

Grass Seeds In America

By PROFESSOR THEODORE E. ODLAND

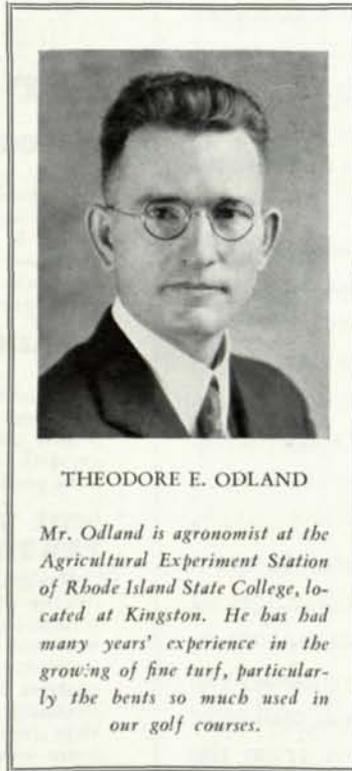
Read at the 5th Annual Educational Conference of the National Association of Greenkeepers of America, held at Columbus, Ohio, February 3-6.

EVERY greenkeeper who has at any time seeded down either greens, fairways, or tees knows the importance of using good seed. All the effort and money which has been spent in getting the greens or other areas ready to be seeded goes for naught, at least for the time being, if a poor lot of seed is used.

At this point the item of good seed is one about which hinges the success of our entire program. Since the securing of good seed of an adapted type or variety is such an important consideration to the greenkeeper, it is well worth our while to briefly consider where some of our grass seeds are produced and where others are obtained.

Before going into the details of where and how our commonly-used grass seeds are obtained it may be well to mention briefly what are the chief essentials of good seeds. In the first place the seed should be of a type or variety that is suitable for the climate and soil where it is to be used. A careful consideration of this item is, of course, important. In the second place the seed itself should be of good quality. Good quality includes high germination and a reasonable degree of purity. It should be free from noxious weed seeds and contain a fair degree of freedom from chaff, dirt, and other inert matter. There are other considerations also which we might mention that enter into good quality of seed but the above are the more important ones.

The grass seeds which we use most on our golf courses are partly produced in this country and partly imported. In this paper only the more important ones will be considered. The figures on the



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Mr. Odland is agronomist at the Agricultural Experiment Station of Rhode Island State College, located at Kingston. He has had many years' experience in the growing of fine turf, particularly the bents so much used in our golf courses.

acreage and amount of seed produced have been obtained from a number of different sources including growers, seed dealers, experiment stations and the U. S. Department of Agriculture.

THE BLUEGRASSES

THE two chief kinds in this group are Kentucky bluegrass (*Poa pratensis*) and Canada bluegrass (*Poa compressa*).

Kentucky bluegrass seed is produced chiefly in Kentucky, Missouri and Iowa. The annual production in this country ranges from two to fourteen thousand tons. The past year the production was estimated at about five thousand tons. Very little of this seed is imported. The average imports

have averaged only a little more than a ton annually for the last 10-year period.

Canada bluegrass seed comes mainly from the province of Ontario in Canada. The average imports into this country have been 454 tons annually for the last 10-year period. We produce very little of this seed ourselves.

THE FESCUES

THERE are a number of fescues which are used to a greater or less extent on our golf courses. The only one that is grown to any extent for seed in this country is meadow fescue (*Festuca elatior*). From seven hundred to twelve hundred tons are grown annually and this is produced almost entirely in the State of Kansas. This fescue is used on golf courses chiefly for mixtures on fairways or on the roughs.

Red fescue (*Festuca rubra*) is also used chiefly in mixtures. It is used in mixtures for greens, tees

and fairways. No seed of this fescue is produced in this country as far as the writer has been able to find out. Some red fescue seed is produced in the province of Alberta, Canada. Practically all our seed of this species is imported from Europe.

Chewings fescue (*Festuca rubra* var. *fallax*) is a non-creeping strain of red fescue. It is adapted for the same conditions as red fescue. This fescue is also known as New Zealand fescue. Our supply comes chiefly from that country.

There are several other fescues of minor importance on the market which are adapted for mixtures for special conditions. The seed of these is nearly all imported from Europe in small quantities.

THE BENT GRASSES

THE most important grasses used in this country for golf greens are included in the bent grass group. This group includes Redtop, Rhode Island (Colonial) bent, the Creeping bents and the Velvet bents. As with the other types mentioned in this paper only the more important strains or varieties will be considered here:

Redtop (*Agrostis alba*) is much used in mixtures for greens, tees and fairways. There are no strains or selections of redtop on the market but the seed is all sold as just redtop. Experiments have shown, however, that it is possible to make selections of this grass and to get strains that are much finer than the ordinary kind in common use. It may be that in the not so distant future we may be able to develop a strain or strains of redtop that will retain the vigorous, quick-growing habit of this grass and still be of the finer quality that is so much in demand on our golf courses.

