by hybridizing Tifton No. 57, Tifton No. 55 and several of the best selections from golf courses with a very fine-leafed Bermuda obtained from T. R. Garlington of the Atlanta Athletic Club (East Lake). The hybrids are now under observation, and it is hoped that some will possess the desired characteristics of both parents.

Some of the other problems receiving special attention at the Southeastern Turf Research Center might be listed as follows:

1. Breeding better Bahiagrass strains for heavy duty turf.
2. Studies on centipedegrass seed production.
3. Fertilization studies including:
   (a) Nitrogen source test on centipede and Bermudagrass,
   (b) Soil reaction as it affects the production of southern turf grasses,
   (c) Effect of organic and inorganic sources of nitrogen on Bermudagrass greens.
4. Insect control studies.
5. Crabgrass, Nutgrass and Dallisgrass control.

The results from these studies are considered to be of a preliminary nature, which may be altered with additional experience.

It has been the purpose of this paper to report on the progress in the breeding of Bermudagrass for turf and not to give an extensive summary of all the projects under way at the Southeastern Turf Research Center at Tifton.

# MERION (B-27) BLUEGRASS

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The selection and testing program which has resulted in the release of Merion (B-27) Kentucky bluegrass for commercial production is one of the achievements of the cooperative research program being carried on by the USGA Green Section and the Department of Agriculture.

This grass was tested by the Green Section for several years before the war. With the curtailment of Green Section activities in 1942, the Division of Forage Crops and Diseases, Department of Agriculture, took over the work, carrying on the clonal stock and observing plantings which had been made. At the end of the war the Green Section resumed its field work and since that time the Department of Agriculture and the Green Section both have been interested in getting Merion into production.

Merion bluegrass was observed for a number of years by Joe Valentine, superintendent at Merion Golf Club, in Ardmore, Pa., and a plug of turf was given to the Green Section in 1936 along with two similar strains from a tee at Merion. The name Merion was chosen for B-27 bluegrass by reason of the origin of the original material. Merion was described as a dense, dark-green turf growing in partial shade, spreading over several feet and crowding out weeds with its vigorous growth. Other morphological characteristics of this grass are:

1. Short leaves, 3 to 5 mm. in width.
2. Height when flowering, 16 inches.
3. Open panicles with 3 to 5 florets on each spikelet.

Twelve years of testing and observing Merion at the old Arlington Turf Gardens and at the Bureau of Plant Industry have shown this strain to be markedly superior to ordinary commercial bluegrass in the following characteristics:

1. Resistance to Helminthosporium leafspot.
2. Lower growth habits (tolerates closer mowing than common bluegrass).
3. Rate of spread.
4. Vigor of rhizomes.
5. Turf quality and appearance.
6. Resistance to weed invasion.
7. Heat and drought tolerance.

The seed of Merion bluegrass is uni-

form in characteristics and can be distinguished easily from commercial bluegrass seed. The seed of Merion is shorter and plumper and lacks the usual brown tinge found at the base of commercial bluegrass seed. Further tests are now under way to ascertain whether or not this valuable characteristic will be maintained under wider environmental conditions.

In addition to the trials carried on by the Green Section and the Department of Agriculture, test plots also have been observed for a number of years at Milford, Conn., Lexington, Ky., and Ames, Iowa. These test plots have been maintained at several heights of cut as well as under other variable conditions.

### 30 Cooperative Tests

Although Merion was already under increase in Oregon as a result of these tests, it was felt by the Green Section that further observation on widely scattered comparable plots would be necessary before approval of large-scale production and usage could be sanctioned.

With this thought in mind, more than thirty cooperators from state experiment stations and golf courses were selected to carry on comparison tests. Trials were laid out in 14 different states and in Canada; therefore a good cross section of the country was included. One hundred pounds of foundation Merion seed, made available through the courtesy of Lloyd Arnold of the Associated Seed Growers and Geary Brothers of Klamath Falls, Ore., was distributed to cooperating agencies by the Green Section in 1947.

Cooperators were furnished two pounds of seed and were requested to plant it under conditions favorable to Kentucky bluegrass, in direct comparison with a comparable plot sown to commercial bluegrass. Both plots were to be 1,000 square feet and were to be treated identically. The commercial plot was to be used as a standard for comparing weed invasion, Helminthosporium leafspot and other diseases, general acceptance from the turf standpoint and for obtaining other pertinent data and observations.

In November, 1948, the first or "establishment" report form mailed to cooperators requested information concerning the time of planting, germination period, soil conditions, management and incidence of disease and weed infestations. Sixteen replies that included information concerning tests in 11 states were received for evaluation. From this it was ascertained that both comparison plots grown by each cooperator had been treated identically and that Merion was being compared to Kentucky bluegrass under a wide range of soil, climatic and management conditions. The following is a summation of the first report:

1. Eleven cooperators reported Merion to be superior to commercial bluegrass.

2. Two cooperators failed to summarize the outstanding characteristics.

3. One cooperator reported both Merion and commercial bluegrass to be poorly established.

4. Two cooperators reported commercial bluegrass to be superior to Merion.

(It is interesting to note that the three cooperators in Nos. 2 and 3 reported Merion as being superior in the July, 1949, report. The two cooperators in No. 4 show in the July report that Merion is equal or slightly superior to commercial bluegrass.)

The second, or "performance," report form, which was mailed to cooperators in July, 1949, requested information and ratings on disease incidence, crabgrass infestation, heat and drought tolerance, color, turf quality and general appearance. The observations were made in August and September, 1949. Ratings were made on the basis of 0 to 10, percentagewise. For example, if a plot showed 50 per cent diseased leaves, a mark was made in column No. 5. A plot showing no disease received a mark in the 0 column. Thus the best rating would fall in the lower column numbers.

