Rate of N release varies by fertilizer, soil

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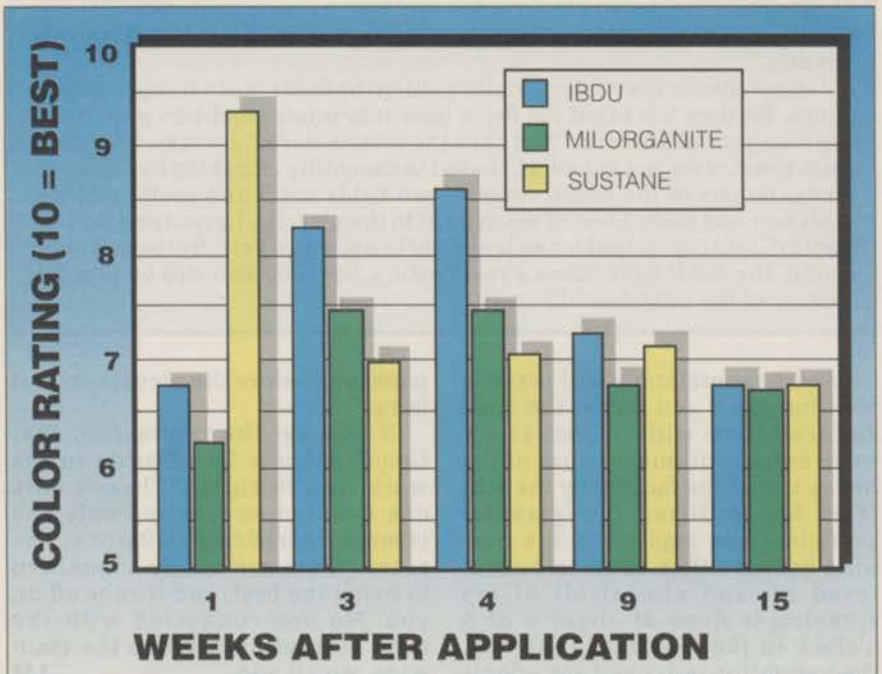

Figure 2. Average color ratings at three locations following June 9 fertilization. Rating scale was 1 to 10 with 10 best.

Source: Dr. Taylor

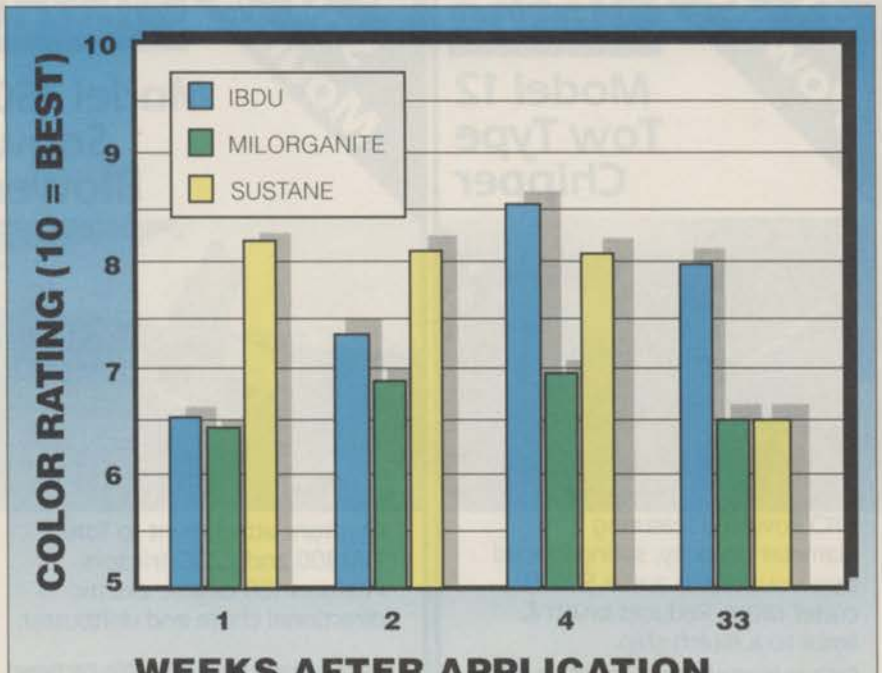

Figure 3. Average color ratings at three locations following September 27 fertilizer application. The 33 week color rating was May 19 the following year. Rating scale was 1 to 10 with 10 best.

