

Turf Grass Experiments in Kansas

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Three years ago this month the United States Golf Association through the chairman of the Green Section, Dr. Chas. V. Piper, started a series of experiments relating to turf grasses in cooperation with the Kansas Agriculture Experiment Station. Dr. R. A. Oakley and Mr. H. L. Westover of the U. S. Department of Agriculture have kept in close touch with the work. It is through the financial support of the Green Section and the advice and help of its chairmen, Messrs. R. A. Oakley and H. L. Westover, that the work has been made possible.

Kansas is located on the west edge of the section to which cultivated grasses are adapted. The extreme heat of Kansas summers, which is usually accompanied by more or less severe drought, is disastrous to most tame grasses. It is therefore difficult to maintain lawns or putting greens in good condition. Probably no greater problem confronts the golf clubs of this section than that of establishing and maintaining grasses on their courses. Especially is this true of the greens. Our limited knowledge of grasses for golf courses in this section makes experimentation along this line highly desirable.

The purpose of the experiments is threefold (1) to determine the adaptability of certain grasses, the bent grasses in particular for putting greens and for lawns in the region of Manhattan, Kans., (2) to ascertain the best cultural methods for establishing and maintaining turf of these grasses and (3) to observe the influence of various fertilizer treatments on the control of weeds and maintenance of the turf.

The experiments comprise eighty-one plats 10 feet square. Fifteen different grasses are being tested, consisting of Kentucky bluegrass, redbtop, Chewings fescue, buffalo grass and eleven strains of bent grass. The Rhode Island bent, German mixed bent, and two strains of seaside bent were started from seed, the others being started from stolons.

The Washington and Metropolitan strains have produced the finest putting turf and at the same time have stood up better under rigid summer conditions than the others. The summer of 1926 was a severe test on all grasses in this section of Kansas. The total precipitation from January 1 to September 1 at Manhattan was only 12.12 inches while the normal for the same period is 23.47 inches. For the five months, April to August, inclusive, the total precipitation was 8.83 inches compared with a normal of 19.94. This latter period of extreme drought, accompanied also by periods of high temperatures and unusually high evaporation afforded a good opportunity to observe the relative summer hardiness of the various grasses. Excellent turf was maintained on the Washington and the Metropolitan plats throughout the entire summer. The best of the other strains produced only indifferent turf and some suffered severely. The Columbia and Arlington strains produced an open turf and languished during the hot weather but recovered considerably as autumn approached with cooler days and higher humidity. The Virginia strain produced a turf of coarse texture which lacked the smoothness observed in the Metropolitan and Washington. The Ver-

mont strain withstood the hot weather but is more upright in growth and seemed to suffer somewhat from close mowing with the greensmower. The Acme velvet has suffered severely from hot weather every summer, becoming thin and patchy it produces an unsatisfactory turf. The mixed bents have held their own quite well but the turf is not so dense and even as that of the better strains of creeping bent. Kentucky bluegrass was almost completely destroyed where it was cut close with a greensmower. Apparently close clipping must be avoided in order to maintain a stand of bluegrass. It is therefore not suited to greens in this section. It has also been found practically impossible to keep white clover out of the bluegrass plats.

Chewings fescue has been the nearest approach to a complete failure of any of the grasses tested. It makes a good growth in the autumn and early spring but as soon as hot weather comes the plants begin to die and the stand becomes thinner and thinner until the entire area is only sparsely set with bunches evenly distributed but at some distance apart.