Redtop seed is produced chiefly in southern Illinois. The annual production ranges between three and nine thousand tons. Practically no redtop seed is imported.

The creeping bents (*Agrostis palustris*) make up a whole group in themselves. There are a number of very distinct strains of creeping bent in use on many different golf courses. Some of the better-known strains include Metropolitan, Washington, Virginia, Narragansett, Flossmoor, Columbia, and Seaside. Astoria and Oregon bent are two newer types which are regarded by some authorities as belonging to the true creeping bents, others regard

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them as strains of Rhode Island or Colonial bent, while still others consider them as belonging to a distinct species.

Seed of Seaside bent is produced in large quantities in the Pacific Northwest. The bent grass seed industry in that section dates back to about 1924. According to estimates by Professor Hyslop of the Oregon Agricultural Experiment Station, about 1800 to 2000 acres of this seed was harvested during the past year. The production is estimated at approximately 100,000 pounds by the U. S. Department of Agriculture.

In addition to the Seaside bent, including that going under the trade name of "Cocoos," there were about 30 acres of Oregon bent and 400 acres of Astoria bent grown in 1930 according to Professor Hyslop. A small amount of Seaside bent is also produced in Prince Edward Island, the estimated production last year being about 1500 pounds. In Rhode Island there was produced about 5000 pounds of creeping bent seed the past season.

RHODE ISLAND IS OLDEST BENT

RHODE ISLAND (Colonial) bent (*Agrostis capillaris*) is the oldest of the bents as far as production in this country goes. The production of bent seed in New England dates back to early Colonial times. Locally this grass goes under the name of Burden's grass and browntop. In other localities it is known as Fine bent. The state of Rhode Island is the chief seed producer of this grass.

The amount of Rhode Island bent seed produced in the State has varied considerably from year to year. The greatest production was probably reached about 1923 and 1924 when in the neighborhood of 125,000 pounds of seed were produced. Due to foreign competition this has fallen off until at the present time probably somewhat less than half of this amount is being produced annually. Rhode Island (Colonial) bent was also early introduced into Prince Edward Island. Later, emigrants moving from Prince Edward Island, carried seeds of this grass with them to New Zealand where it has also become well established.

The production of bent seed has become an important side line on many Prince Edward Island farms in the last few years. During the past season it is estimated that about 30,000 pounds of Rhode Island bent was produced in that province.

The growing of bent seed has increased even more extensively in New Zealand. During the fiscal year ending July 1, 1930, 890,000 pounds of bent seed was imported into this country. A large percentage of this consisted of Rhode Island (Colonial) bent from New Zealand.

At the Rhode Island Experiment station plats of Rhode Island bent grass grown from seed obtained locally, from Prince Edward Island, and from New Zealand are located side by side. From the appearance of the plats it is evident that they are all identical.

South German mixed bent, of which considerable amounts have been imported recently, can be most suitably classed in the Rhode Island bent group. In addition to Rhode Island bent it usually contains some redtop, a little velvet bent, and small amounts of creeping bent. The composition varies a great deal depending on the source from which it is obtained. Nearly all the German mixed bent seed is harvested from native stands in isolated areas in the forest regions of Germany. It is gathered by hand labor and more is harvested in years when prices are favorable.

THE VELVET BENTS

THE Velvet bents (*Agrostis canina*) make up another group which contains many different strains and selections. Velvet bents in general are characterized by their fine texture, dense turf and usually good color. Less top-dressing is usually needed than with the creeping bents, the growth is slower and so less frequent mowing is necessary. They are lighter feeders than the creeping bents, and also require less watering.

Some of the selected strains have very outstanding merits for their particular localities. Among the more important strains may be mentioned Arlington (U. S. No. 14276), Kernwood, Newport, Acme, Highland, and Mountain Ridge. The Arlington and Kernwood strains have done exceptionally well in the experiments at the Rhode Island Station and at the Arlington Experimental Farm.

The production of velvet bent seed is rather an infant industry so far. The crop in Rhode Island the past year is estimated at about 10,000 pounds. The crop in Prince Edward Island has been esti-

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PHOSPHORIC ACID (P ₂ O ₅)	2-5 - 3-0%
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BENT NURSERY AT THE RHODE ISLAND STATION

This photograph of a seed-producing stand of bent was taken August 1, 1930

mated at 500 to 600 pounds. There is a small acreage of velvet bent grown for seed in Alberta also.

