by the plant. The excess is removed in the clippings.

Recommends Straight Materials

The troubles of the present help us to plan a more trouble-free future. We share the belief that professional managers of turf will come closer to providing a more perfect balance of nutrients by using straight materials. In this way each nutrient element can be supplied in the proper quantity at the best time. Excesses largely will be a thing of the past.

Many supts. have directed justified criticism against granular materials which tend to lie on top of the turf on putting greens. In this position much material is picked up by mowers and wasted. Some of it has caused severe burning. The greatest sin is that the particles lying *on* the turf do not contribute much to nutrition. They may even tend to attract roots to the surface and help to develop more thatch and mat. Material on the surface may be washed into low places where excess accumulation tends to create serious troubles.

In summarizing the total situation we are forced to recognize that Nature has shown us the weaknesses in our systems.

Nurseries Still Needed

Many of the nurseries we have urged clubs to build are just now being planned. It is like locking the stable door too late, but, we will have other winters like the one just past.

The sturdy dependable creeping bents in the trouble areas are Washington, Old Orchard and Toronto. Cohansey is looking better all the time. But, be sure you get the real McCoy in any stolon bent.

Drainage (surface, internal and sub) is of prime importance, the critical factor in severe seasons.

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Fairway Fertilization

Q. Our course is now in the process of a complete fairway fertilization program. We recently purchased several thousand lbs. of chemical fertilizer and the constituents of this fertilizer consist of the following: 21 per cent nitrogen, 24 per cent combined sulphur and 55 per cent inert materials. The trade name of this fertilizer is "Sulfate of Ammonia."

As there are no agronomists in our immediate area, we would appreciate it very much if you would answer the following questions realtive to our program and also advise us as to the desirability of this type of fertilizer. Our main problems are as follows:

1. Will this type of fertilizer alleviate in any way our serious clover problem?

2. Should we aerify our fairways, which has not been done for 10 years, prior to the applica-

tion of the fertilizer, or should we put the fertilizer on and then aerify?

3. What would be the best month to start the program?

4. Should we have a soil analysis taken of our fairways?

5. Should this type of fertilizer require a surplus of water to prevent burning? (Montana)

A. Sulfate of ammonia is a well-known chemical nitrogen fertilizer material. It furnishes nitrogen quite inexpensively compared to most nitrogen materials initially, but has the big disadvantage of leaching out of the soil (up to 70 per cent) and burning the grass severely. Properly used, lightly and frequently, sulfate can help to alleviate a clover problem, but the labor cost of the frequent applications nullifies the advantage of the original low cost.

Fairways may be aerified any time they need it. Chances are good that, if your bluegrass fairways have not been aerified for 10 years, it would do them a lot of good to be thoroughly cultivated prior to the application of fertilizer. Since the sulfate of ammonia is completely soluble, it really doesn't make a great deal of difference whether you fertilize first and then aerify, or whether you aerify first and then fertilize. If the water will penetrate into the soil at all, it will carry the soluble sulfate with it.

It makes little difference when you start your program — I would say the sooner the better. The time to apply sulfate, of course, is during the growing season.

Soil analyses represent the inventory of your assets. It is well to have soil analyses made once a year in order to check on the conditions of the soil pH and levels of calcium, phosphate and potash.

If the sulfate is applied when the grass is very dry and the spreader is working well so that the distribution is perfectly uniform, your chances of burning are minimized. However, sulfate, applied late in the afternoon, can draw enough moisture from the air during the night to cause severe burning. The burning will be accentuated if there is any traffic or foot-printing. It certainly helps to wash the sulfate in with water to minimize burning.

As I recall, your fairways are made up mostly of Kentucky bluegrass. Recently, in conversation with experiment station personnel, it was developed that the leafspot disease of Kentucky bluegrass appears to be accentuated by the use of inorganic nitrogen fertilizers. Some of your clover problem quite likely could be the result of leafspot infection and consequent weakening of the turf, which would allow the clover to invade. It is entirely possible that this situation may be accentuated by the soluble, quickly-available fertilizer.

Usually, in planning a complete fertilizer program, the soil analyses are made first and then the fertilizer is purchased on the basis of the interpretation of the analyses so that the grass will receive proper balanced nutrition. May I suggest that, when you have your state experiment station run the soil analyses, I will be happy to review a copy of the test results and help you interpret them.