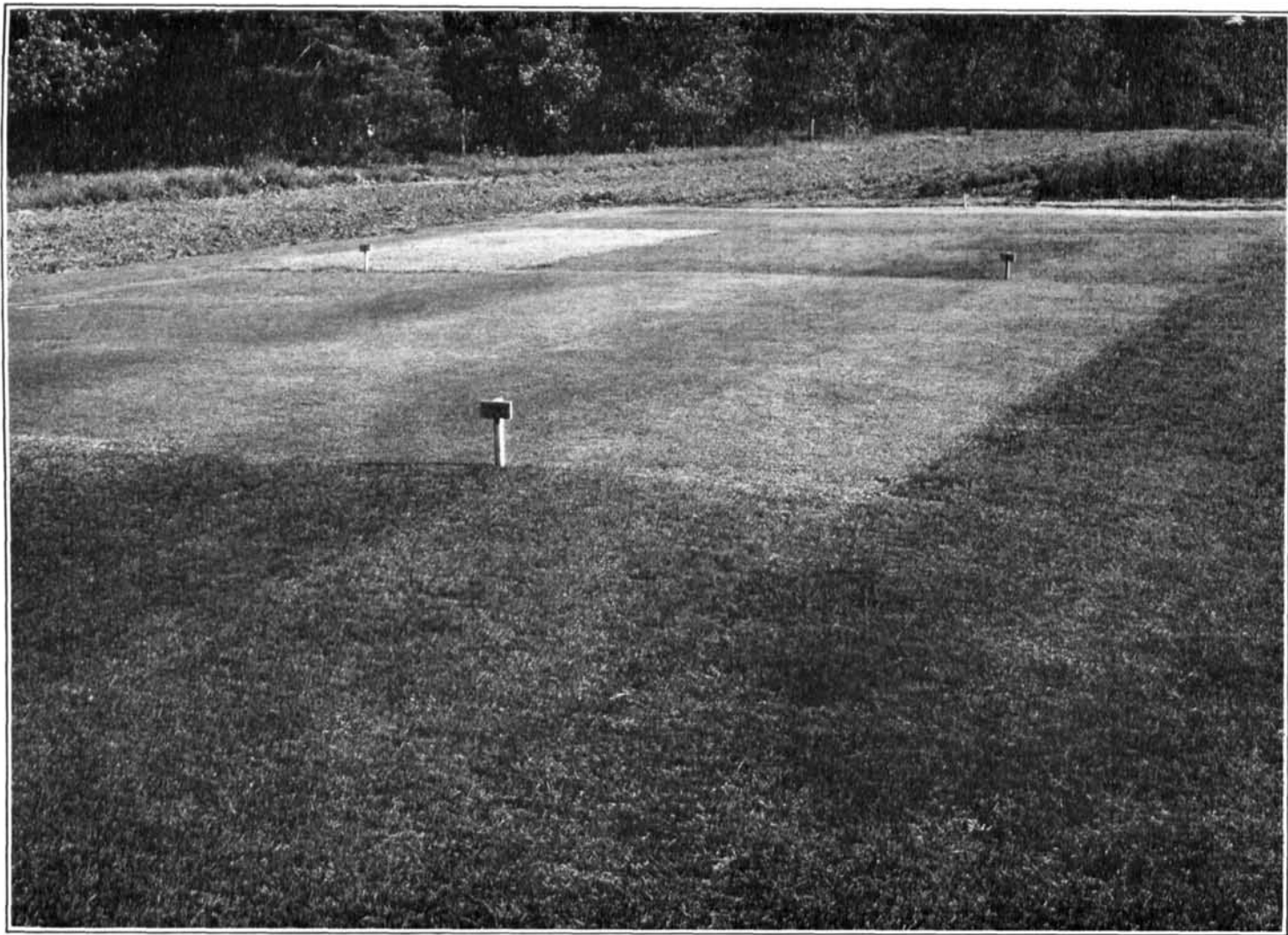
Some of the plats have been reseeded the third time and an excellent stand obtained from Chewings fescue. The seedlings start quickly when sown about September 1 and the grass looks extremely promising until about May of the following season when the plants begin to die. After repeated failures to maintain a stand this strain has been discarded and the plats planted to the better strains of creeping bent.

