



Part of the turf testing nursery at Penn State.

# Progress at Penn State in Hunt for Perfect Greens Grass

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Note: A complete description of Penn State's exhaustive breeding tests with turf grasses, now entering its sixth year, appeared in the January, 1932, issue of *GOLFDOM*, to which interested readers are referred. In brief, the method is to plant various lots of seeds under glass in February, later transfer the seedlings to outdoor experimental plots, from which careful records of the characteristics exhibited by individual plants are taken, beginning in the fall of the first season.

At the end of the second season, those plants which have shown promise of possessing desirable characteristics are lifted bodily out of the nursery and cut into stolons, so that a sod may be grown from that plant only. Below is a description of how this sod is tested.

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**T**HE TURF forming qualities of the selections are tested on what might be called "the proving ground." This is a level area that has received soil preparation to make it as nearly comparable as possible to conditions on a good green. At the present time it consists of 96 plots 6 feet by 6 feet in size. The entire area is treated uniformly from the standpoint of watering, fertilizer applications and clipping. In applying topdressings, however, the amount applied to any plot is regulated

by the need of that particular strain as indicated by the appearance of the turf. We would like to do this also with watering, fertilizing and clipping, but there are so many practical difficulties involved in varying these treatments on individual plots that it seemed desirable to keep them uniform. To overcome this difficulty we are planning a series of what might be called quarantine plots, where strains that are otherwise good but do not seem to do their best under the common method of handling can be studied under different maintenance conditions.

One of the greatest difficulties connected with the study of strains in the sod plots has been to find a satisfactory yard stick with which to measure the relative quality of the different plots. In order that there may be a uniform standard of comparison, against which all plots can be checked, every fourth plot of every second row has been planted to the same strain of grass. We are using the Washington strain at the present time as the check strain; any strain could be used for this purpose.

Another step in creating a yard stick that will measure as accurately as possible, is the provision for duplicate plots. In maintaining plots of this type there is always the possibility that accidents will happen or that conditions may occur on a

plot that are not easily accounted for. By maintaining duplicate plots of each strain the one can be checked against the other and the chances of error in record making reduced. While this doubles the area of the test plots and doubles the time spent in caring for them and making observations, we feel that this is well worth while because of the added protection against mistakes. We would really feel much safer if we could have 3 or 4 plots of each selection. This seems out of the question, however, with our present budget.

### Records Are Complex.

A yard stick to be of any value must actually measure a yard. Similarly, a study of the qualities of different strains of grass must give us at least a reasonably accurate picture of their more important characteristics from a turf forming standpoint. There is practically no limit to the number of detailed notes and records that can be taken throughout the four or five year period during which a strain is under observation. The difficulty is that records which are too detailed become so unwieldy that they defeat their own purpose.

### Questions Rate Selections.

Records that are kept on each proving ground plot attempt to answer the following practical questions about each selection.

How fast does it grow in comparison with the standard? How does it stand cold weather? How early does it start in the spring? Is it resistant to disease? If it takes diseases, how quick does it recover? What kind of turf does it make in comparison with the standard when growing conditions are good? What is the condition of the turf in comparison with the standard when growing conditions are poor? How is its general vigor with respect to resistance to weed infestation? (We use *poa annua* as measure because it volunteers very readily at this time of the year in our section of Pennsylvania.) How badly does it grain in comparison with the standard? It will be recalled that each plot is composted separately according to its needs, to reduce graining to the lowest point possible for each strain.

At the end of each growing season the records on each strain are compared with those for the check plot that is closest to it. It tells something about the value of any selection in comparison with the standard, and gives a basis for comparing one strain with another. These comparisons, together with the earlier records obtained from the plant nursery, are used as the yard stick to measure the possibilities of the strain.

### Seven Grasses Rate High.

Last season marked the end of the five-year period necessary to get a complete set

of records on the first group of selections made in 1928. In that year records were made on approximately 1,700 plants in the plant nursery. Thirty-one of these original plants have come through the second year in the sod plots. Records on 7 of these 31 selections are so encouraging that they will be multiplied during the coming season for practical trials.

Since 1928 an average of approximately 800 plants have been grown each year in the plant nursery. As a result of selection from these we have 42 strains of *Agrostis canina* growing in the propagating nursery. Fourteen of these have already had one season in the sod plots and the others will be put in as soon as possible. In addition to these the propagating nursery contains a total of 53 selections of *Agrostis palustris*, 40 of which have been in the sod plots for from one to two years.

### Greenkeepers Aid in Tests.

The greatest weakness of the selection work as described thus far will be apparent, immediately, to the practical greenkeeper. It does not give us performance records of the new selections under growing conditions that are different from those at State College. In addition, it makes no provision for giving a new selection the most important test of all—its performance under actual playing conditions.

As strains demonstrate in the preliminary study that they have desirable qualities from a turf forming standpoint, such as a high degree of resistance to disease, winter hardiness, freedom from graining, etc., and deserve further testing, they are multiplied and as soon as sufficient material is available, small amounts of each strain are sent out to greenkeepers in different sections of the state who are willing to grow them in their nurseries and make the necessary observations on them. At the present time from four to seven new strains are being grown for observational purposes on eight courses in various parts of the state.

### Invite New Specimens.

Facilities at the Pennsylvania State College are excellent for making playing tests on the new strains. An 18-hole course is maintained by the college on which an average of approximately 200 rounds of golf are played per day. One of the greens has been set aside for the strain tests and plantings will be made as fast as material becomes available and budget limits permit.

One additional phase of the study of strains of the bent grasses should be noted. In addition to the testing work being done with new selections we have a number of strains growing in the sod plots or propagating nursery that have been selected by greenkeepers on their own courses.