

Iowa Bent Trials Promise



Dr. H. L. Lantz

Better Strains

By DR. H. L. LANTZ

Assistant Research Professor of Iowa State reports on program of turf investigation as the project enters its 8th year of vigorous searching for better strains.

SOME 15 years ago, the Iowa Greenkeepers Association was organized. This group started modestly but kept building better programs and gaining in strength. During the '30's, the organization recommended to the Iowa Experiment Station that a project be established to investigate problems of fine turf maintenance. A formal project was drawn up and approved in 1939. The fine turf project was under the direction of Dr. S. W. Edøecombe until 1942, and then turned over to me.

The first turf plots were planted in the late summer of 1939. Eight strains of bent were secured from the USGA Greens Section. These included C1, C15, C17, C19, C28, C36, Washington, and Metropolitan. The plots were laid out by Dr. S. W. Edøecombe who was in charge at that time. The trial plots were 6 feet by 6 feet in size, replicated three times. The turf garden plantings were enlarged in the fall of 1941 adding C27 and C32 and Old Orchard. In September, 1942, ten strains of bent grass secured from Dr. H. B. Musser were planted in plots in a 3 replications series. This fall other strains were secured from various sources to bring the total to around 30 or more. Somewhere between 8 and 9 thousand square feet are now maintained as close clipped turf. In addition, there is a plot of 3,000 square feet in blue grass.

During the war, the turf program had to be conducted on a maintenance basis. The records, however, on the behavior of the different strains are fairly complete.

The chief objective in this project was to first study the adaptation of the different strains to Iowa conditions, taking into account disease resistance. In other words, to determine whether any among the newer strains were superior to the Metropolitan and Washington bents, the two most commonly used bents in Iowa.

Our studies have dealt largely with the behavior, desirability, disease resistance, winter hardness, resistance to summer

heat, etc. The records so far have proved to be of considerable interest in appraising the comparative desirability of the different bent strains as they are growing under the conditions of this experiment.

It should be explained that the soil where the turf garden is located is a heavy Webster silt loam, one of Iowa's best corn soils and a prevalent soil type in many parts of central and northern Iowa. The turf garden is flat, slopes gently toward the east, has no tile drainage or special preparation for the growing of bent grass turf. Water is supplied by two lines of Skinner irrigation pipes. Mowing is done with a hand greens mower. Topdressing has been applied 4 times per season. The topdressing consisted of well composted soil mixed with 1/3 sand. The fertilizer program in general was as follows per 1000 sq. ft.: Spring—Milorganite, 25 lbs. plus 0-12-12, late summer repeated. During the summer—Lighter applications (10 lbs.) of Milorganite, and ammonium sulphate (1 to 2 lbs. per 1000 sq. ft) were made at more or less regular intervals, or just frequently enough to maintain vigor and color. There were times however when it was apparent that the supply of nitrogen was allowed to go too low. In the fall of 1945, acidity tests showed a pH of 5 to 5.5 Spent hydrated lime was applied in October at the rate of about 15 lbs. per 1000 sq. ft. to study the effect on the turf.

Surprisingly enough, very little brown patch has invaded the turf garden area. This is doubly surprising since no fungicide treatments have been made since it was planned in the beginning to study the relative disease resistances of the various strains. On several occasions, dollar spot attacks were severe early in the season. In 1945, dollar spot ran wild after July 15 and by September 1, a generally severe and epidemic attack was made on all strains. Some of the strains however showed marked resistance as compared with some neighboring strains. On July 3, C1, C19, and Metropolitan showed marked resistance. On September 26, C1 still



Left above: No. 1 fairway, Ames G&CC. Weedone applied at rate of 1 gal. to 100 gals. water, Aug. 8, 1945 on 51,200 sq. ft. Area in upper right was not treated. Photo taken Aug. 8, 1945. Right above: A weed free fairway area following a 2,4-D treatment. 50 gals. of .1 percent solution was sprayed over this area of 25,000 sq. ft. on Aug. 8. Note dandelions in unsprayed area, upper left. Photo taken Sept. 6.

showed marked resistance. All others had a general invasion.