BENT GRASS SEED PRODUCTION

THREE years ago the Rhode Island Experiment station started some experiments on the production of seed of bent grasses. So far as the writer is aware these are the only experiments now being conducted on bent grass seed growing. These experiments include three major divisions designated as Sections A, B, and C.

SECTION A: A comparative test of different strains and varieties of bent grasses maintained under putting green conditions.

SECTION B: A test of the seed producing ability of the most promising strains included in Section A. This test also includes the testing of the seed produced with respect to its ability to transmit the different characteristics of the grass. There are four plots of each strain or variety included in the test.

SECTION C: A fertilizer test on Rhode Island bent for seed production. This includes fertilizers of different analysis in which the percentage of nitrogen, phosphorus, and potash are varied. Four plots of each type of fertilizer are used.

In Section A where the different strains are compared under putting green conditions, a plot was left vacant next to each planted plot. Seed from the same strain grown in Section B is used for seeding half of this plot which was left vacant. On the other half of the vacant plot seed is planted from the same strain or type also, but it is seed that has been produced by plants where precautions have been taken to prevent their being crossed. In this way the original plot can be compared both with the plot grown from seed grown under field conditions and seed where we know that no crossing has taken place.

It is thought that considerable crossing may take place in the fields where different bents are found growing together. This experiment is planned to find out how general this is with the different bents. In some cases the original plots were planted with seed and in others with stolens.

The first seed crop was harvested on Sections B and C during the past season. Weather conditions were ideal and excellent yields were obtained where the most favorable fertilization was used. The yields are considerably higher than can be expected under actual field conditions since undoubtedly more seed can be saved by the hand methods used than where the seed is handled on a larger scale. This is especially true for Section B where all the seed was flailed out by hand instead of putting it through a thresher. This was done in order to eliminate as far as possible the danger of getting the seed of the different strains mixed in any way. This method of threshing also left more of the seed in the hulls.

The yields of seed per acre obtained from the different strains and varieties in Section B are shown in Table 1.

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TABLE 1. SEED PRODUCTION

Types and varieties of bent grasses—Section B.

Kind	Pounds Seed per acre*
Redtop	356
Rhode Island bent	264
Astoria bent	310
Seaside bent	143
Cocoos bent	178
Washington creeping bent	153
Virginia creeping bent	323
Metro. creeping bent	73
Arlington velvet bent	35
Kernwood velvet bent	129
Highland velvet bent	152

*Hand flailed seed. Contains more chaff than seed from Section C.

This is only the first year's results and it is too early to draw any conclusions. The test demonstrates however that all these different bents will produce satisfactory crops of seed under the right conditions.

The yields of Rhode Island bent obtained with the different fertilizer ratios used are shown in Table 2.

TABLE 2. YIELDS OF RHODE ISLAND BENT SEED

Fertilizer ratio test—Section C.

Fertilizer Ratio	Pounds Per Acre N. P. K.	Pounds Seed Per Acre
0-0-0	0- 0- 0	28.1
1-6-3	15-90-45	32.2
2-6-3	30-90-45	70.7
4-6-3	60-90-45	103.4
6-6-3	90-90-45	154.7
6-2-3	90-30-45	138.6
6-10-3	90-150-45	148.4
6-6-1	90-90-15	165.0
6-6-5	90-90-75	143.2

The yields range from 28 pounds per acre where no fertilizer was used to 165 pounds where 1500 pounds per acre of a 6-6-1 fertilizer was used. The yields are very apparently influenced, chiefly by the amount of nitrogen used. The change in the amounts of phosphorous and potash had little influence on the yield of seed.

The amount of nitrogen used for the best yields is probably higher than one would attempt to use under field conditions on account of the danger of

