reviewed in this issue in the section, "What Others Write on Turf."

These results illustrate the possibilities which the bluegrasses offer to the plant breeders and those interested in better turf. Selection work among the bluegrasses combined with breeding programs to improve these selections will undoubtedly lead to new and vastly improved commercial strains available for the many different needs for which these grasses are to be used.

A DRY-LAND TURF GRASS

L. E. KIRK *

There has long been a demand for a suitable turf grass for semi-arid and sub-humid districts. Such a grass is required for lawns on farms and in small towns where a water supply is not available. The same is true for golf course fairways, school playgrounds, ball parks and other places that are used for sports.

In most of Saskatchewan and southern Alberta there has never been available until recently a species of turf grass which could be recommended with any degree of confidence. This statement probably applies as well to western North and South Dakota, Montana, eastern Washington and parts of Nebraska. This need, however, is now being met in a satisfactory manner with crested wheatgrass, *Agropyron cristatum* (L.) Beauv., and its use is steadily increasing.

Crested wheatgrass is noted for its great drought resistance and also for its winter-hardiness. It grows best during the cool

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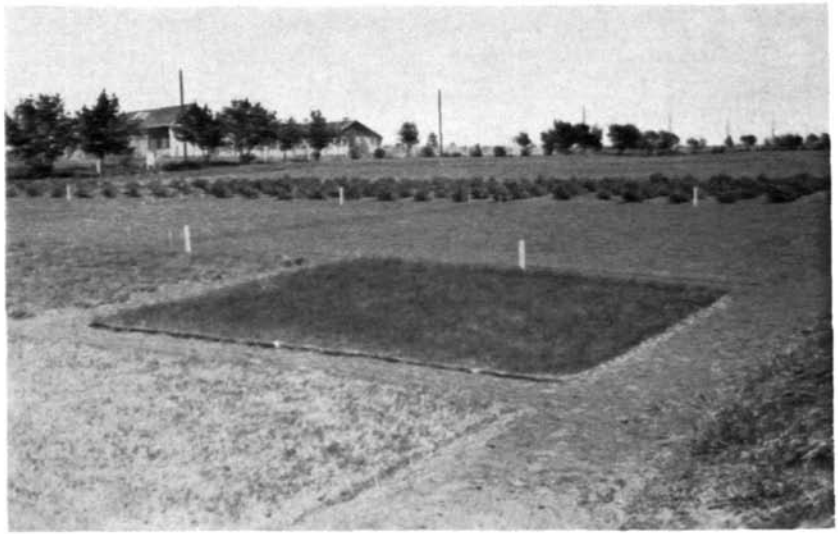

Plot of Fairway strain of crested wheatgrass (center) in experimental lawn at Saskatoon, Saskatchewan. Note thrifty appearance of Fairway strain as compared with grass in other plots

weather of the spring and fall months, the growth being retarded or inhibited by hot weather, when the foliage may turn brown. Nevertheless it is never permanently injured by drought and quickly turns green with the advent of moisture and cooler weather.

This grass develops a remarkably strong root system which takes complete possession of the soil. The fibrous roots extend laterally close to the surface and effectively compete with weeds. It is the root system which is largely responsible for its turfing qualities.

For turf, crested wheatgrass is limited in its range of adaptation to northern latitudes (or high altitudes) and relatively dry areas. The former insures a cool climate and the latter a low humidity, both of which seem to be most favorable for

A seed crop of Fairway strain, crested wheatgrass in Saskatchewan, June, 1938

normal growth of this grass. In more humid parts of the country its competitive efficiency in relation to other species of plants is not so great, but in such areas more desirable turf grasses can be used. Likewise relatively high summer temperatures act as a limiting factor to its usefulness at the southern extremity of its natural range of adaptation.

