

Reviewing
THE LIBRARY OF GRASS
And How to Answer Each Green Problem as it Appears

The Green Section has collected and published a large store of information on golf course construction and maintenance. This index can include only a small proportion of the index in the Green Section files. Requests for further information on these or related subjects will be welcomed from member clubs.

The figures given in the index refer to volume and page of "The Bulletin of the United States Golf Association Green Section." References to a few special summaries are underscored.

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*Various systems of keeping cost accounts are used on golf courses. The Bulletin from time to time has presented typical and effective accounting systems. The Green Section has not been concerned so much with the particular system as with the principle of keeping records to bring out clearly the savings that are made in course upkeep by the use of certain new or improved maintenance methods.

* * *

* Ants are difficult pests to control on putting greens. In the course of years many questions have been answered on this subject. A summary of control measures has recently been issued by the Green Section in "Comments on Turf Culture, Vol. 2, No. 2.

* * *

* The arsenate of lead treatment for the control of turf pests is an example of the advantages to golf clubs offered through the cooperative research work of the Green Section with the U. S. Department of

"It is only necessary to read the very adequate reports of the United States Golf Association on the research and the results achieved by their greenkeeping section to recognize how far behind we are in this country in the direction of coordinated knowledge in all that affects good greenkeeping. . . . There is no direction in golf where joint action should be more fruitful of benefit to the game than well-informed experience on the result of greenkeeping experiments."
SCOTLAND, 1928

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Agriculture. Although the use of
 this chemical was developed for the
 specific control of the Japanese
 beetle in a limited section of the
 country, it was later found to be
 applicable to a wide range of golf
 course conditions and effective
 against several important insect
 pests. In less than ten years after
 experiments were begun with arsenate
 of lead it became one of the common
 remedies used for golf course turf.

* * *

* Bermuda grass is the most im-
 portant turf grass of the South. The
 Green Section has obtained and dis-
 tributed much valuable information
 concerning the maintenance of this
 important grass as well as the tem-
 porary grasses that supplement Ber-
 muda grass turf for winter play.

* * *

* Birds should be encouraged on
 golf courses not only because they
 enhance the beauty of a course but
 because they aid in maintenance.
 Most of the birds feed primarily on
 bugs and seed; thus, they reduce many
 of the insects and weeds that are
 objectionable in turf. The Bulletin
 has offered many suggestions on how
 to encourage desirable birds on golf
 courses.

* * *

* Brownpatch only fifteen years ago
 was a turf ailment for which there
 was no remedy. The systematic study
 of this disease under the direction
 of the Green Section has provided
 clubs with information and remedies
 which have tremendously reduced the
 damage from brownpatch. The fungicides
 and special cultural practices based
 on this study have been adopted gener-
 ally throughout the United States and
 by foreign courses where the disease
 is prevalent. Corrosive sublimate and
 other mercury fungicides were first
 advocated by the Green Section.

* * *

*Calomel as a fungicide for the

"Several years ago we had a very great deal of trouble with our greens and
 lost several of them completely. The Green Section responded immediately to our
 call for help and was of inestimable value to us in advising and helping us in
 our trouble." VIRGINIA

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control of browmpatch, dollarspot
 and snowmold was developed by the
 Green Section at the Arlington turf
 garden. This was the first use of
 calomel for the control of a plant
 disease. It has since been used as
 a means for controlling certain
 diseases of agricultural crops.

* * *

* A large assortment of chemicals
 has been tested to determine their
 value for fertilizing turf and for
 controlling diseases, insects and
 weeds. Few important golf courses
 in this country are maintained with-
 out the use of some of the chemicals
 that have been tested by the Green
 Section. The testing of chemicals
 has supplied clubs with information
 as to their effectiveness for the
 purpose for which they are used as
 well as to the possibilities of
 harming the turf grasses.

* * *

* Clover is one of the most per-
 sistent weeds in golf turf. The
 experimental work of the Green Sec-
 tion has brought out clearly the
 importance of a liberal use of
 readily available nitrogenous fer-
 tilizers in the control of clover.
 Experimental work now in progress
 promises to give clubs much more ef-
 fective measures for checking this
 plant.

* * *

* Many of the difficulties exper-
 ienced in maintaining putting greens
 may be eliminated or greatly reduced
 by using a better grade of top-dressing.
 The importance of good compost has
 long been stressed by the Green Section.
 Information has been obtained and
 distributed as to the most effective
 mixtures for compost and the methods
 to be used in handling it to eliminate
 weed seed.

"The work you have undertaken is the most worth while of any golf activity
 that has been brought to our attention." MICHIGAN

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* Crabgrass is another of the com-
 mon weeds of golf turf. The control
 of this pest involves quite dif-
 ferent methods than are used to check
 clover. It has been shown that to
 check crabgrass it is essential to
 give close attention to such matters
 as weeding, weed-free top-dressing,
 height of mowing, watering and fall
 fertilizing.

* * *

* Cutworms and other worms that
 feed on grass destroy putting sur-
 faces. They are controlled by
 sprays of arsenate of lead and by
 poisoned baits. The Green Section
 staff has been able to provide many
 useful services to golf clubs
 through the development of control
 measures for these pests.

* * *

* Fairways make up the largest
 part of the golf course maintained
 in good turf. Improvements in fair-
 way turf have been outstanding dur-
 ing the past 10 years and the Green
 Section has had an important part
 in these improvements through its
 study of suitable grass mixtures,
 fertilizing programs, height of
 cutting tests, weed eradication and
 similar work.

* * *

* A large assortment of fertili-
 zers have come into general use on
 golf courses since the days of
 manure mulches. The most effec-
 tive and economical use of fertili-
 zers for turf requires information
 as to general fertilizing principles
 as well as specific information.
 Green Section work in this field has
 led to the adoption of many of the
 now common fertilizing practices.

