

# THE BULLETIN

*of the*

## UNITED STATES GOLF ASSOCIATION GREEN SECTION

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## Demonstration Turf Garden Reports

### Summary of Reports from Seventeen Gardens for 1932

By John Monteith, Jr., and Kenneth Welton

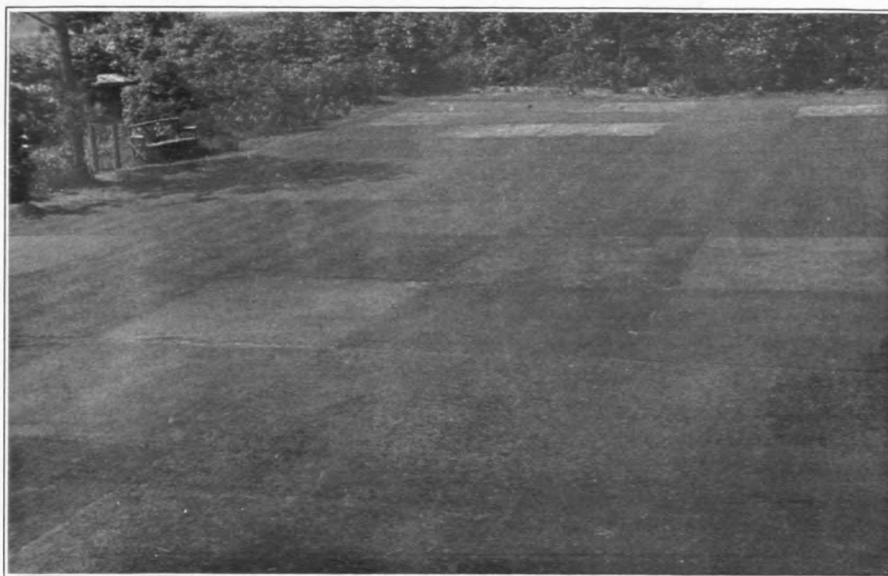
During the season of 1932 the series of demonstration gardens started in 1928 was continued. The plan of these gardens has been reported in previous numbers of the Bulletin and a summary of the first three years' results was published in the December, 1931, number of the Bulletin. The work was continued on these gardens during 1932 in much the same manner as in previous years. Due to reduced budgets some of the gardens could not be given as thorough care as in previous years, but in spite of these difficulties most of them continued to show some interesting differences between the various plots. During the summer there was held on these gardens a number of meetings of greenkeepers and chairmen of green committees. In most cases the gardens continued to serve as convenient sources of information in their vicinity for persons who are particularly interested in turf culture. Such individuals, by visiting the gardens occasionally, were able to follow any variations in the plots from season to season and could thus obtain far more information from them than could those who made only annual visits to the gardens.

Monthly reports throughout the season were received from 17 of these demonstration gardens. The locations of the 17 gardens are listed below together with the names of those who have made out the reports.

#### Demonstration Turf Gardens Cooperating With the Green Section

Allegheny Country Club.....	Pittsburgh
John Pressler and Paul F. Leix	
Century Country Club.....	Metropolitan District
Henry Shakeshaft and T. T. Taylor	
Charles River Country Club.....	Boston
F. H. Wilson, Jr.	
Detroit Golf Club.....	Detroit
Alex McPherson and M. Milenow	
Hyde Park Golf and Country Club.....	Cincinnati
William Harig and William Fruechtemeyer	
Indian Trails Golf Course.....	Grand Rapids
Floyd Metcalf, Carl Fiedler, and Robert Cullin	
Keller Golf Course.....	St. Paul
P. N. Coates and Harold Stodola	
Lochmoor Club.....	Detroit
W. F. Beaupre and Andrew Wedyke	
Meadowbrook Country Club.....	Detroit
Thomas Slessor	
Niagara Falls Municipal Golf Course.....	Niagara Falls
Frank Bulges and Albert Bulges	
Oakmont Country Club.....	Pittsburgh
Emil Loeffler	
Philadelphia Country Club.....	Philadelphia
M. E. Farnham and Herbert Murphy	
Pine Valley Golf Club.....	Clementon
G. T. Cunningham and E. R. Steiniger	
Royal York Golf Club.....	Toronto, Canada
Frank A. Hamm	
Upper Montclair Country Club.....	Metropolitan District
Stanley Davis and T. T. Taylor	
Westwood Country Club.....	St. Louis
A. J. Goetz and Al Linkogel	
Wheatley Hills Golf Club.....	Metropolitan District
Frank Krause and T. T. Taylor	

In addition to these northern gardens two demonstration gardens located on the courses of the Sedgefield Country Club, Greensboro, N. C., and the Tulsa Country Club, Tulsa, Okla., were continued; but these two gardens were planted on a different plan, to provide information on the golf course problems of a somewhat different grass belt than that of the gardens listed above.



