More Clubs Turn to Soil Tests in Northwest Region

Look for element ratio that gives quality turf and restricts disease

BY ROY L. GOSS Agronomist, Western Washington Experiment Station

A well fed turf is the only type that can stand up under the increased playing pressures such as we are experiencing today. We sometimes find cases of under-fertilization in the Pacific Northwest, but for the most part, supts. are aware of the need for good fertilization programs. Fortunately, most budgets will allow ample funds for fertilization, particularly for the putting greens and tees. One of the biggest problems facing us is that of proper ratios.

Are we widening the ratios too much between some of the major plant food elements? In our own research program at the Western Washington experiment station at Puyallup, we have found that as much as 20 pounds of nitrogen per 1000 square feet per season, gives little or no stimulation to turfgrasses when the phosphorus level is maintained at 4 pounds of available P_2O_5 per 1000 square feet per season. However, by using the same phosphorus level and reducing the nitrogen application to 12 pounds per 1000 square feet per season, excellent growth responses are obtained.

Regular Soil Tests

Soil tests are the only reliable means for determining fertility needs, particularly of phosphorus, potassium, calcium, and the minor elements. Little use was made of soil tests by many of the golf courses in

This article is condensed from a speech made by Goss at the 1963 GCSA National Convention in San Diego. the Pacific Northwest prior to 1955. Now, most of these courses have regular schedules for testing their soils. According to records which we have available, nine out of ten golf courses, between 1955 and 1960 had potassium deficiencies. This, I believe, can readily be explained by the sandy nature of putting green soils, allowing potassium to be leached.

There is more evidence of potassium deficiency in putting greens west of the Cascade Mountains than in the eastern areas. This is due not only to more water passing through the soil profile, but also to lighter soils being used in these heavy rainfall areas. By accelerating the potash application program and incorporating more potash into formula fertilizers, these deficiencies have been overcome for the most part. There has been a concurrent increase in turfgrass density, vigor, and appearance with increased potash availability.

More Disease Susceptibility

The increased use of fertilizers has improved not only the quality of the turf-



Roy L. Goss

grasses all over the Northwest, but it has also rendered them more susceptible to certain diseases. Long standing observations have indicated that the amount of snowmold (*Typhula*) in eastern areas and Fusarium patch in western areas, has increased in the last few years, and perhaps a lot of this can be attributed to increased fertilizer usage. Cooperative studies with C. J. Gould have shown that increased fertilization with nitrogen causes increased (*Continued on page* 73)

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susceptibility to some pathogens. Also, it has been found that the source of nitrogen becomes increasingly important with the development of the Fusarium patch disease in the western areas. It has been shown that the organic sources of nitrogen, including the synthetic organic urea, greatly increased the amount of disease.

Year-Around Threat

Disease occurrence is one of the most serious problems facing us in the Northwest. Fusarium patch and red thread find ideal weather conditions west of the Cascade Mountains. Supts. must exercise extreme caution and vigilance during the periods of Aug. 15 through Nov. 15, and again in February and extending on into early summer. In other words, Fusarium patch can cause extensive injury at almost any season of the year. The control of this disease has been extensively investigated by C. J. Gould and associates and recommendations for its control are firmly established.

Snow mold is probably the most serious disease of putting turf in areas east of the Cascades. This disease is not so much of a problem when fungicidal applications (mercurial fungicides) are made just prior to snowfall in the fall and winter. Season long protection can be gained with only two or three applications of these fungicides, provided the timing is good.

Ophiobolus patch has recently been found on turf in the Pacific Northwest and may be causing considerable damage, particularly on fairways. This disease has the potential of causing extensive damage since the areas affected are quite large and the plants are completely killed. Investigations are currently underway to find a control for this disease.

Weed Control Problems

A few years ago mouse-eared chickweed, white clover, and English lawn daisy were virtually uncontrollable with chemicals. Today, little difficulty is encountered in controlling them with the herbicide, Silvex. Silvex also does an exceptionally good job in the control of Japanese clover, buttercup, and several other common turf weeds. New herbicide tests are continually being conducted in order to find herbicides that will be as effective as Silvex without the drift and toxicity problems presented by it.



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Poa rears its ugly head once again. Numerous attempts have been made to control this weed in turfgrass stands, but most of them have ended in failure. Even massive doses of the arsenicals have failed to give or maintain any satisfactory control in putting greens in the Pacific Northwest. About the only thing arsenic has done is create a toxic condition that has practically eliminated the possibility of re-establishing bentgrass seedlings in treated soils. Obviously, we are going to have to find something better than arsenic to control this weed. Current investigations with the pre-emergence herbicides are showing considerable promise and shall be investigated further.

Crabgrass is a serious weed in the areas east of the Cascades, but with the advent of such materials as Dacthal, Zytron, and other pre-emergence herbicides, it no longer poses a problem to the good managers.

Velvetgrass is, however, still a headache in the Pacific Northwest. Fortunately, the amount of velvetgrass in most of our putting greens is fairly low. This is indeed fortunate, since it appears that controls for this weed will not be developed in the immediate future.

A few summary statements may indicate what we are doing in research on our Pacific Northwest problems. Experiments are currently being conducted in the following areas:

1. Compaction — Testing various soil mixtures and compacting them with an experimental compaction machine.

2. Bentgrass Maintenance Experiments

a. Pre-emergence control of poa annua;

b. Selection of new bentgrass varieties; c. Testing techniques to promote better

root growth.

3. Fertility experiments which include ratios, levels, sources, and timing.

4. Weed control experiments on annual bluegrass, English lawn daisy, speedwell, velvetgrass, and algae.

5. Disease Investigations — Cooperative studies between pathology and agronomy:

a. Fusarium patch

b. Red thread ...

c. Ophiobolus patch

Virginia Polytechnic Institute will hold its annual field day Sept. 4 in Blacksburg, Va., according to R. E. Schmidt, assistant professor of agronomy at VPI. The fourth annual Virginia turf conference is scheduled for Jan. 14-15, 1964, in the John Marshal Hotel, Richmond.