Twenty-seven returns on this second report form were received for evaluation. Ten of these returns were incomplete and consequently could not be analyzed. To evaluate the remaining 17 returns the column numbers were totaled on a master sheet.

| Cooperator | Disease | | Crabgrass | | Heat and Drought Tolerance | | Color | | Turf Quality | | General Appearance | | Totals, All-Around Performance | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Com.* | *Mer.* | *Com.* | *Mer.* | *Com.* | *Mer.* | *Com.* | *Mer.* | *Com.* | *Mer.* | *Com.* | *Mer.* | *Com.* | *Mer.* |
| 1. B. P. I., Md. | 3 | 1 | 7 | 2 | 7 | 1 | 5 | 0 | 8 | 0 | 8 | 0 | 38 | 4 |
| 2. Phila. C. C., Pa. | 5 | 2 | 5 | 1 | 8 | 2 | 8 | 0 | 9 | 3 | 9 | 0 | 44 | 8 |
| 3. N. J. Exp. Sta. | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 5 | 4 |
| 4. Ky. Exp. Sta. | 7 | 5 | 1 | 1 | 7 | 1 | 7 | 1 | 3 | 7* | 5 | 3 | 30 | 18 |
| 5. Mo. Exp. Sta. | 2 | 0 | 3 | 1 | 3 | 0 | 2 | 1 | 3 | 1 | 3 | 1 | 16 | 4 |
| 6. Ohio State Univ. | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 5 | 0 | 13 | 0 |
| 7. Denver C.C., Colo. | 2 | 0 | 3 | 1 | 4 | 2 | 4 | 0 | 4 | 0 | 4 | 0 | 21 | 3 |
| 8. Penn State | 7 | 2 | 3 | 1 | 3 | 5* | 3 | 3 | 6 | 3 | 6 | 3 | 28 | 17 |
| 9. Cleveland, O. | 0 | 0 | 6 | 1 | 1 | 0 | 3 | 1 | 1 | 1 | 3 | 0 | 14 | 3 |
| 10. Mich. State | 1 | 1 | 2 | 2 | 0 | 0 | 4 | 4 | 4 | 3 | 3 | 3 | 14 | 13 |
| 11. Indianapolis, Ind. | 7 | 0 | 5 | 1 | 9 | 1 | 10 | 0 | 7 | 0 | 5 | 0 | 43 | 2 |
| 12. Capital Parks, D.C. | 2 | 1 | 1 | 1 | 3 | 1 | 3 | 1 | 3 | 1 | 4 | 1 | 16 | 6 |
| 13. Clayton, Mo. | 6 | 0 | 5 | 5 | 2 | 0 | 2 | 0 | 2 | 0 | 2 | 0 | 19 | 5 |
| 14. Univ. of Cal. | 0 | 0 | 0 | 0 | 1 | 1 | 2 | 1 | 3 | 1 | 3 | 2 | 9 | 5 |
| 15. Purdue Univ., Ind. | 5 | 1 | 3 | 1 | 0 | 0 | 2 | 2 | 5 | 0 | 6 | 0 | 21 | 4 |
| 16. Rochester, N. Y. | 6 | 2 | 3 | 1 | 4 | 1 | 4 | 1 | 6 | 1 | 4 | 1 | 27 | 7 |
| 17. Marysville, Ohio | 6 | 1 | 1 | 0 | 0 | 0 | 2 | 0 | 4 | 0 | 3 | 0 | 16 | 1 |
| TOTAL | 59 | 16 | 51 | 19 | 53 | 16 | 62 | 16 | 75 | 22 | 74 | 15 | 374 | 104 |

* *Only two instances from the 102 ratings in which Merion was inferior to commercial bluegrass. In all other cases Merion was equal or superior to commercial bluegrass.*

It is impossible to include all the comments made concerning the outstanding characteristics in the above table. For this purpose four cooperators have been selected at random and quoted as follows:

> This has been an interesting comparison, and in spite of the severe weather Merion has been outstanding. The Central Ohio Greenkeepers were very much impressed by the performance of Merion bluegrass. (Ohio)

> Commercial bluegrass looks much better than usual in August, because there has been no drought or severe heat. Turf now formed by Merion at Columbia, Mo., is excellent. (Missouri)

> Commercial bluegrass will suffer for water before Merion shows signs of needing any. This plot is on a light sandy soil. Merion is far superior at either ½-inch or 1½-inch height of cut. (Colorado)

> We consider Merion bluegrass to be definitely better. It has a deeper color. It spreads out closer to the ground and takes less mowing for this reason. It forms a very dense, tight turf. It may be more resistant to weed invasion. We have grown an excellent turf of both Merion and the commercial bluegrass on an adobe clay by using generous feeding. (California)

In reviewing the demonstrated superiority of Merion bluegrass as the result of 12 years of testing, it would seem that Merion bluegrass has proved itself worthy of recommendation for seeding alone or as a part of seed mixtures throughout the range of Kentucky bluegrass adaptation. It has been tested in California, Oregon, Colorado, Iowa, Missouri, Illinois, Indiana, Michigan, Ohio, New York, Pennsylvania, New Jersey, Rhode Island, Connecticut, Maryland, Kentucky and Washington, D. C. Many other states and Canada are also cooperating with the Green Section in testing Merion, but as yet they have not made reports on the outcome of their trials.

Merion is already in commercial production, and the demand for seed is great and increasing. There is need for further wide-scale testing of Merion bluegrass, particularly farther south and in the crabgrass belt as a permanent cool-season grass in mixture with the southern warm-season grasses.

The Green Section will welcome reports from those who are growing turf produced from Merion bluegrass seed.