A view of the demonstration turf garden on the course of the Pine Valley Golf Club, Clementon, N. J., showing some striking differences between plots. This garden is planted on sand, where the absence of plant food materials in the soil accentuates the differences in turf on the plots due to the addition of various fertilizers. Where the gardens are planted on richer soils these differences are by no means as conspicuous as they are here

The information obtained from the 17 northern gardens in the form of monthly reports has been consolidated in accordance with the method outlined on pages 232 to 235 of the December, 1931, number of the Bulletin. The plots were rated numerically from 1 to 4; 1 representing *poor* turf, 2 representing *fair* turf, 3 representing *good* turf, and 4 representing the plots with *excellent* turf. The numbers in the columns under each month in the tables represent the consolidation of these ratings from the 17 gardens. The totals for the six months are given. The last column gives the total rating in terms of percentage of the total perfect score. The total score has varied from year to year, depending on the number of gardens which have contributed to the ratings, but the percentage ratings can be directly compared with those of previous years as given in the December, 1931, number of the Bulletin.

#### Putting Green Fertilizer Ratings

The putting green fertilizer tests were made on German mixed bent turf, except at the St. Louis garden where Metropolitan creeping bent was used. The fertilizers were applied at such rates that each fertilizer plot received the same total amount of nitrogen. The

check plots were continued without any addition of fertilizers.

The two complete inorganic fertilizers which have headed the lists in the three preceding years were again the leaders in 1932. The 6-12-4 mixture again had a slight advantage over the 12-6-4, as in 1930 and 1931.

Ammonium phosphate and poultry manure were tied for third place, decidedly behind the two complete mixed fertilizers. The poultry-manure plot averaged seventh place in the preceding years, while the ammonium-phosphate plot ranked in fourth place for the same period.

The sulphate-of-ammonia plot, which has been rated above the ammonium-phosphate plot in the average ratings for the three preceding years, has been rated slightly below it this year.

The activated-sludge plot, which in 1931 headed the list of organic fertilizers, this year fell somewhat below the poultry-manure rating, ranking sixth.

PUTTING GREEN FERTILIZER RATINGS, ON GERMAN MIXED BENT TURF, FROM 17  
DEMONSTRATION GARDENS DURING 1932

(The order given is from highest to lowest rating for the year)

	May	June	July	Aug.	Sept.	Oct.	Total	Percent- age
6-12-4 .....	54	57	64	61	59	62	357	88
12-6-4 .....	53	58	62	60	56	58	347	86
Ammonium phosphate.....	49	49	52	55	53	53	311	77
Poultry manure.....	44	49	58	54	52	54	311	77
Sulphate of ammonia.....	47	49	55	51	52	53	307	76
Activated sludge.....	40	45	56	49	51	51	292	72
Urea .....	41	45	52	51	46	52	287	71
Sulphate of ammonia and compost..	45	49	49	43	49	46	281	69
Lime and sulphate of ammonia...	38	43	50	46	47	50	274	67
Nitrate of soda.....	37	36	45	38	38	45	239	59
Bone meal.....	32	36	41	43	43	42	237	58
Check 5-A (no fertilizer).....	23	25	27	28	29	25	157	38
Check 6-C (no fertilizer).....	25	23	26	29	29	25	157	38
Check 4-C (no fertilizer).....	22	22	22	26	26	23	141	35
Check 5-E (no fertilizer).....	23	22	21	23	26	24	139	34

Urea in 1932, as in the preceding year, ranked seventh.

The plot receiving sulphate of ammonia and compost was in eighth place during the season, as compared with fifth place in 1931. In this plot half of the nitrogen is obtained from sulphate of ammonia and the other half from compost.

The plot receiving both lime and sulphate of ammonia again is in ninth place, as it was in 1929 and 1931. A comparison of this plot with the plot receiving sulphate of ammonia alone gives further evidence that lime was not needed on most of the soils where these gardens are located, at least not at the rate at which it was applied to this plot.

The nitrate-of-soda and bone-meal plots were rated tenth and eleventh respectively, as they have been in the three preceding seasons.

The 4 check plots which received no fertilizers continued to receive low ratings in 1932. There was a difference of only 4 per cent between the ratings of the 4 check plots, which indicates that there is little variation of the soil in the series of fertilizer tests.

## Fairway Fertilizer Ratings

The fairway fertilizer series was conducted on turf derived from a seed mixture of 80 per cent of Kentucky bluegrass and 20 per cent of redbtop. As in the case of the putting green series, the nitrogen fertilizers were applied at such rates that each plot received the same quantity of nitrogen. The total application of nitrogen for the season in the fairway series was half that used in the putting green series. Applications were made in the spring and in the fall.