Source: Dr. Taylor

Slow-release nitrogen (N) fertilizers are often used on golf greens, athletic fields, and other turfgrass areas, even though they're more expensive than quick-release types. Longer turf response and low burn potential are reasons for their popularity.

When choosing and using slow-release fertilizers, remember that release characteristics can vary dramatically with different materials and with different conditions.

Some slow-release fertilizers, such as sulfur-coated urea and Osmocote, are a quick-release N like urea, coated with a material that must be penetrated or broken before the N is released. While breakdown of the coating is supposed to result from micro-organism activity, physical breakage from traffic or rough handling can also increase the rate of N release.

One slow-release N source, IBDU, releases N slowly because the module into which the N is bound dissolves very slowly in soil water. In the case of IBDU, the rate of N release depends principally on the amount of water in the soil.

The moisture factor

Other slow-release forms of N, such as UF and Milorganite, release N slowly because micro-organisms must break down the N-containing molecules before the N can be taken up by the turfgrass plants. The release rate depends on how easily the molecules are broken down on the level of micro-organism activity.

During cool or very dry conditions, N release will be minimal because micro-organism activity is limited.

The point to remember is, the rate of N release (and thus the length of time that turf responds to a slow-release fertilizer application) can vary dramatically with fertilizer properties and existing soil conditions.

The results of some experiments in Minnesota and Wisconsin demonstrate this fact well.

Test procedures

In the experiments, the fertilizers IBDU, Milorganite, and Sustane (a natural organic fertilizer derived from composted agricultural wastes) were applied and evaluated at three golf course putting greens. The fertil-

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izers were applied at a rate of 2 lb. N/1000 sq. ft. on June 9 and September 27, 1988. Each fertilizer treatment was replicated three times on each green.

Following the June 9 application, a color response on the Sustane plots was evident within several days at all three locations, the most dramatic of which is shown in Fig. 1. Subsequent color ratings indicated the response to Sustane was of short duration (Fig.2).

Three weeks after the fertilizer application color ratings of the Sustane plots had dropped while IBDU plots were just coming to a peak. Four weeks after application IBDU plots were at their peak in terms of visual color.

Analysis of clippings taken four weeks after fertilizer applications showed that clippings from IBDU plots had higher N content (averaging 5.1 percent N) than clippings from either Milorganite plots (4.4 percent N) or Sustane plots (4.3 percent N).

Unlike Sustane or IBDU plots, the Milorganite plots never did show a period of substantial visible response to N being released, perhaps due to a gradual low level of N release throughout the the experiment. After two months all the plots had rather low visual ratings and the turf appeared to be in need of N.

Visual response

Following the September 27 fertilizer application, there was again a quick visual response to the Sustane plots (see Fig. 3). The response to Sustane did not fade as quickly as it had following the June application and turf on Sustane plots continued to have high color ratings up to four weeks after fertilizer application.

Turf color can indicate the need for extra N.

The longer residual response to Sustane may have been due to the cool temperatures of October, which reduced the microbial activity and thus lengthened the period of release of N from the Sustane fertilizer.

Visual response to IBDU again peaked about four weeks after application. Color ratings taken the following May (33 weeks after fertilizer application) demonstrated a definite beneficial color response to IBDU the spring following a fall application of fertilizer. At that time, response to Milorganite and Sustane applied the previous September had disappeared.

Different reactions

These experiments show slow-release N fertilizers react dramatically different in terms of turf response and residual time. Even a single slow-release fertilizer can have differing results at a different locations or at different times of the year for a single location. Consequently, in choosing slow-release fertilizers and in developing a turf fertility plan, it is best to test how the turf at your location responds to different fertilizers.

By putting out your own test plots and watching the response to several to several different fertilizers, you will likely achieve better results than by using general recommendations determined elsewhere.

In implementing an N fertility program, turf color can be an excellent indicator of the need for additional N. **LM**