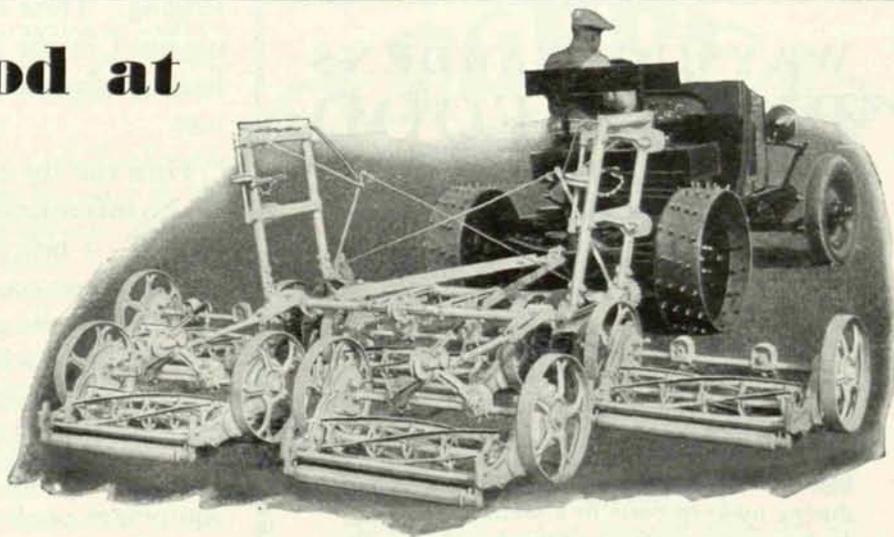
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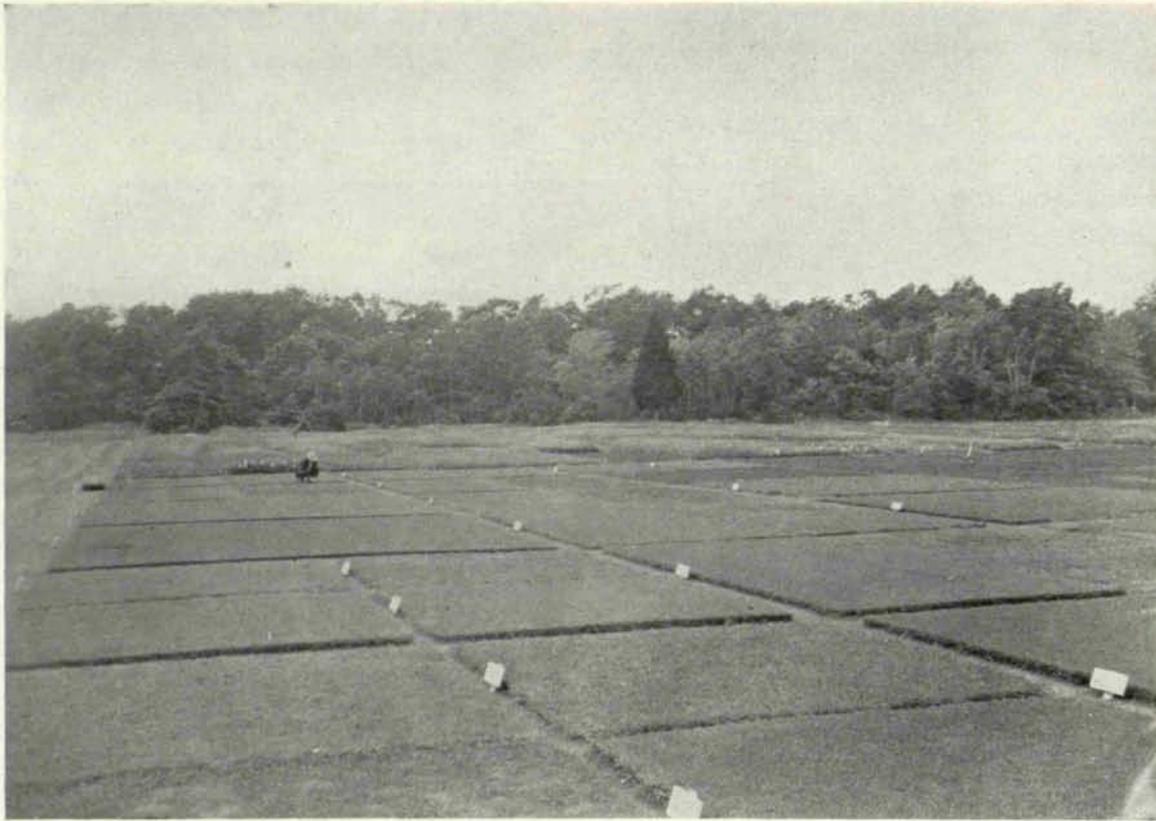
The 6-Cylinder PENNSYLVANIA Tractor pulling the PENNSYLVANIA Fairway Quint (quickly convertible)

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lodging. These experiments show that the results obtained in the production of bent seed can be largely influenced by the kind of fertilizer that one uses.

How can the greenkeeper make some direct use of this information on the seed production of bent grasses? I believe that many greenkeepers have areas on their courses where they could allow some of their favorite grass to mature, and from this obtain enough seed to plant considerable additional areas on the course. It is not necessary to produce commercially cleaned seed for each purpose. If the seed is flailed out by hand the only additional equipment needed would be a small cleaning mill. Such a mill is inexpensive and will do a good job. This should prove a practical proposition to many greenkeepers.

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