## FAIRWAY FERTILIZER RATINGS ON MIXED TURF OF KENTUCKY BLUEGRASS AND REDTOP FROM 17 DEMONSTRATION GARDENS DURING 1932

(The order given is from highest to lowest rating for the year)

	May	June	July	Aug.	Sept.	Oct.	Total	Percent- age
6-12-4 .....	45	43	41	42	45	47	263	68
Bone meal.....	37	41	43	42	47	47	257	66
12-6-4 .....	49	43	40	37	42	45	256	66
Activated sludge.....	44	38	44	40	46	43	255	66
Sulphate of ammonia.....	37	33	31	33	39	39	212	55
Lime .....	27	32	35	36	37	32	199	51
Manure .....	28	32	32	36	33	31	192	49
Check 10-C (no fertilizer).....	25	26	28	30	30	30	169	44
Check 11-E (no fertilizer).....	22	23	25	29	26	28	153	39
Check 11-A (no fertilizer).....	22	25	24	25	24	24	144	37

There was a difference of only 2 per cent in the ratings of the 4 leading plots in this series, and these were the same plots as those that were in the 4 highest positions in 1930 and 1931. The inorganic complete mixed fertilizer 6-12-4, which received the highest rating in 1929 and 1930 and which dropped to second place in 1931, again headed the list in 1932. The second, third, and fourth positions represent only slight differences. In spite of the 2-point difference in the total score the percentages were the same when the fractions were ignored. Bone meal and the inorganic mixed fertilizer 12-6-4 were second and third respectively during the past season, as compared with third and fourth places respectively in 1931. Activated sludge this year received fourth place, as compared with first place in 1931. The difference of only 2 per cent in the first four places, however, indicates that there was practically no difference in quality of turf during the fourth year between these four fertilizers. The lime plot this year for the first time since the establishment of the gardens rated somewhat above the manure plot.

In comparing these ratings with those of the preceding year it is interesting to note that all of the 3 check plots received a decidedly lower rating in 1932 than in 1931. There was a decidedly higher rating given in 1932 than in 1931 to all of the plots which received fertilizer or lime, with the exception of the plot receiving manure, which received a slightly lower rating than in 1931. This gives an interesting demonstration of the influence of different seasons on fertilizing programs.

## Putting Green Grass Ratings

In the table of putting green grass ratings the grasses tested at the turf gardens are grouped according to botanical relationship, and within the groups they are listed in order of favorable ratings.

The colonial bent plots which were planted with seed grown in three different regions have received similar ratings during the four years in which the gardens have been in use. There has been some shifting in the relative positions each year, which is to be expected with ratings so close. This year the results further emphasize the previous results in showing that the quality of turf produced by this species of bent varies but little according to the place where the seed is grown.

PUTTING GREEN GRASS RATINGS FROM 17 DEMONSTRATION GARDENS DURING 1932

	May	June	July	Aug.	Sept.	Oct.	Total	Percent- age
Colonial bent:								
Western grown.....	47	50	49	48	52	48	294	73
New Zealand grown.....	47	50	48	48	52	45	290	72
Rhode Island grown.....	44	49	47	49	50	46	285	71
Creeping bent:								
Seaside (seed).....	45	56	53	51	52	52	309	76
Metropolitan (stolons).....	45	49	53	52	54	51	304	75
Washington (stolons).....	45	46	51	47	56	54	299	74
Virginia (stolons).....	31	36	38	37	35	34	211	52
Columbia (stolons).....	35	36	32	36	36	35	210	52
Velvet bent:								
No. 14276 (stolons).....	41	44	51	52	51	48	287	71
Prince Edward Island grown (seed).....	46	52	49	49	48	42	286	71
Highland (stolons).....	40	42	45	48	45	44	264	65
Rhode Island grown (seed)....	41	46	44	42	45	37	255	63
Mixed bent (German).....	47	49	46	50	51	43	286	71
Fescue:								
Chewings.....	31	32	27	25	27	28	170	42
Red.....	27	32	25	24	24	26	158	39
Annual bluegrass.....	33	40	38	26	32	34	203	50

Seaside creeping bent for the first year since the establishment of the gardens leads the list of creeping bents. As in previous years, there was only a slight difference in the ratings of the three leading creeping bents (seaside, Metropolitan, and Washington). This year there was a difference of only 2 per cent between the three best creeping bents as contrasted with a difference of 22 per cent between the Washington strain and the Columbia or Virginia strains. This wide difference shown year after year between the group of better creeping bents and the poor strains emphasizes the well-known fact that creeping bents for turf purposes can not be regarded as identical in spite of the common opinion among golfers that creeping bents are all the same. The group of best creeping bents is again slightly ahead of the group of colonial bent and German mixed bent plots, which represents the type of turf which golfers so frequently refer to simply as "seeded greens."

