WHAT OTHERS WRITE ON TURF

In this department will be given the substance of research in the various fields of scientific investigation which seems to have a definite bearing on turf improvement. The articles will summarize results of recent investigations made in various parts of the world. They are not published here as recommendations but simply as information for our readers and as suggestions which may have practical applications in many situations. Where the Green Section's tests or the information it has obtained from other reliable sources in this country substantiates or contradicts the results obtained by other investigators, comments to that effect may be included as a guide for our readers. In all other cases the reader will receive in brief the results and conclusions as given in the original papers.

LATE FERTILIZING AND SUSCEPTIBILITY OF KENTUCKY BLUEGRASS TO COLD

Numerous experiments have shown that fall is usually the best time to fertilize turf. There are even indications that in some sections fertilizers may advantageously be applied during winter. J. C. Carroll and F. A. Welton, of the Ohio Agricultural Experiment Station, have raised the question of whether the readily available nitrogenous fertilizers applied late in fall made the grass more susceptible to cold. They have investigated this point and have reported their work in Plant Physiology. The results appear to support their contention that grass heavily fertilized in late fall with a readily available source of nitrogen is not able to endure the same degree of cold as unfertilized grass.

Turf for the experiments was grown both in the open and in the greenhouse. Nitrogen was applied to one series of fertilized plots in the open at the rate of 2.5 pounds to 1,000 square feet, at three intervals from April to October, making a total of 7.5 pounds to 1,000 square feet each season. Another area was treated with sulfate of ammonia at the same rate of nitrogen on September 10 and October 12. The greenhouse plantings were made in subirrigated jars and the fertilized jars received three applications of sulfate of ammonia at the rate of 2.5 pounds of nitrogen to 1,000 square feet at each application.

Artificial refrigeration was employed to test the resistance of the grass to cold. Before being placed in the refrigerator the greenhouse grown grass was hardened by being kept at 32° F. for 12 hours. The grass grown in the open was lifted after being hardened naturally.

The hardened greenhouse samples were subjected to different low air temperatures for 8 hours and the percentage of survival noted after 2 weeks. Temperatures used varied from 10° F. to 0° F. At 10° F. 50 percent of the fertilized grass was killed while the unfertilized grass showed little injury. Damage was progressively greater at lower temperatures, and when exposed for 8 hours to 0° F. all of the fertilized and 90 percent of the unfertilized grass was killed.

The field grown samples were lifted at four dates from October 20 to December 1 and subjected to an air temperature of −13° F. for from 2 to 5¼ hours. Determination of the percentage of survival made later showed that in every case the fertilized grass was more readily killed than the unfertilized grass. For example, when the grass was lifted December 1 and exposed for 3 hours to −13° F., the unfertilized grass survived 100 percent, the fertilized only 45 percent. An exposure of 4 hours resulted in the death of 20 percent of the unfertilized grass and 90 percent of the fertilized. This 4-hour exposure lowered the soil temperature to 16° F. An exposure of 5 hours lowered the soil temperature to 9° F. and resulted in the death of 95 percent of the fertilized and 60 percent of the unfertilized grass.

The conclusion is drawn that heavy and late applications of nitrogenous fertilizers may be expected to lessen the resistance of Kentucky bluegrass to cold.

Although these workers have demonstrated a lack of cold resistance in heavily fertilized Kentucky bluegrass under the experimental conditions described it seems doubtful that such results would follow common practice in fertilizing turf. In the experiments described 7.5 pounds of nitrogen were applied to 1,000 square feet during the season, and in one case 5 pounds were applied in late fall. These rates are equivalent to applications of about 1,600 and 1,100 pounds of sulfate of ammonia to an acre respectively. In fertilizer trials on bluegrass fairways in Canada no killing due to low temperatures has been observed when fertilizer was applied at the usual rate.

Field observations on the susceptibility of fertilized bluegrass to low temperatures are complicated by the fact that late fertilized grass is especially susceptible to snowmold. Much of the so-called winter killing of late fertilized bluegrass may be due to this disease rather than to low temperatures.

Kentucky bluegrass occurs naturally over most of North America. Under field conditions in Minnesota, soil temperatures as low as –4° F. for considerable periods have been reported at a depth of 2 inches under the sod. While no actual counts have been made under such conditions observations in the spring have not indicated any difference in the density of moderately fertilized turf due to cold. It would seem, therefore, that the work here reported does not justify a fear that harm will result from low temperatures when turf is moderately fertilized in fall.

WILL WAR AFFECT OUR FERTILIZER SUPPLIES?

Our supply of fertilizers was seriously reduced when the World War cut off some of our importations in 1914. Therefore the question naturally arises, "What effect may the present European war have on fertilizer prices in this country?" According to an editorial in the Fertilizer Review there is apparently no danger of a shortage, nor is there a likelihood of any extreme price increase, as America is in a much better position with reference to fertilizer materials than it was in 1914. The editorial states:

"Then we were almost entirely dependent on Germany for potash and on Chile for nitrates. Then the production of war munitions interfered with the manufacture of superphosphate because sulphuric acid was necessary in large quantities for the manufacture of explosives. Supplies of all three major plant foods—nitrogen, phosphoric acid, and potash—were seriously affected then by war needs or conditions.

"Today we find our own country producing in peace time nearly two-thirds of our potash consumption, with ability, if emergency conditions make it necessary, to produce from our California and New Mexico sources all the potash we need. In addition, France, Spain, Palestine, and Russia are all producing potash, a part of which will no doubt find its way here.

"Chile is no longer the only source of nitrates for plant food and powder. Synthetic processes for the fixation of nitrogen from the air, developed during and after the World War, include the domestic manufacture of nitrate of soda and nitrate of ammonia for agriculture, and nitric acid and its derivatives for explosives. Nitric acid is produced without the use of either nitrate of soda or sulphuric acid so that these materials are released for fertilizer use. Sizeable stocks of nitrate of soda