Variety Tests Showings

What do the variety tests teach?

In all of agriculture, the variety is basic. There has been a vigorous searching for better varieties all through the agricultural world. Better adaptation, more resistance to diseases and insects, and higher yields have been the goals of variety experts and plant breeders. As a result, agriculture has made great forward strides because of the origination and introduction of new varieties. Several examples will show what I mean. In Iowa, the new hybrid corn varieties have upped the average yield from around 40 bushels per acre to nearly 60 bushels per acre, a state-wide average. In oats and wheat, similar important increases in yield have been attained through the origination of disease resistant varieties. The story is the same in fruit and vegetable crops and in ornamentals. The results secured with new and improved varieties have been amazing. We believe that the work so far done through breeding, selection, and testing, indicates what can be achieved in bent grasses to originate disease resistant strains and strains better adapted to specific regions and soils.

In the middle west, bent grasses which resist winter cold and summer heat are essential. The pioneer work done by the USGA Greens Section and the U. S. Department of Agriculture in selecting and isolating many strains of bent grass is most commendable. In Iowa, the Washington and Metropolitan bents have almost wholly replaced the German mixed bents, Virginia Seaside, and many other bents. Both Washington and Metropolitan are admirably adapted to Midwestern conditions and both strains have ardent champions among greenkeepers. On well

drained soils, Metropolitan does exceedingly well but is not at all at home on low lying poorly drained soils. Washington is at home on many soils but is perhaps more susceptible to disease than Metropolitan, and in the fall is severely browned by the first frost. In fact none of the 20 or more strains under test in the turf garden are browned by frost as quickly and noticeably as is Washington.

Promise of Superior Strains

By testing many new bent grasses, we hope to find strains which are superior in general behavior to Washington and Metropolitan. I don't feel however that we are ready at this time to state with assurance that any one of the strains which we have tested are good enough to replace Washington and Metropolitan. There are certain pertinent observations however which indicate that there are strains in our Iowa turf garden which are worthy of serious consideration for more general trial plantings. Briefly, these are in order of preference, C19, C1, Old Orchard (C52) and possibly C27. Each of these have been winter hardy, have desirable texture, color, and good growth characteristics. None are wholly disease resistant. Over a period of 5 years, C19 has consistently scored high every year. It has excellent dark green color, a dense compact surface, and produces a good putting surface. It is susceptible to brown patch but responds to treatment quickly. In 1944 and in 1945, C19 was among the last to become infected with dollar spot. There are greens of C19 on several courses in Iowa which are doing very well. One greenkeeper says he is going to put in more greens of C19 as fast as conditions will permit.

C1, often referred to as Atlantic City is a tough bent which stands a lot of

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abuse. It has been more widely tested on golf courses in the Middle West than any of the other numbered strains. Under central Iowa conditions, it is fairly resistant to disease, but brown patch is sometimes serious. Just north of Des Moines, Clarence Yarn who owns and operates the Woodside Golf Course has C1 greens which are 10 or 12 years old. The course is on timber soil and the greens are placed in a great variety of locations with respect to soil drainage, air drainage, etc. For the past 4 years, the course has been closed. Yarn has maintained the greens with the minimum of care. He has not applied fertilizer nor fungicides during the past 5 years. These greens as we observed them in October, 1945, were in surprisingly good condition. Yarn believes that C1 is the only bent capable of living through with such treatment and that C1 is the best bent grass for the average greenkeeper because of its generally superior performance. In the turf at Ames, C1 has rated among the top 3 grasses year after year. On the Iowa State College course, 4 greens of C1 compare well with the best greens grown anywhere in Iowa. The other 14 greens are covered with Washington. As a general statement, it can be stated that C1 has under midwest conditions, proved to be a valuable bent grass. There are one or more greens of C1 on a number of golf courses in Iowa and it is our considered opinion that in the future, more of it will be used rather than less.