The two best velvet bents, one planted with seed and the other with stolons, received practically the same ratings as German mixed bent and the colonial bents. The plot planted with velvet bent seed grown in Rhode Island did not rate as high as the plot planted with seed grown on Prince Edward Island.

The fescue plots again received the lowest ratings of all the grasses used in the putting green series.

The annual-bluegrass plot again was somewhat better than the fescue plots. It received a slightly lower rating than in 1931.

## Fairway Grass Ratings

FAIRWAY GRASS RATINGS FROM 17 DEMONSTRATION GARDENS DURING 1932

	May	June	July	Aug.	Sept.	Oct.	Total	Percent- age
Kentucky bluegrass, redtop, and German mixed bent.....	45	51	50	50	57	57	310	76
Chewings fescue and German mixed bent .....	47	49	50	49	48	52	295	72
Colonial bent.....	43	45	47	45	50	51	281	69
Kentucky bluegrass, redtop, and Chewings fescue.....	44	45	46	46	48	47	276	68
Kentucky bluegrass and redtop....	42	42	44	43	45	43	259	63

The mixture of Kentucky bluegrass, redtop, and German mixed bent headed the list of fairway grasses during 1932. In the 3 preceding years this plot has been second only to the mixture of Chewings fescue and German mixed bent. This latter mixture, which headed the list in the 3 preceding years, dropped to second place in 1932. The 2 plots which were given a third- and fourth-place rating this year were in reverse order in 1931. The Kentucky-bluegrass-and-redtop mixture is again at the foot of the list, as it has been in the 3 preceding years.

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Plagues of locusts in the Old World have been recorded since Biblical times, and they still constitute a great problem. The insect is now causing wide-spread damage throughout northern Africa and the Near East. Entomologists of the Hebrew University at Jerusalem are making an intensive study of its control. Fortunately its presence in vast swarms is only periodical. It appears now that the breeding places of the insects are in the moderately moist borderlands of deserts, and that a bad locust year is always preceded by a decidedly rainy winter, giving the ground where the eggs are laid plenty of water in its upper layer. The eggs require from two to four weeks for hatching. After the eggs hatch the insects pass through five larval stages, growing larger each time they shed their skins, and beginning their migratory march. During this early stage in their life the swarm will travel by hopping or very short flights above ground. In this stage the insects can be fought by poisoned baits, by trenching, and by various other mechanical and chemical means. When, however, they have grown their long wings and taken to the air, no method so far devised can avail to stop them.

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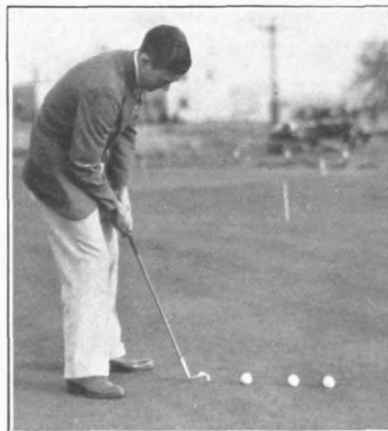
If you are troubled with Japanese beetles in your turf and have wild carrots anywhere on your course it will pay you to let the latter spread. Though regarded as a weed and despised by farmers and dairymen all over the country, the wild carrot has proved its worth in affording a home and food for an insect which destroys the Japanese beetle. This is a small wasplike insect introduced from Japan some years ago, along with other insects which prey upon the Japanese beetle, in the campaign which the Bureau of Entomology is waging against the beetle. Over 140 colonies of this insect have been released, mostly in the area around Philadelphia. It is the purpose to spread the insect to all parts of the Japanese beetle territory.

## Putting Tests Upon Bent Grasses

By John Monteith, Jr., and Kenneth Welton

In this number of the Bulletin the ratings are given of various grasses to be used for putting green purposes based on a summary of reports on a series of demonstration turf gardens. The reports from these gardens that have been summarized over a period of 4 years have been based on ratings which have been assigned by greenkeepers and others interested in the maintenance of turf. From the greenkeeping standpoint such summaries are instructive in that they show how these various grasses respond to varying greenkeeping practices under a wide range of soil and climatic conditions. The rating of the grasses in the demonstration turf gardens is based on factors which are regarded as the important features of putting green turf by those who make out the reports.

