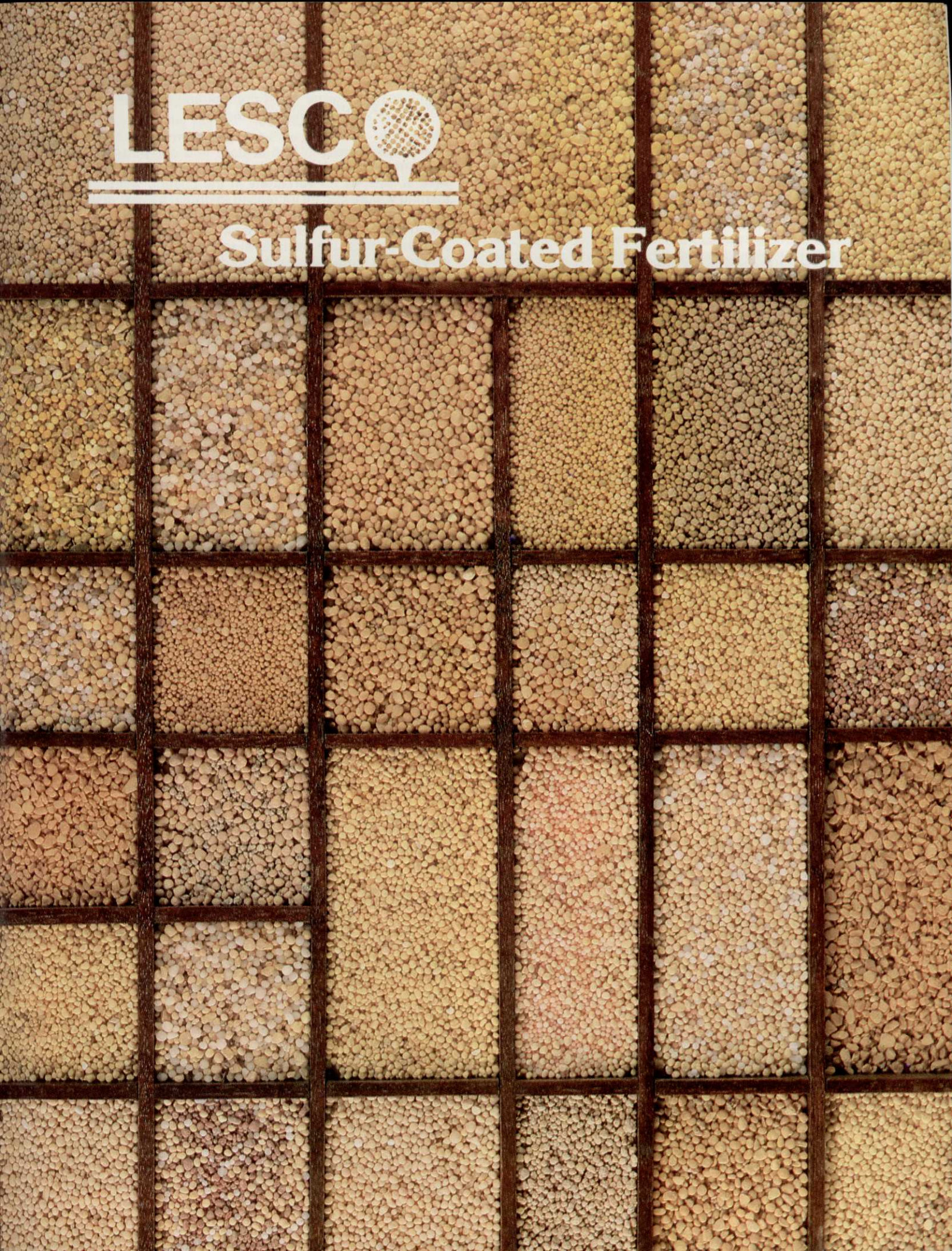


LESCO



Sulfur-Coated Fertilizer



Questions and Answers about **LESCO**

What is **LESCO Sulfur-Coated Fertilizer**?

LESCO Sulfur-Coated Fertilizer is controlled-release fertilizer made by coating nitrogen and other plant nutrients with molten sulfur in varying thicknesses to allow feeding of turf for up to 90 days.

How are nutrients released from sulfur-coated fertilizer?

