

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.

GERMINATION OF CARPET GRASS SEED

E. H. Toole and V. K. Toole of the United States Department of Agriculture reported in the Journal of the American Society of Agronomy the results of their studies on the germination of carpet grass seed under laboratory conditions. Fresh seed was found to germinate about 90 percent. The same seed after being stored in the laboratory for 3 years germinated 81 percent. On the contrary, seed which had been stored for 1 year in a warehouse in the region of production in Mississippi showed only 67 percent germination at the end of the first year, 53 percent after the second year, and only 5 percent at the end of the fourth year. These figures would seem to indicate that the conditions under which carpet grass seed

is stored profoundly influence the ability of that seed to germinate.

Several temperatures were tried in order to find the best temperature at which carpet grass seed will germinate. The best results were obtained with an alternating temperature of 68° F. for 17 hours and 95° for the remaining 7 hours.

MILKY DISEASE OF JAPANESE BEETLE GRUB

Milky diseases A and B of grubs of the Japanese beetle are caused by bacteria which grow and produce spores in large numbers in the blood of living grubs. It is the spores which give the blood of living grubs its characteristic milky appearance. As many as 20 billion spores have been found in the blood of a single grub. In recent issues of the Journal of Economic Entomology, Ralph T.

White and S. R. Dutky of the Bureau of Entomology and Plant Quarantine of the United States Department of Agriculture have described experiments demonstrating the possibility of using these bacteria to control the grubs in turf.

Grubs are inoculated with the bacteria and then incubated in soil kept at a temperature of 86° F. for 10 to 12 days, at the end of which time the grubs each contain between 1 and 3 billion spores, depending on the number of bacteria with which they were inoculated. These diseased grubs are then used to inoculate the turfed areas in which the grubs are to be controlled. When they are to be used immediately, the diseased grubs usually are ground and the resulting material suspended in water. If it is to be stored for future use, the ground material is mixed with talc and dried. The prepared infectious material is introduced into the soil in localized spots or distributed over the entire area by spraying the dilute suspension of spores in water or by mixing the talc preparation with enough sand or sieved soil to give sufficient bulk to spread like fertilizer. In some cases living inoculated grubs have been introduced on the plots, and even infected soil has been successfully used for inoculation purposes.

Dosages of 25 to 1,500 million spores per square foot of turf have resulted in a reduction of healthy grubs to the point where no serious injury to turf has occurred.

The writers cite an experiment at Cape Charles, Virginia, in which the grub population was reduced from an average of 121 to 6 healthy grubs to a square foot during the period from July to September, 1939, whereas in the untreated areas 74 healthy grubs to a square foot were present at the end of that period.

The spores have been shown to be resistant to extreme cold as well as to excessive moisture or drought and consequently remain living in the soil in spite of most adverse conditions. To quote from Mr. White's article, "Data indicate that when once the soil becomes highly infectious with the causal agent, no substantial population of Japanese beetle larvae can exist. Serious turf injury can thus be reduced, if not entirely prevented, by the introduction of the causal agent of type A milky disease. A rapid build-up and spread of the organism may be expected when a reasonably heavy larval population occurs."

Experimental results apparently indicate that it should be possible to prevent severe turf injury from the Japanese beetle grubs by introducing

the bacteria into the soil before the Japanese beetle arrives, or shortly after it has reached a given area and before numbers of grubs sufficient to cause severe turf injury have become established.

The Bureau of Entomology and Plant Quarantine, however, emphasizes the fact that this method of controlling the Japanese beetle is still in its early experimental stages. The material is being used only by the Department of Agriculture cooperating with official State agencies in this work. No material is available for general use at this time.

HARVESTING BUFFALO GRASS SEED

Buffalo grass is an important grass in the dry regions of the United States, but seed has been difficult to obtain. The seeds are borne on very short stalks, so that they cannot be reached by mowers, and hand gathering is too costly.

H. O. Hill of Texas has recently described in the *Journal of the American Society of Agronomy* a machine by which a man can collect about 1 pound of seed an hour. The cutter bar and the roller are removed from an ordinary lawn mower and a grass catcher is attached. A canvas shield is fixed over the lawn mower and the shield extends well up the handle bar. The rotating cutter

blades then clip the seeds and beat them back into the catcher or against the shield, which in turn deflects them into the catcher.

The removal of the cutter bar reduces the amount of grass hay caught along with the seed, so that all but the finer particles of trash can be quickly removed by hand. The dirt can be removed by floating the seed out in a tub of water. This cleaning is not necessary when the collector himself is to use the seed.

SEED FORMATION IN KENTUCKY BLUESGRASS

In the April, 1939, issue of *TURF CULTURE*, page 144, investigations were reported which indicated that in Sweden the formation of seed without fertilization was found to be common in Kentucky bluegrass. E. Akerberg, whose work was mentioned in connection with that report, has since published in *Hereditas* a more detailed account of his work with Kentucky bluegrass.

According to him, it is possible to determine whether seed was set apomictically (without fertilization) or sexually (as a result of fertilization) by examining the progeny resulting from seed set in a single panicle. When the resulting seedlings exhibit a constancy in characteristics and