The final test of any putting green grass is its ability to produce a good putting surface which at the same time is durable. The plots of different grasses at the demonstration turf gardens were neces-



Billy Burke (left) and Johnny Farrell (right) testing the putting qualities of turf at Arlington turf garden

sarily made too small to provide a large enough area for a good test of putting qualities. At the Arlington turf garden and at the Mid-West turf garden, however, the Green Section has provided plots of the important turf grasses which are sufficiently large to provide good tests of putting qualities. At the Mid-West turf garden these plots are on a uniform grade. At the Arlington turf garden 1/3 of each plot is on a 6 per cent slope, 1/3 on a 3 per cent slope, and the remaining 1/3 is on a 1 per cent slope. These 3 different grades furnish an opportunity to test the influence of the grass on putting on quite different slopes. These plots have been in turf for several years and have aroused much interest among golfers who have visited them, for they give a fair comparison of the different grasses for putting green purposes. Many of the opinions for and against some grasses are unfortunately unreliable, because they are based on comparisons of grasses grown on different courses and often under quite different conditions. The cultural methods as well



as soil conditions greatly influence the quality of the turf produced by any grass on two different courses, and therefore comparisons of grasses on various courses usually leads to erroneous conclusions. Furthermore, much of the criticism of grasses is misleading since few golfers recognize the difference between the different species of grasses, much less the different strains within a single species. Consequently there have been many generalizations which have merely added to the confusion when those interested in turf problems have tried to arrive at any conclusion as to just what kind of grass golfers prefer.

Many of the golfers who have visited the two Green Section turf gardens have expressed opinions on the relative merits of the different putting green grasses which were not in accord with many of the popular opinions as to their putting qualities. It was therefore decided to invite some good golfers to rate the putting qualities of the grasses at Arlington and to compile the ratings, with the hope that such positive opinions might serve as a guide in formulating some definite opinions as to the type of turf which golfers prefer for putting green purposes. At the time of the National Capital Open held in November at the Kenwood Golf and Country Club, near Washington, a number of the professionals in attendance visited the Arlington turf garden and putted on the different grasses and then chose those which they considered the three best. The ratings are consolidated in the table below.

	1st choice	2nd choice	3rd choice
Velvet bent.....	10	—	—
Metropolitan creeping bent.....	—	3 ½	1 ½
Washington creeping bent.....	—	2 ½	3 ½
Colonial bent.....	—	2	3
German mixed bent.....	—	1	1
Seaside creeping bent.....	—	1	1
Virginia creeping bent.....	—	—	—
Columbia creeping bent.....	—	—	—

Two varieties of bent did not receive a single vote. The Metropolitan and Washington were considered by one golfer as of equal putting quality for second choice. Therefore in preparing the table this vote was divided to give each grass one-half for second and one-half for third place. The colonial and German mixed bent plots in two other cases were considered as of practically equal merit for third place, and in making the table each of these votes was given a value of one-half.

The series of putting green plots includes 10 representative grasses, namely, velvet bent (strain No. 14276), colonial bent, German mixed bent, fescue, annual bluegrass, and the following creeping bents: seaside, Washington, Metropolitan, Virginia, and Columbia. During the previous summer the fescue and the annual bluegrass plots had been badly damaged and the turf had not fully recovered at the time this test was made; therefore they were not considered in the ratings. The test was confined to 8 plots of bent, 5 of which (velvet bent, Metropolitan, Washington, Virginia, and Columbia creeping bents) had been planted with stolons, while 3 plots (colonial bent, German mixed bent, and seaside creeping bent) had been planted from seed. Some of these bents had occasioned much more difficulties in maintenance during the summer months than had

the other bents, but all scars had recovered by the time the tests were made and the grass in all of the plots was in excellent condition. Therefore the test actually represents a comparison of the different bent grasses in topnotch condition. Recent heavy rains had made the ground somewhat soft, so that footprints were more in evidence than usual, but these were not serious enough to noticeably affect the putting. The 10 professionals who cooperated in making this test were as follows: Tom Boyd, Billy Burke, Wiffy Cox, Abe Espinosa, Johnny Farrell, John Flattery, John Golden, Tom Kerrigan, Willie Macfarlane, and Horton Smith.

These players unanimously chose velvet bent as the best putting surface. This velvet bent is a selection that was planted with stolons. The second and third choices were much more difficult to make. It is interesting to note that two creeping bents (Metropolitan and Washington) took second and third places, respectively, in the estimation of this group of players. Colonial bent was given fourth place and German mixed bent (which in this plot is chiefly colonial bent with a small amount of velvet bent appearing in only small patches) was tied with seaside creeping bent for fifth place. The two other bents (Columbia and Virginia), although at the time in as good condition as it seemed possible to get them, were not placed among the three best by a single player.

Since seasonal conditions have a decided influence on these different grasses it is most likely that this same group of players would have rated the grasses somewhat differently at other times during the season when some of the grasses were not in as good condition as they were at the time this test was made. Similar tests throughout the season would give a far more definite rating to these grasses. Nevertheless they are interesting in showing the unprejudiced opinions of good players based on a comparison of the grasses when they were all in good condition.

