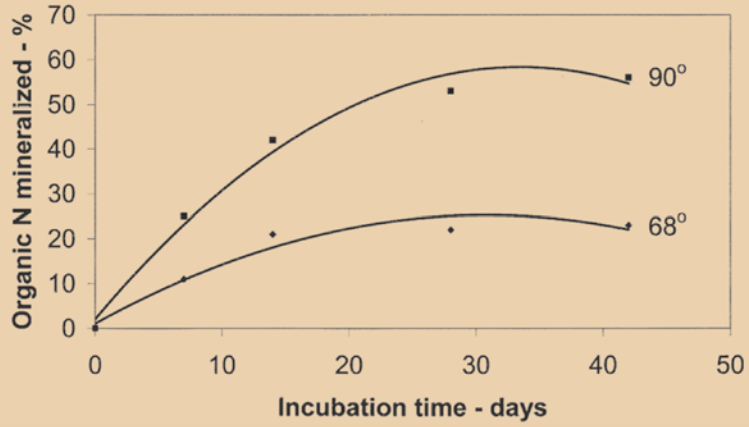

Figure 2. The amount of N converted to a plant-available form over time at either room temperature or 90 F. Even when soil temperatures are 90 F for forty straight days, this widely used organic fertilizer only relinquished roughly half of the N that was applied to the turf. This data was collected and graphed by Dr. Wayne Kussow.

to be plant available in the first season, and 5% of the total is assumed to become available in the second season. If a farmer wants his corn crop to receive 160 lbs N/A, he will apply manure at a rate of 533 lbs N/A. Why shouldn't we make the same assumptions for natural/organic turf fertilizers?

Finally, all natural/organic fertilizers are not created equal. I used to think that the color response differences from one organic fertilizer to the next were impossible to predict and was related to the particular quality of the manure or biosolids used to make the fertilizer. However, the results from a natural/organic research trial this summer really caught my eye. The predictive value was staring me in the face: the soluble N content of the natural/organic fertilizer listed right on the label. The label of natural/organic fertilizers are often ignored because they usually contain 100% insoluble N. However, in this study we used natural/organic fertilizers with a fairly wide range of soluble N contents. As you can see in Figure 3, the higher the proportion of soluble N, the quicker and greater the color response is to the application. In fact, for most of the season, the fertilizer with a nearly 50-50 mix of soluble and insoluble fertilizer performed similarly to the Scotts Turf Builder fertilizer. Milorganite contains 10 - 15% soluble N, and out performed the two fertilizer without any soluble N. If you want to apply a natural/organic fertilizer in spring or fall, having an appreciable soluble N content will provide a quicker green-up than a 100% insoluble N product.

As legislative mandates and the public desire for organic everything continues to increase the use of natural/organic fertilizers for golf management, keep these points in mind.

1. To get a similar response, you will need to apply organic fertilizers at nitrogen rates at least double what you would normally consider for an inorganic fertilizer application.

2. For quicker green up and probably more efficient use of N, use a natural/organic fertilizer that contains some proportion of soluble N. This is especially important for applications made in the spring and the fall.

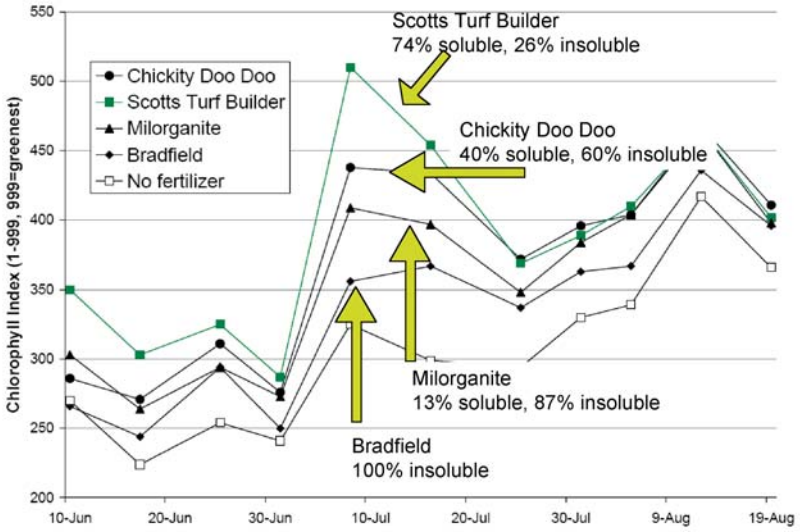

Figure 3. The amount of soluble N in natural/organic fertilizers gives an indication of how quickly the a greening response will occur. All of these fertilizers were applied at 1 lb N/M on June 5 and July 1, 2008.