The college golf course at Ames is a scenic and colorful 18 hole course. No. 1 green, alternate, was built in 1939, in co-operation with the USGA Greens Section and the Experiment Station. Twelve strains of bent were used in the construction of the green,—a typical pie-shaped test green. The bent grasses consisted of C1, C51 (Metropolitan), C36, C19, C27, C17, C28, C15, C7, C52 (Old Orchard),

C50 (Washington), C32. Originally there were 3 seeded segments, all of which did so poorly that they were replanted with stolons of C27, C28, and C32. This green has been maintained in the same way as the other greens on the course and is usually in excellent playing condition. In September of 1943, 1944, and 1945, members of the Iowa Greenkeepers Assn. graded the 12 segments of this No. 1 green with the following results:

A summation of the collective judgments of the greenkeepers in September of 1943, 1944, and 1945:

	1943	1944	1945
1.	C51 Metro-politan	C28	C19
2.	C19	C19	C52 Old Orchard
3.	C28	C1	C51 Metro-politan
4.	C1	C51 Metro-politan	C15
5.	C27	C32	C1
6.	C32	C52 Old Orchard	C27
7.	C15	C27	C7
8.	C52 Old Orchard	C15	C50 Wash-ington
9.	C50 Wash-ington	C7	C28
10.	C7	C50 Wash-ington	C36
11.	C36	C36	C32
12.	C17	C17	C17

The collective judgment of greenkeepers may perhaps be a fairly reliable index by which to judge these bent grass strains, but it should be pointed out that the greenkeepers themselves in their placings, vary tremendously. They do, however, on the average, agree fairly well in their selection of the top 3 or 4 bent grass strains.

Now as to the prospects for improved strains of bent grasses.

The two well known methods of covering a green with bent grass are by seeding or stolonizing. In the middle west, stolonized greens are by far the most popular for the reason that stolonized greens are uniform in color, growth and in their behavior during the extremes of summer

This small power sprayer with a .6 nozzle boom delivered 2½ gallons per minute at 275 lbs. pressure. The spray is delivered as a fog-like mist. This outfit covered one acre in 20 minutes.



heat and winter cold. In Iowa, the most widely used bent grass is perhaps Washington followed by Metropolitan and C1. With the "know-how" possessed by greenkeepers, these strains produce beautiful results. But we are not satisfied. Each of these popular strains have to be watched continually during the entire growing season and steps taken to protect them against brown patch and dollar spot. Disease control is costly in terms of fungicides and the labor needed for their timely application. A bent grass free or more resistant to disease than the common varieties now used would obviously be of extreme value under our conditions. Were diseases easy to control, we perhaps could be satisfied with the present varieties.

Bent grasses are heterozygous in their genetic constitution which simply means that they are of mixed origin. It is here that the hope of improvement lies. Seedlings of bent grass are variable in many characteristics. They vary in vigor, color, texture, hardiness and in disease resistance. The problems of breeding, selection and testing are problems for men trained in the sciences involved. The Greens Section has made notable progress and is to be commended for its work in selecting, testing and the introduction of such excellent varieties as Washington, Metropolitan, Old Orchard and C1.

Fertilizer Development

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concentrated materials containing 79 units of plant food.

During the past year the writer has made several applications of high analysis granular materials to lawns. It has been possible to apply as much as 40 pounds of nitrogen per acre, even in the heat of summer, with such materials without either watering in or bad discoloration to the grass. Such materials would hardly be practical on greens unless immediately dissolved by thorough watering.

It is not improbable that the miracles attributed to soil-less culture and the materials which have proven this method commercially practical on high value greenhouse crops, may point to a definite future trend in fertilization through utilization of complete nutrient solutions. Altho such developments in fertilizer practice would not surprise me, wide acceptance of new theories will be gradual. Still golf courses were among the first to use soluble materials applied by various types of proportioning devices and I personally look for their increased use in the years immediately ahead.

In our haste to adopt new ideas we dare not lose sight of the importance of organic matter, the life of our soils.



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