It is interesting to compare this table of ratings with the ratings obtained from greenkeepers based on the performance of the grasses from the greenkeeping standpoint, as indicated in the table on page 222 of this number of the Bulletin and in the summary of the demonstration gardens over a three-year period in the December, 1931, number of the Bulletin. The greenkeepers' ratings of the grasses over a period of four years have given the highest rating to three creeping bent grasses in the following order: Metropolitan, seaside, and Washington. The group of colonial bent grasses and the German mixed bent (which is chiefly colonial bent) have been given similar ratings by the greenkeepers over a period of four years. Their position is just below the group of three best creeping bents. The strain of velvet bent used for this putting test is rated in the demonstration gardens by greenkeepers in a position somewhat below the colonial bent group. The lower rating of the velvet bent by the group of greenkeepers as compared with the group of professionals was due to the fact that the greenkeepers' ratings were lowered by the difficulty in securing and maintaining a good stand of this grass throughout the years in which the reports have been made. It must be remembered that the professionals rated the velvet bent when it was at its best and they did not have to make any allowance for the difficulties in keeping it in this condition. Aside from the rating of velvet bent it is indeed encouraging to note that the ratings of the greenkeepers and the players are so closely in accord.

Many times one hears the criticism that those interested in the maintenance of courses judge grasses with different standards than do the good golfers. This is not borne out in the comparison of the ratings made with the two different standards in mind. In many cases the differences between the viewpoints of the golfer and greenkeeper are not due to different standards but due to a failure of many of the critical golfers to distinguish between different grasses.

One of the common mistakes among golfers, and indeed unfortunately also among greenkeepers and others whose business it should be to know more about such matters, is due to the common classification of turf by the golfers into two classes—seeded greens and stolon greens. A seeded green may be seeded to a number of grasses such as redbtop, fescue, colonial bent, seaside bent, mixed bents, or other grasses. In this arbitrary division, however, most golfers refer to seeded greens as meaning greens seeded either with colonial bent or German mixed bent. When one refers to stolon greens it usually brings to the mind of the golfer the greens of Virginia creeping bent, since this strain has been used most widely for planting greens with the stolon method.

It is interesting to note that this group of players placed three grasses planted with the stolon method at the head of the list, followed by three bents planted with the seeded method. The Virginia creeping bent planted with stolons which was most widely used commercially in this country did not receive a single favorable rating even though it was in excellent condition. This clearly indicates that, for putting purposes, the players can readily distinguish between the different strains of creeping bent. The Columbia and Virginia strains, against which the players discriminated, made an equally unfavorable showing in the ratings of the demonstration gardens. These ratings add further evidence to prove how meaningless are the criticisms of individuals who recognize only the two types of putting green turf—seeded and stolon.

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**Parasitic control of injurious insects.**—In the Government laboratory at Brownwood, Tex., the Bureau of Entomology has propagated a tiny insect, which is hardly visible, for the purpose of helping control the nut case-bearer, an insect pest prevalent in the pecan groves of the South. The little insect, known as *Tuchogrammo minutum*, produces twins and multiple sets of twins inside the eggs of other insects. It is planned to raise the insects in large quantities for liberating in orchards to determine the possibility of controlling the oriental fruit moth also. At Moorestown, N. J., two small wasplike insect parasites are also being propagated as a possible control of the fruit moth. These wasps lay their eggs in the grub of the moth, and as the wasp grub matures inside the moth grub the latter is devoured. Parasites of a similar nature are also being tried on the codling moth, which produces worms in apples. This method of checking insect damage on golf courses is being thoroughly tested in the vicinity of Philadelphia, where new parasitic insects are being propagated to prey on the grubs of the Japanese beetle.

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In general it is true that the more fertile the soil is kept the fewer weeds will infest the turf.

### 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. If your experience leads you to disagree with any answer here given it is your privilege and duty to write to the Green Section. While most of the answers are of general application, it must be borne in mind that each recommendation is intended specifically for the locality designated at the end of the question.

**Economy in the use of known chemicals in place of proprietary fungicides in brownpatch control.**—We are having quite a bit of trouble here in southern Texas from brownpatch in the winter grass on our Bermuda greens. Practically every golf course of importance here has planted its Bermuda greens with redtop and bluegrass. We have had no trouble in San Antonio with bluegrass but have had quite a bit of trouble with redtop. We have been spraying our greens every ten days with \* \* \*, a proprietary brownpatch remedy, but find this rather expensive. Is there any preventive we could use as a spray or a topdressing which would keep our winter grass healthy and yet not be so expensive as this proprietary preparation? (Texas)

