through the winter in good shape. The expenses of operating the turf garden are defrayed by funds furnished by the United States Golf Association Green Section and the Nebraska College of Agriculture. The field work is carried on by an assistant, usually a student, who is interested in this type of work. Dr. Keim, of the department of agronomy, personally supervises all operations.

The turf gardens lie on a deep layer of Waukesha silt loam. This is an old alluvial soil and is well adapted for bent grasses. The fertility and texture of the surface six inches are well fitted for mixing it with sand and manure for composting. The ratio of the compost used is 2-2-1, sand, soil, and manure respectively. Sharp, clean, plaster sand has been used with good success.

The turf work at the Nebraska station is conducted on an area of approximately 10,000 square feet. Of this area there are 80 plots 10 feet square which are devoted to clipping, fertilizing, and disease-control experiments. The nursery stock covers 1,000 square feet. The remainder is occupied with newly seeded plots of new and promising strains of bent.

All fertilizers, with the exception of the lime, are applied three times during the season. Lime is applied in the spring only. Compost is the vehicle used to spread the fertilizers, thus accomplishing two jobs with one operation.

Comparative growth is measured by standardized clipping and weighing of the clippings each time. Weed growth is determined by digging the weeds and then drying and weighing them.

Turf Experiments at Rhode Island Experiment Station

By E. S. Garner

The Agricultural Experiment Station of the Rhode Island State College, at Kingston, commenced in 1905 a series of experiments with lawn grasses. The object, as then stated, was "to test the influence of different fertilizers upon the permanence of white clover and certain grasses and to compare the adaptability of different grasses and mixtures for lawns, golf-links and polo grounds."

Thirty-five plots, occupying an area of about ¼ acre, were laid out on a piece of fairly level ground. The topsoil of this land is mellow and friable, but is underlain by a plastic yellow silt loam which prevents excessive leaching. These plots have been mowed at ordinary lawn or fairway height. They have provided data for two station bulletins, and a third is about to be published.

In May, 1928, two new projects were approved. About 1¼ acres of new ground were taken. The soil is of the same type as that of the old lawn plots and has a degree of acidity of about 4.5 on the Ph scale. This land was divided into three sections, known as A, B, and C.

The first of the new projects is a study of the seed production of the bent grasses. The object in view is to determine the suitability of the bent grasses for seed production in Rhode Island. As very little is known concerning the factors influencing seed production, data will be obtained as to the quantity of seed produced from different species, varieties, and strains of bent. The uniformity and tex-

ture of the turf produced from the seed will be taken into consideration. Sections A and B will be devoted to this project. Section A has been planted with seed, or stolons, obtained from different sources. All of the strains used belong to one or other of the three species *Agrostis stolonifera, A. tenuis, and A. canina.*

These plots are maintained under putting-green conditions and provide a testing ground where the individual strains can be observed. Those which prove inferior are scrapped, the best strains being used for seed production. Next to each planted plot on section A there is an unplanted plot. The former will serve as a basis of comparison for each adjoining plot, as it is desired to see whether the vegetative characteristics of the pedigreed strains are transmitted through the seed. In order that this may be done plants from the plots are being grown in the greenhouse, enclosed so as to exclude the possibility of cross-pollination. Seed from these will be collected and the vegetative increase from the plants so obtained will be grown on one-half of each of the reserved plots and compared with them.

Section B is devoted to seed production and was planted with 12 varieties and strains of the above-named species. Some of these plots were planted with stolons and some with seed. Where seed was used it was taken from the same bags as contained the seed planted on section A. There are 4 plots of each kind, arranged so as to minimize such variations as might result from inequality of the environmental conditions. A record will be kept of the weight and percentage of germination of the seed produced by each tested variety. This seed will be used for planting the other half of the reserved plots on section A. It will then be possible to see to what extent cross-pollination has affected the characteristics of the strains, under field conditions where every facility has been afforded for this to occur.

The second new project is a study of the response of acid-tolerant grasses to fertilizer nutrients. The purpose of this experiment is to determine the minimum nutrient needs of the bent grasses for maximum hay and seed production, having regard to the law of diminishing returns.

Thirty-six plots have been laid out on section C, and 4 plots, 1 in each quarter section of the field, are receiving the same fertilizer treatment. Rhode Island bent was selected for this experiment, as being a well-defined and representative species within the acid-tolerant group of grasses.

It is thought that nitrogen is usually the limiting factor in the nutrient requirements of grasses, and the fertilizer rations have been arranged on that assumption. This station has found that certain cereals which are sensitive to active aluminum require three times as much phosphoric acid for normal growth in the local acid soils as in solution cultures. This is probably because the high aluminum content of these soils is counteracted by heavy applications of phosphoric acid. But since the bent grasses are not sensitive to acid-soil conditions, it is probable that they are also tolerant of aluminum, in which case they would not require nearly so much phosphoric acid for normal growth as the cereals. This belief was also kept in mind at the time when the fertilizer treatments were formulated.

Next year these plots will be allowed to grow up and to produce seed. Tables will be made to show the results of the different fertilizer treatments in the yield of hay and seed, per pound of fertilizer.

AS WE FIND THEM

This is the season when the budget makers assemble to chart the financial seas.

One committee of the shekels is determined to have the most elaborate and expensive equipment in existence. "Machinery saves labor," it argues, "so let's cut down on all wages to help pay for the machines."

Other committees have learned that complicated machinery calls for some intelligent and well-paid help on the staff. Cheap, careless help around elaborate machinery makes the proverbial bull in the china shop look like a sick calf. A Rolls Royce requires something more than a Ford chauffeur.

Other guardians of the golden hoard have decided to make a big allotment for expensive chemicals to prevent all the pests of turf even though they recognize they have no one on their staff who knows how to use chemicals.

In time they may learn, as other committees have learned, that the worst pest of turf is cheap help with an unlimited supply of high-powered chemicals. Compared with that kind of a pest, brown-patch, grubs, and the like look like blessings. When the "baby cries for Castoria" some committees apparently would put the kid in a barrel of it.

Another committee has decided on a new club house although the course is admittedly in miserable condition.

It is argued that when members become thoroughly disgusted with the turf around the course and get all "het up" about the management it is well to have a luxurious and comfortable building where they may retire and vent their wrath. Most of the golf in some clubs is played in the club house anyway.