STOP 16

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Nitrogen Carrier Studies

Merion Kentucky bluegrass sod was established in April, 1972. The treatments listed in Table were applied as outlined beginning May 2, 1972. All of the carriers studied release nitrogen slowly. Some also possess rapid nitrogen response properties.

The slow nitrogen release characteristic may be achieved by: (1) dependence on microorganism breakdown of the complex nitrogen contained in organic fertilizers, such as in ureaformaldehyde or sewage sludge. These carriers give faster release when temperatures are warmer because of greater microorganism activity; (2) limiting microorganism activity, such as with the sulfur-coated urea; (3) placing a coating around the fertilizer particle which allows the nutrients to move out into the soil very slowly, such as with the Sierra products. The thicker the coating the larger the response; or (4) increasing particle size of a carrier which releases its nitrogen to the soil by dissolving its nitrogen in the soil water. This is the way the nitrogen release in IBDU (isobutylidenediurea) is restricted. The larger particles give slower, but longer response.

Most of these carriers give the most uniform response if applied in at least two applications, usually two-thirds in the spring and one-third in the fall. Heavier rates of nitrogen in the fall have not proven efficient in Michigan because the nitrogen not used in the fall is usually lost by leaching before spring. Those carriers that release nitrogen through microorganism activity would be an exception, but because they are temperature dependent there would not be a ready response during cool spring weather.

The 1973 results to date have been typical. Those carriers with more soluble nitrogen have given the best early response. Some of the slower-releasing carriers gave poor quality turf during late April and May because of cool weather and poor growing conditions. In addition, there has been need of more nitrogen during the spring of 1973 because of greater leaching of nitrogen due to above normal rainfall in fall of 1972 and spring of 1973.

All of the carriers studied possess good slow-release nitrogen properties, although the response rates vary. The turfgrass manager must learn how to use specific nitrogen carriers to provide the response desired under his turfgrass conditions. These studies will be continued to provide information which should be helpful in making these decisions.

Table 19. 1972 East Lansing Nitrogen Carrier Study Quality Ratings. Treatments applied 5/, 6/28, and 8/23. Nitrogen applied at rate of 5 pounds per 1,000 square feet per year. Averages of 3 replications.

Treatment			Turfgrass quality ratings (1=best; 10=poorest)				
Carrier	Source	Time	6/15	7/17	8/23	10/15	Avg.
24-4-8 (IBDU)	Swifts	Apr	1.0	N	1.6	3.6	2.07
24-4-8 (IBDU)	Swifts	Apr, Aug	1.2	o	3.6	2.6	2.47
24-4-8 (IBDU)	Swifts	Apr, June, Aug	1.8		2.8	2.5	2.37
24-4-12 (IBDU	Swifts	Apr	1.3	d	2.3	3.3	2.30
24-4-12 (IBDU	Swifts	Apr, Aug	1.5	i	3.3	2.2	2.33
24-4-12 (IBDU	Swifts	Apr, June, Aug	1.6	f	3.0	2.2	2.27
24-0-12 (IBDU)	Swifts	Apr	1.2	f	2.6	3.6	2.47
24-0-12 (IBDU)	Swifts	Apr, Aug	1.5	e	3.2	2.8	2.50
31-0-0 (IBDU) fine	Swifts	Apr	1.8	r	1.3	2.8	1.97
31-0-0 (IBDU) fine	Swifts	Apr, Aug	1.6	e	2.5	1.8	1.97
31-0-0 (IBDU) coarse	Swifts	Apr	2.0	n	2.3	2.5	2.27
31-0-0 (IBDU) coarse	Swifts	Apr, Aug	2.2	c	2.8	1.8	2.27
S.C. Urea	TVA	Apr	1.2	e	1.0	4.2	2.13
S.C. Urea	TVA	Apr, Aug	1.6	s	2.3	3.3	2.40
19-6-13	Sierra	Apr	1.2		1.2	3.2	1.87
19-6-13	Sierra	Apr, Aug	1.6	o	2.0	2.3	1.97
32-0-8	Scott's	Apr, Aug	1.5	b	3.2	3.5	2.73
30-3-10	Scott's	Apr, Aug	1.5	s	2.8	3.3	2.53
6-3-0	Milorganite	Apr, Aug	1.2	e	3.8	3.5	2.83
38-0-0	Ureaformaldehyde	Apr, Aug	1.6	r	4.3	4.8	3.57
16-7-12	Sierra	Apr, Aug	1.6	v	2.2	3.2	2.33
				e			
				d			