**ANSWER.**—You can control brownpatch much more economically by using corrosive sublimate than by using the preparation you mention. There is a little more danger of burning grass with corrosive sublimate than with that preparation, but since the pure chemical is so much more effective it should be used in smaller quantities. We have found that 2 ounces of corrosive sublimate contain approximately the same amount of mercury as 1 pound of the preparation referred to. The control of brownpatch is determined by the mercury content of the fungicide employed. Therefore, in cases where you have found 1 pound of the fungicide you have been using effective, we would advise you to try 2 ounces of corrosive sublimate. This can be applied best when mixed thoroughly with a pail or two of slightly moist soil. The soil makes it possible to distribute the chemical more evenly; but it is essential that the corrosive sublimate be mixed very thoroughly with this soil for obtaining an even distribution. As soon as the chemical is applied it should be watered in with a light sprinkling, care being taken not to use an excessive amount of water since that would tend to wash the chemical down into the low areas on the green. In addition to its mercury content the preparation you have been using contains a fertilizer rich in nitrogen. One pound of this preparation contains nitrogen equivalent to approximately 1 pound of sulphate of ammonia. Therefore, if your greens are in need of nitrogen they will get a stimulation from the application of the material you have used which they will not get from an application of corrosive sublimate alone. This form of nitrogen, however, can be bought much more economically in the form of sulphate of ammonia or some other regular fertilizer. Many of those who use combinations of fungicides and fertilizers get the impression that they are getting control of brownpatch when, as a matter of fact, all they are getting is a stimulation of growth by the

application of nitrogen. We therefore feel that it is necessary to warn users of such combinations to try fertilizers in addition to fungicides in order to determine whether or not the benefit from the use of the preparation is due merely to its stimulating the growth of the grass.

**Treatment of putting greens on alkaline soil infested with crabgrass and other weeds; use of sulphate of aluminum and gypsum.**—A test of the soil of our putting greens shows that it is neutral in reaction. The greens are full of clover and have much crabgrass, and the finer grasses of which we have sowed seed from time to time do not thrive on account of this lack of acid soil. What would you suggest as a safe and reasonably quick method of making the soil slightly acid? We are informed that sulphate of aluminum or acid phosphate will effect such a change more quickly than sulphate of ammonia. It has also been suggested that the use of gypsum in place of lime will keep the soil friable without making it alkaline. (Pennsylvania)

**ANSWER.**—Our advice is that you use nothing but sulphate of ammonia for making your soil slightly acid. Sulphate of aluminum, while it makes soils acid and is suitable to use with some plants, is harmful to grass. Acid phosphate does not materially affect the acidity of the soil. The name of this fertilizer is often misinterpreted to mean that it has an acid reaction on soil, and to avoid such wrong impressions the trade has adopted the name superphosphate to replace the name acid phosphate. There is practically no evidence that gypsum will be of much value in soil for bent grasses. Good bent grass can be grown on a soil slightly alkaline if it is fertilized frequently. Frequent applications of sulphate of ammonia will greatly retard the growth of clover even though the soil be slightly alkaline. In controlling crabgrass it is suggested that you weed it all out by hand before it has a chance to seed on your greens. Crabgrass seeds freely, and unless the plants are removed before they are permitted to produce seed they will sow the green for another crop of crabgrass the following year. You should also see that your topdressing material is kept free from crabgrass seed. Frequently compost piles are allowed to become covered with crabgrass, which goes to seed and thus contaminates the topdressing material.

**Fertilizing the putting green bed before planting.**—What are your suggestions as regards fertilizing a putting green bed before planting? We are wondering whether it would be better to use sulphate of ammonia or some prepared formula of about 10 units of nitrogen, 8 units of phosphoric acid, and 6 units of potash? Our soil is a good sandy loam. (Illinois)

**ANSWER.**—In fertilizing a putting green bed preparatory to seeding or planting stolons it is recommended that a prepared fertilizer be used having a comparatively high percentage of nitrogen, considerable phosphoric acid, and some potash. A 10-8-6 fertilizer, such as you mention, should be very good. This should be applied at the rate of 40 to 50 pounds to 1,000 square feet and raked into the soil during construction. As your soil is a sandy loam it is recommended that you use, if possible, a fertilizer with an organic base.

**Controlling weeds with sulphate of ammonia.**—We are sending you a specimen of a weed which is invading our putting greens. Please let us know what the weed is and whether or not we can control it with applications of sulphate of ammonia. To attempt to dig it out by hand would doubtless be too expensive. (Quebec)

