

Nitrogen: Symbol, N. A colorless, tasteless, odorless inert gas, constituting by volume 78.03% of the atmosphere. It is a constituent of all living tissues found in greatest concentration in young growing parts, in leaves and seeds. Without N, growth is impossible.

The Nitrogen Cycle: (1) Fixation of N in air by organisms or by manufacturing; (2) Absorption by plants; (3) Conversion to plant tissue; (4) Utilization by animals or decomposition by organisms; (5) Reconversion to forms suitable for plant growth, loss by leaching or erosion, or escape into air in gaseous form.

Fertilizer N may be found in nature (sodium nitrate, Chile), accumulated as plant or animal by-products (seed meals, tankage, sludges, manures), or manufactured (urea, ureaform, nitrates, sulfates).

N for turf may be soluble (urea, nitrates, sulfates) or insoluble (ureaform, sludge, tankage). Solubles feed plants directly and rapidly. Insolubles feed soil organisms first. These, in turn, supply N to plants more slowly.

Conversion of complex N compounds in soil is by way of 1) ammonia, 2) nitrite, 3) nitrate. Nitrates combine with Ca and Mg and enter plant roots in solution. Many plants can use ammonium ions directly.

N tends to increase topgrowth, green color and to delay maturity. Excess of soluble N tends to increase some turf diseases. Insoluble N forms are safer even in large quantities.

Nitrogen is a part of an intricate complex chemical and biological system which is sensitive to environmental conditions. N serves turf best when soil bacteria are favored by good drainage, optimum soil aeration, pH range near neutral (7.0), ample energy supply (carbon), and all other nutrients in balance.

By all means use dolomitic limestone liberally. A soil test should be made. A pH value of around 7.0 is desirable.

You do not need to remove anything that has been planted. Fertilize as directed in the circular. Then, according to your choice, sow freshly-inoculated seed or plant crowns (living roots). If you don't see results soon don't become discouraged. New crownvetch growth is not easily recognized and, besides, it is very slow in getting started. It develops an extensive root system first — then the tops begin to develop. You will find that PENNGIFT crownvetch gradually will take over the other plants, weeds, included, until there is a solid erosion-control groundcover.

Zebra Grass

Q. We want information regarding Zebra grass. (See page 44, GOLFDOM, Feb., 1964.)

A. We answered this question by saying we have not found information on it. Now comes Dr. Felix Juska, USDA, Beltsville, Md., who called to say that Zebra grass is *Miscanthus sinensis* often mis-named "eulalia". The 1948 Yearbook of Agriculture (p. 734) named this grass, "Chinese silvergrass", said nothing about "Zebra grass".

It is a reedy, bunch-type, semi-tropical, ornamental grass 4 to 6 feet high, with leaves cross

banded. These are two varieties in the U.S. Both are vegetatively propagated. When mature it has plumes similar to pampasgrass.

Hungry for Nitrogen

Q. We have had a problem with our greens for the last two summers. We have dollarspot and nothing seems to help it much. I spray one chemical on Monday and another on Friday. Sometimes I mix them but my only relief comes when I use twice as much as recommended. I tried hydrated lime at 3 lbs./M² back in the fall and it seemed to help some. What do you suggest? (Virginia)

A. Naturally I should know more about your greens such as 1) kind of grass 2) fertilizing program 3) irrigation. Also I would like to see a soil profile to check on thatch and mat.

Based on past experience these are distinct possibilities:

1. The light touch of lime helped because it probably stimulated soil bacteria which released some nutrients which, in turn, helped the grass to recover. I suspect that your grass is hungry for nitrogen. Well fed grass rarely develops dollarspot. Since you told me nothing about your fertilizing program it is difficult to make a valid suggestion. Also, some grasses are more susceptible to dollarspot than others.

(Continued on page 157)

compaction. The improved uniformity of profile wetting eliminates localized dry spots and promotes deep rooting. The increased availability of soil moisture and nutrients decreases the frequency of irrigation, improves the efficiency of water and nutrient use and saves an estimated 30 per cent in water and labor.

To Describe Meusel's Work

Next month we'll describe work done at Yale University by Harry Meusel. This work shows the effects that soil wetting agents, watering practices, and fertilizers have on the wilting, appearance, internal cell structure, and stomatal openings of *poa annua*.

This article is condensed from a speech made by Bob Moore at the recent Midwest Regional turf conference held at Purdue University.

Grau's Answers

(Continued from page 35)

2. You may have more thatch and mat than you need. Disease organisms are protected from fungicides by the excess material. The double dose gave temporary relief by partly penetrating the dead material. Regular aerating and vertical mowing are needed to reduce excess grass, living and dead. Also you need active soil organisms to break down the mat as it accumulates.

3. Your soil may be acid which is encouraging to disease fungi. The lime raised the pH level temporarily and thus checked the growth of the organisms. No recommendations can be made until you have soil tests made. If you would send a copy to me I shall be glad to review it and offer suggestions. Your experiment station at V.P.I. will run the test and make recommendations.

P.S. Thank you for sending the additional information and profile slice so promptly that I could add these remarks:

Your Arlington bent has serious excess felt-mat accumulation which must be decomposed chemically and biologically. The grass is starved for nitrogen and is seriously overwatered. It is recommended that the greens be watered from 9 to midnight every second night instead of 9 p.m. to 6 a.m. every night. Add dolomitic limestone to the topdressing, one 80-lb. bag to 1 cu. yd. When you spray insoluble nitrogen on the greens add sulfate of potash, hydrated lime and ferrous sulfate (all as directed). Core the greens spring and fall and remove cores. While holes are open, rinse fertilizer deeply into holes. Microorganisms will benefit from less water, added lime, better aeration, and a supply of food and energy, enabling them to hasten decomposition of the mat.

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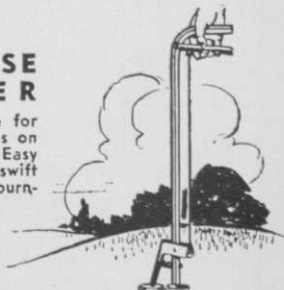
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