Where turf of fine quality is required and provision has been made for artificial watering, one hesitates to recommend crested wheatgrass even in the area where it is best adapted. With special attention to management and watering, a finer turf of more pleasing appearance can be obtained from Kentucky bluegrass or a mixture of Kentucky bluegrass and Colonial bent. Crested wheatgrass can be used successfully under similar conditions but there is always the danger that too much water will be applied. This is detrimental to the grass, and weeds are not so well controlled. For people who desire a good grass

cover on city lawns, parks and playgrounds, which can be left without attention for weeks at a time crested wheatgrass is worthy of consideration. Experience has shown that the grass may be cut short even after it is fully grown without materially affecting the appearance of the turf when growth is resumed.

Not all strains of crested wheatgrass are equally suitable for turf purposes. Most of them contain a high proportion of plants which are strongly tufted in habit of growth. By far the best as a turf grass is the "Fairway" strain, a variety developed by the author at the Provincial University, Saskatoon, Saskatchewan, Canada. The merits of this strain consist in its fine stems and leaves, its non-tufted habit of growth and especially in its ability to thicken into a relatively close turf. As compared with the taller growing and more tufted strains, the "Fairway" variety is also the best for hay and pasture under Saskatchewan conditions.

Seed of Fairway crested wheatgrass is now available in Canada at approximately 10 cents a pound. One pound of seed of this variety contains about twice as many seeds as an equal weight of other strains.

By the use of crested wheatgrass many farmers throughout Saskatchewan have been able for the first time to establish and maintain good lawns about their homes. Dwellers in towns that have no facilities for artificial watering are finding in this grass a valuable means of providing lawns and suitable turf for sport fields and playgrounds. The Dominion Experimental Station at Scott, Saskatchewan, which maintains extensive grounds, has discarded other grasses for crested wheatgrass. In the city of Saskatoon it is used as the most suitable species for grassing the steep southern exposure of a river bank. This city

Crested wheatgrass lawn at Scott, Saskatchewan

now grows its own seed in quantity for seeding boulevards and playgrounds.

In order to produce a close turf it is desirable to use plenty of seed and to have it distributed evenly. Spots that are missed are difficult to fill in later when once the roots of surrounding plants have occupied the soil. A rate not less than 4 pounds of seed to 1,000 square feet is recommended. This amount will provide more plants than are really necessary but the number of seedlings becomes reduced by competition to the required density of stand.

A well prepared and firm seed bed is highly desirable. The seed should be broadcast evenly and raked into the top half inch of soil. Crested wheatgrass seed will not germinate if planted deeper than 1 inch. One-quarter to one-half inch in depth is better.

When fairways and playgrounds, which comprise a considerable area, are to be sown, seeding with a double disc drill is

often preferred to broadcasting. In this case firmness of the soil is doubly important because of the danger of too deep seeding. In order to promote shallow seeding all pressure should be removed from the seeder discs. Clean crested wheatgrass seed will run through the seeder without being mixed with any other material, but the drill should be watched closely to see that none of the feeder cups become clogged.

Seeding should be done very early in the spring. This is often an important factor in successfully establishing this grass. The seed germinates at low temperatures and the seedlings become established much better in cool weather. When the roots have penetrated to 3 or 4 inches the plants are safe, but the seedlings readily succumb at an early stage of growth if the tiny rootlets become dried out in the top inch of soil. For this reason water, if available, may be used sparingly during establishment. Where water is not available, early seeding is the best insurance of success.

Crested wheatgrass will tolerate frequent clipping without injury. The first experimental lawn was laid down at the University of Saskatchewan 9 years ago. The condition of this lawn is as good as it ever was and no weeds can be found in it although dandelions have surrounded it each year. Experimental lawns of other strains of crested wheatgrass have not excluded the dandelions so successfully. There is also a marked difference in the quality of the sward, that of the Fairway strain being free from tuftiness and conspicuously superior in other respects.

A theory in practical turf maintenance, as in science, is a valuable servant but a poor master. Control your theories; don't let them control you.