

are released and restored to the soil in forms which the grass can use. Plant food losses are confined to nitrogen.

Iron Chlorosis on Increase

The growing season in Wisconsin is five to six months. Clippings have been weighed and analyzed from one green at Brynwood. During the season the dry weight of clippings from each 1,000 square feet was 100 pounds in round numbers. Where the growing season is longer, the amounts would be proportionately more. The clippings contained about 5 pounds of nitrogen, 2 pounds phosphoric acid, and 4 pounds of potash. The plant food removed during the season was equivalent to a 100-pound bag of 5-2-4 fertilizer. It is significant that there is almost as much potash as nitrogen, and only half as much phosphoric acid. This 5-2-4 ratio is vastly different than 5-10-5, 4-12-4, etc., which have been used in the past. No wonder many greens are becoming low grade phosphate mines and iron chlorosis is on the increase.

Based on the Brynwood findings, bent greens should receive about 1 pound nitrogen, $\frac{1}{2}$ pound phosphoric acid, and $\frac{3}{4}$ pound of potash each month per 1,000 square feet of surface to replenish the amounts removed in the clippings.

The easy way is to apply the potash and phosphate all in the late fall or to

apply one-half in the spring and one-half in the fall. Both are taken up by the soil so they resist leaching. Then use from 1 to 2 pounds of nitrogen per 1,000 square feet per month. The other alternative is to make monthly or semi-monthly applications of all three — nitrogen, phosphoric acid, and potash. When this is done, the fertilizer ratio should be something like 1-1-1 or 2-1-2, rather than 1-2-1 or 1-3-1.

Iron chlorosis is becoming more common. It was responsible for many bad greens during the summer of 1954. Most of these greens could have been saved by prompt use of copperas which is ferrous sulphate. The secret is to use 2 to 3 ounces per 1,000 square feet with not more than 5 gallons of water. The iron sulphate must be left on the leaf. At least 4 to 5 hours should elapse after spraying with iron sulphate before it is watered-in, or before the green is watered. Promptness is important, otherwise the weakened grass will fall prey to one of the many fungus diseases.

It is only natural that discussions of disease emphasize fungicides and their use. However, the role of management cannot be ignored. Fertilizer and water practice are the things which have profound effects on disease and the effectiveness of fungicides.



"KIDS' DISEASE" RUINS GREENS

One of the worst cases of juvenile vandalism was the case in the Michigan and Border Cities district. Lame-brained kids drove a car over nine greens with results shown above.

Repairs were made by constructing a device which removed damaged strips to uniform width and depth, and which cut replacement sods from green borders and nurseries. Despite superintendent's ingenuity, heavy expense and time beyond value are required to repair the destruction.