Nutrients become available when the coating degrades to expose them or when nutrients diffuse through small pores in the coating. If all Sulfur-Coated Fertilizer particles were identical, the release of nutrients would occur at the same time for each particle. Fortunately, coatings are not the same on all particles. Imperfectly coated or cracked particles release nutrients immediately. Particles with thin spots in the coating and with imperfections in the sulfur coat which is covered by sealant have intermediate release rates. The longest delay in release comes from the thicker-coated particles with no imperfections. Thus, it is the variability in the particles that provides a sustained release of nutrients from LESCO Sulfur-Coated Fertilizer.†

SULFUR-COATED UREA

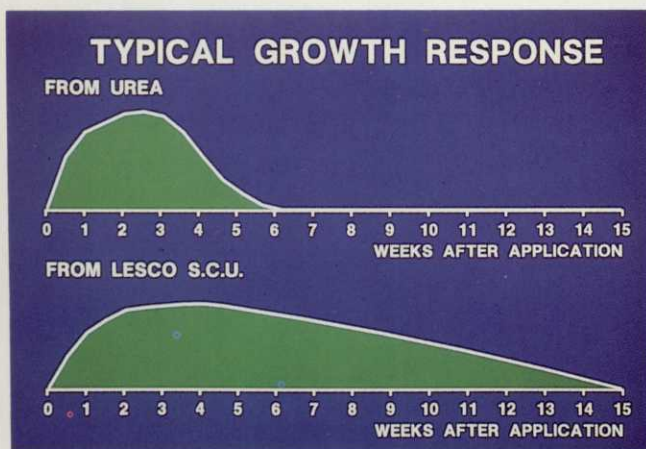
RELEASE BY COATING DEGRADING
OR
DIFFUSION THRU SMALL PORES

• • • • •

IMPERFECTLY COATED - IMMEDIATE RELEASE
THIN COATED - INTERMEDIATE RELEASE
THICKER COATED - LONGEST DELAY

How long will **LESCO Sulfur-Coated Fertilizer** last on turf areas?

The duration of feeding of Sulfur-Coated Fertilizer depends on the dissolution rate of the product. Half of the nutrients are released in the first month, the remaining 50% is released over the next two months.



Why do different sulfur-coated products have different nitrogen contents?

The N content of LESCO Sulfur-Coated Urea products falls within the 36 to 37% range; urea has 46% N. Addition of the

sulfur coating lowers the N content and because coating weights vary, N contents also vary.

The weight of applied sulfur ranges from 15 to 18% of the final product weight. The sealant and conditioner each account for about two percent of the final weight. There are several reasons for variations in the coating weight. The coating weight can be increased to obtain a lower dissolution rate. Particle size affects the amount of coating required to obtain a certain dissolution rate. As the particle size decreases, the surface area per unit of weight increases and more sulfur is required to achieve a coating of a given thickness.

What factors influence release of nitrogen from Sulfur-Coated Fertilizers?

As coating thickness increases and the dissolution rate decreases, release of nutrients will be slower. As temperature increases, release rate increases. Release rate is not greatly affected by soil water, soil pH or microbial activity.†

What is dissolution rate?

The seven-day dissolution rate is a laboratory measurement of the percentage of nutrients that go into solution when a sample of Sulfur-Coated Fertilizer is placed in 100°F water for seven days. It is used to indicate the relative rate of nutrient release from Sulfur-Coated Fertilizer. As coating thickness increases, the dissolution rate decreases.†

Is granule coating breakage a problem with Sulfur-Coated Fertilizers?

Research has been conducted to examine the effect of traffic on Sulfur-Coated Fertilizer granules. After mower traffic three times a week granule breakage was measured by weekly clipping yield, color rating and residual granule count. With Tennessee Valley Authority process sulfur-coated urea, the same process Lakeshore uses for its sulfur-coated urea, no effect from traffic was reported over a two-year period. No granule breakage has been reported with the use of rotary spreaders (LESCO or Lely spreaders) which have a spinner speed of approximately 300 rpm.



How does the efficiency of **LESCO Sulfur-Coated Fertilizer** compare with other N sources?

When measuring the amount of applied nitrogen taken up by plants over a three-year period, Sulfur-Coated Fertilizer

Sulfur-Coated Fertilizers

proved to be as efficient as soluble N sources and more efficient than other popular slow-release N sources.

Nitrogen source	Nitrogen recovery In clippings as % of applied N
Ammonium sulfate	48% a*
10-6-4 (soluble-N)	50% a
TVA SCU•	51% a
Coarse IBDU	37% c
Methylene urea	42% bc
Milorganite	29% d
Ureaform	22% e

*Values followed by the same letter are not significantly different.
•LESCO Sulfur-Coated Fertilizer is manufactured using the TVA process.