Buffalo grass is well adapted and requires little or no care to maintain the stand. Close mowing and topdressing have failed to make the turf dense enough for greens, so it is probable that it can be used to best advantage only on fairways in this section. Buffalo grass must be started from small pieces of sod but spreads rapidly if the weeds are kept out for a few weeks after planting. It does not compete well with weeds on fertile soil that is well supplied with moisture but will persist on dry uplands of central and western Kansas where tame grasses will not thrive. The purest stands of Buffalo grass are maintained without care under conditions which are unfavorable for the growth of weeds and other grasses.

The Country Club at Manhattan, Kans., has started a Buffalo grass nursery in which they propose to produce sufficient sod to plant a considerable portion of their fairways.

The fertilizer tests comprise 42 plots on which sodium nitrate, ammonium sulfate, urea and compost are used. Four applications have been made each season at the rate of $6\frac{1}{4}$ pounds per 1,000 square feet for the ammonium sulfate and sodium nitrate. This is equivalent to approximately 1,080 pounds per acre annually of these fertilizers. The effect of all the nitrogenous fertilizers on the growth of the grass is very marked. Check plats receiving neither fertilizer nor compost are in bad condition; the ground is hard, the turf is thin and making little growth. None of the fertilizers have shown any effect in the control of weeds or white clover. Tests show that the soil on the ammonium sulfate plots is still rich in lime, indicating that heavier or more frequent applications of that fertilizer will be required to obtain an acid condition and aid in the control of weeds.

Very little difficulty with weeds has been experienced on creeping bent plats outside the fertilizer tests which received both compost and



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A corner of the experimental plats at Manhattan, Kans. Metropolitan and Washington bent in the foreground. Buffalo grass in the left background and South German mixed bent at the right

ammonium sulfate. The turf of creeping bent is so dense that there is little opportunity for crab grass or other weeds to get a good foothold. The contrast with bluegrass in this regard is very noticeable. Bluegrass turf becomes open in midsummer thus giving crab grass a chance to start at the season when it thrives best and when the bluegrass is somewhat dormant.

Brown-patch was not observed when the turf was new and caused very little trouble in the extremely dry summer of 1926. During the past season it has been extremely serious. Both the small and large brown-patch appeared repeatedly and caused some damage to the turf of all varieties of bent. Some plats were treated every few days throughout the entire summer. Perhaps the treatments have been less effective than usual or the benefits of shorter duration because of unusually frequent showers and high humidity from May to September. Experience has taught us that in order to combat brown-patch successfully one must be on the job every day to observe the very first signs of an outbreak and to apply the treatment immediately.

During the dry weather when watering was done in late afternoon and evening birds, especially robins, came to the plats in great numbers, apparently in search of insects and for material with which to build their nests. The turf would often be torn up in spots producing a roughened surface. As many as 50 of these torn places were found on 100 square feet of turf. Most of the damage was done soon after dawn when robins would flock to the plats in great numbers and work industriously until the middle of the forenoon when it began to get hot, leaving the torn spots to suffer from the heat of the day. This trouble was largely overcome by watering earlier in the day so that the surface would be fairly dry before evening. No damage was done immediately following showers as the birds then seemed to go elsewhere for food and nest building material.

The experimental work in Kansas up to this time leads to the conclusion that the routine essentials in maintaining good putting turf in this section are close mowing, frequent, light watering, use of compost and fertilizers, and close attention to the control of the brown-patch disease.

“How often we see courses where the approaches have not only been overlooked by the architect, but also forgotten by the green-keeper.”—The Links.

QUESTIONS AND ANSWERS

All questions sent to the Green Section will be answered in a letter to the writer as promptly as possible. The more interesting of these questions, with concise answers, will appear in this column each month. If your experience leads you to disagree with any answer given in this column, it is your privilege and duty to write to the Green Section.

While most of the answers are of general application, please bear in mind that each recommendation is intended specifically for the locality designated at the end of the question.