times the surface area of those of rye. His study showed one reason why Kentucky bluegrass is so much more effective in holding soil than rye or oats.

TEMPERATURE OF GERMINATION OF CRABGRASS

E. H. Toole and Vivian K. Toole, of the United States Department of Agriculture, recently presented before the Physiological Section of the Botanical Society of America a paper covering the results of their study of the relation of temperature to the germination of crabgrass seed.

Seed of the smooth crabgrass, *Digitaria ischaemum*, germinated more rapidly under alternating high temperatures of 68° to 100° F. and progressively slower at temperatures of 68° to 95° F., 68° to 86° F., and 59° to 77° F. While the common crabgrass, *Digitaria sanguinalis*, also required alternating high temperatures, the rate of germination decreased as the upper temperature limit was raised but was also lowest at 59° to 77° F.

When chilled at 38° F. seed of both species germinated more quickly. The period of chilling required was shorter when the seed was put out to germinate at the most favorable temperature than at other temperatures.

GERMINATION OF CANADA BLUEGRASS SEED

The testing of seed has been pretty much perfected, but there are still seeds that require special treatment to bring out the best germination. One of these seems to be Canada bluegrass (*Poa compressa*). In some studies made by Alice Anderson at the Seed Laboratory in Washington and published in the Proceedings of the International Seed Testing Association, it was found that seed kept for 17 hours at 68° F. in alternating light and darkness, and for 7 hours at 86° F. in the dark, gave a higher percentage of germination than seed kept under other conditions. It is recognized that the factors controlling the germination of this seed are not well understood.

RESEARCH WORK IN VICTORIA, AUSTRALIA

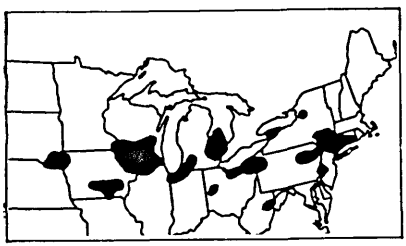
The Victoria (Australia) Golf Association is conducting research at its Riversdale Station. Their investigations in 1938 have been concerned primarily with the relative value of various manurial treatments, with trying out numerous commercial strains of velvet bent, creeping bent, Colonial bent and couch grass (Bermuda grass), and with the control of weeds in turf.

Estimates of the weed population

on the fertilizer plots were made for 1937 and again for 1938. All plots to which sulfate of ammonia and sulfate of iron had been added showed good weed control. Although it appeared that sulfate of ammonia was the best nitrogeneous fertilizer, there was strong evidence of the necessity of supplying phosphate in some form.

WATCH FOR WHITE GRUB DAMAGE

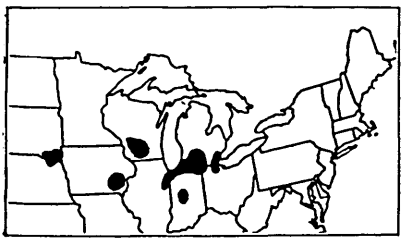
The life habits of the white grub were described by Luginbill of the United States Department of Agriculture in Farmers' Bulletin 1798,



Map showing districts of greatest abundance of brood A white grubs. The extent of these districts and the amount of the damage will vary somewhat from one outbreak to another.

and the author points out that in the area roughly bounded by the Ohio River on the south, the lower Great Lakes region on the north, South Dakota on the west, and Connecticut on the east, the most abundant and damaging form is brood A of the 3-year cycle. In this region an outbreak of more or less severity may be expected every third year, beginning in 1939.

The length of the cycle may vary with latitude, being 2 years in the southern and 4 years in the northern parts of the range of a species which has a 3-year cycle in the intermediate region.



Map showing districts of greatest abundance of Brood C of white grubs

Recently Louis A. Spain, research entomologist at the Iowa State College, as reported in the Seed World has called attention to the probability that damage to pastures in Iowa may be greater in 1939 than in 1938. Since the May beetle lays eggs on turf as well as on pasture it will be wise to watch for damage and to apply remedies.

The maps from Farmers' Bulletin 1798 show where brood A and brood C may be expected to be bad in 1939.