What sizes of LESCO Sulfur-Coated Fertilizer are available?

LESCO produces two sizes of Sulfur-Coated Fertilizer. LESCO 7 mesh grades are designed for use on turf mowed 1/2" or above. LESCO standard grade is for use on turf cut above 1" in height. LESCO Sulfur-Coated Fertilizers are not designed for use on established golf course greens or for cut under 1/2" in height. For cut under this height, we recommend LESCO Greens and Tees Fertilizers

What are the advantages of using Sulfur-Coated Fertilizer over using urea or other N sources?

LESCO Sulfur-Coated Fertilizers last longer so fewer applications are needed to maintain uniform quality turf. Use of LESCO Sulfur-Coated Fertilizer reduces the problem of fertilizer burn and reduces the loss of nitrogen by leaching and volatilization. If losses are appreciably decreased, greater efficiency may be achieved with Sulfur-Coated Fertilizer than with a soluble source. The decreased labor costs and greater efficiency as well as the smaller amount of nutrient loss usually more than make up for the greater cost of sulfur-coated fertilizer.

What are the advantages of using LESCO Sulfur-Coated Fertilizer over other slow-release nitrogen sources?

With LESCO Sulfur-Coated Fertilizer, the lower cost of nitrogen and the greater efficiency of applied nitrogen give sulfur-coated fertilizer the advantage over other slow-release sources. Response from sulfur-coated fertilizer is also quicker and more intense than response from other slow-release sources.†

Is the sulfur in LESCO Sulfur-Coated Fertilizer available to turfgrass?

Yes, the sulfur is available after it is oxidized to the sulfate form. The oxidization from sulfur-coated fertilizers is between the fairly rapid oxidization of sulfur from powdered sulfur and the slow oxidization from granular sulfur.†

Does LESCO Sulfur-Coated Fertilizer reduce soil pH?

The potential for increasing soil acidity exists in most nitrogen sources. Urea has a potential acidity, as do ammonium salts and the natural and synthetic organics. The concern about sulfur-coated fertilizers is usually in reference to the sulfur coating since sulfur is sometimes used to acidify soils. No striking effects of sulfur were found after four years of tests at The Pennsylvania State University. Other research indicates similar results. Still, the potential for acidifying the soil is there; and, as sulfur is oxidized to sulfate by S-oxidizing bacteria, hydrogen is released to make the soil more acid. If soils become too acid with concentrated use of sulfur-coated fertilizers, or any N source, the solution to the problem is the same: lime according to soil test recommendations. After four years of using different nitrogen sources, PSU obtained the following results in soil samples taken from the surface two inches. (No differences occurred at two to four inches. The greatest lowering of pH occurred with ammonium sulfate. The difference in soil levels of sulfate-S were reflected in the uptake of S.†

Nitrogen source	Soil pH	ppm Sulfate-S† in soil
Ammonium sulfate	5.5 b*	10.9 a*
16-8-8 (50% ureaform)	6.2 a	6.4 bc
10-5-5 (75% ureaform)	6.4 a	6.0 c
Milorganite	6.3 a	7.7 bc
16-8-8 (50% SCU (21% dis. rate))	6.2 a	8.9 ab

*Values followed by the same letter are not significantly different.

Why should I use LESCO Sulfur-Coated Fertilizer on my turf?

1. Because more of the nitrogen in LESCO SCF is available as a nutrient to the plant;
2. Because LESCO SCF resists leaching;
3. Because LESCO SCF tolerates changes in temperature and moisture better than other slow-release forms;
4. Because you avoid the risk of fertilizer burn associated with heavy applications of conventional fertilizers;
5. Because LESCO SCF is a concentrated product so you reduce handling, space and transportation costs;
6. Because LESCO SCF minimizes surge growth;
7. Because LESCO SCF is not dependent on bacterial breakdown;
8. Because LESCO SCF provides controlled-release feeding of turfgrass for 90 days;
9. Because the sulfur in LESCO SCF is available as a plant nutrient;
10. Because on turfgrass and research plots across the United States, Sulfur-Coated Fertilizer has outperformed other conventional and slow-release products in appearance, growth and nitrogen recovery.

†Taken all or in part from "Answers to Questions" about Sulfur-Coated Urea, V. Waddington and N. W. Hummel, Department of Agronomy, The Pennsylvania State University, in Grounds Maintenance Golf Course Manual.