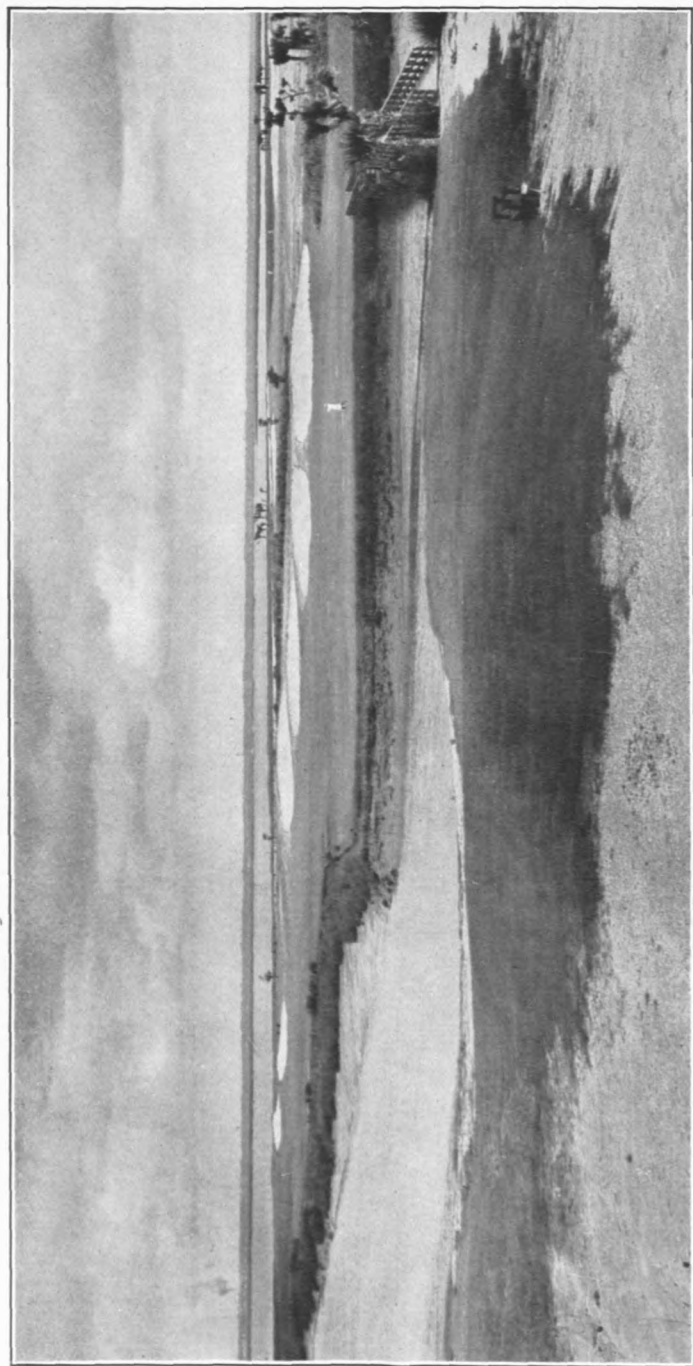
ANSWER.—The weed you send is creeping buttercup. Most of these large-leaved plants are likely to be checked if they are treated repeatedly with heavy applications of sulphate of ammonia. This forces the growth, and when the greens are cut closely the leaves of the plant are likely to be cut off. This treatment gradually weakens the plant. The process is, however, a gradual one, and it will probably be necessary to repeat the operation a number of times. In your locality it would probably be better to undertake this treatment in the spring than in the fall, since the forcing of turf grasses late in the fall by application of sulphate of ammonia renders them more susceptible to damage from snowmold over winter.

**Controlling crabgrass in putting greens.**—Do you know of any chemical that will quickly rid a putting green of crabgrass? (Wisconsin)

ANSWER.—We do not know of any such chemical that can be used with safety. If your greens are infested with crabgrass they should be thoroughly weeded by hand to prevent the grass from reseeding. Much of the crabgrass on putting greens comes from seed which is carried in the compost used for topdressing purposes. It is therefore suggested that you examine your topdressing material to make sure it is kept free from weeds that are going to seed. This can be done by thoroughly composting the material, or by plowing and keeping fallowed a piece of land in the rough. It is very important that no weeds of any kind be allowed to go to seed in the immediate vicinity while this soil is in the process of preparation. If one removes the crab grass from his greens before it seeds, protects the greens from surface wash which is likely to carry weed seeds, and uses only topdressing which is free from weed seeds, he should have little trouble with crabgrass.

**Ridding bent greens of clover.**—One of our bent greens is almost completely overrun with clover. What can we do to get rid of it? (Georgia)

ANSWER.—Heavy spring and fall fertilizing gets the grass off to a good start in the spring and fills it in well in the fall after the summer setback; in this way the grass is able to offer considerable competition against clover. Nevertheless, once patches of clover become established it is necessary to treat them in a drastic manner. If you do not wish to cut out the clover and replace with pure turf, the best alternative is to dust the patches of clover with sulphate of ammonia early in the morning while the dew is still on the grass. Later in the morning it will be found that the clover leaves are turning yellow. At this time it is well to sprinkle the green in order to prevent the sulphate from burning the grass too severely. Frequent treatments of this kind will destroy the clover and replace the bent, as the bent will come back quickly.



Thirteenth hole (375 yards), Sea Island Golf Club, Sea Island Beach, Ga. Tee in foreground, putting green at extreme left



**To most men experience is like the stern  
lights of a ship, which illuminate only the  
track it has passed.**

**Samuel Taylor Coleridge**