"The formula for our general fertilizer prepared by them (the Green Section)
 is giving fine results, and incidentally has saved the Club approximately
 \$500.00." SOUTH CAROLINA

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* The grasses planted on the golf courses of the United States originated in all parts of the world. The kind and quality of the grass affect the maintenance cost as well as the popularity of the game. The proving of a large number of grasses for greens, fairways, tees and rough under various types of soil and conditions of climate has constituted a considerable part of the Green Section work. Grass growing on a golf course is of necessity growing under highly artificial conditions which have only been aggravated by modern improvements and rising turf standards. The Green Section has supplied technical help to overcome this turf handicap.

* * *

* Grubs are particularly partial to the fine turf used on golf course greens which stands out as an island of green in a sea of brown during dry weather. The control of grubs by applying arsenate of lead is now well known to the greenkeeper. The earliest experiments with this poison for turf insect control were reported in the Green Section Bulletin.

* * *

* Humus is doubly important in soils devoted to the growing of turf for golf since it improves the fertility and water-holding power of the soil as well as imparting a springiness or resiliency which minimizes packing and assists in the holding of a pitched ball. Much of the value of compost is due to the amount of humus it contains. Several important investigations on the improvement of soils for greens and fairways have been accomplished by the Green Section.

"Our greens were as bad as any in this country, while for the past few years they have been acknowledged as superior to any within a radius of several hundred miles, which improvement is due to the practical application of methods recommended by the Green Section. . . . WEST VIRGINIA

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* Kentucky bluegrass is the main-
 stay of northern fairway turf. The
 harmful effect of close clipping of
 bluegrass has been decisively proven
 by Green Section investigators.
 Experiments have also shown that
 clover and weeds are largely crowded
 out when bluegrass is properly fed.

* * *

* Early issues of the Bulletin com-
 mented unfavorably on the building
 of a layered green, pointing out
 reasons: the chief one being the
 interference with the rise of moist-
 ure from the reservoir of subsoil.
 A layered condition often results
 from the use of sand as a top-dressing.

* * *

* Lime before the time of the
 Green Section was regarded as some-
 thing of a panacea for turf. Experi-
 mental work has demonstrated the
 value of lime in turf culture as
 well as its distinct limitations
 and its ineffectiveness in most
 soils to produce improvements in
 turf growth without the aid of other
 fertilizers.

* * *

* With the advent of the motor age
 and developments in the chemical in-
 dustry the use of manure as a golf
 course fertilizer has declined. The
 Green Section has recognized the
 importance of manure in the growing
 of turf and has continued to recom-
 mend its use in the making of com-
 post, but at the same time has led
 the way in advocating more economi-
 cal and effective commercial fert-
 ilizers to replace manure for general
 turf use.

"I want to express my appreciation of the work that has been done by the
 Green Section. I hardly would want to be Chairman of a Green Committee without
 your Bulletins. Our Professional, who has charge of the course, and our
 Greenkeeper both read them, and swear by them". OHIO

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* Practically the only source of bent grass for putting greens previous to the World War was imported seed of mixed bent. This turf eventually developed patches of many desirable and undesirable grasses. In an effort to obtain more uniform turf selections were made of the most promising of these grasses. Such was the origin of the Metropolitan, Washington and other strains of creeping and velvet bents. The weeding out of unreliable strains was accomplished with the aid of the Green Section. This type of work is by no means completed.

* * *

* The benefit to turf from nitrogen is not fully appreciated until a starved turf is liberally fed. Nitrogen is most effectively used in conjunction with smaller but adequate amounts of the other necessary elements. The value of nitrogen as a fertilizer for farm crops is recognized but in the culture of closely clipped turf nitrogen is even more important in relation to the other fertilizer elements than it is in the growing of other plants.

* * *

* Because black color is associated with high soil fertility there was a tendency in earlier years for peats to be sold to golf clubs at fancy prices. The Green Section took a prominent part in discouraging these abuses. Reports of tests and observations on the proper use of peats for the improvement of the physical conditions of the soil will be found in the Bulletin. The classification and characteristics of peat have also been published.

"You may realize to some degree how far reaching such work as you are doing insofar as golf clubs and other large projects are benefited by it. I do not believe that you realize that thousands of smaller institutions and private individuals are recipients of such knowledge; I mean that in acreage you reach them direct, whereas, in numbers of people you reach a thousand fold more indirectly in your technical work and enlightened principals." ILLINOIS

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* Poa annua is an example of a grass of which the scientific name is used more generally, probably, than is the common name. It has the distinction of being a grass both highly prized and severely condemned on different golf courses. Information is therefore sought on how to preserve it and how to destroy it.

* * *

* Polo, tennis and other sports that use turf have profited from the work of the Green Section. The fundamental principles of suitable grasses, fertilizers, weed and pest control apply in the growing of turf whether it is for golf, polo, football or for lawns or general park purposes.

* * *

* The most important and most carefully groomed turf on the golf course is the putting green. Therefore a major portion of the efforts of the Green Section has been devoted to the problems encountered in building and caring for putting greens. Studies have demonstrated that the most suitable grasses for this purpose in this country are those of the bent group. Long series of experiments have been conducted to determine the most desirable fertilizers for putting green turf. Remedies have been devised for diseases and pests. Information has been obtained to help in the improvement of soil and in other ways aiding the cause of better putting green maintenance.

* * *

* Some species of grass, notably sheep fescue, have been found to be more effective than other species in the rough and may be maintained more economically.

"It is entirely clear that the organization of the Green Section of the United States Golf Association..... is designed to save this country a vast amount of wasted expenditures on golf courses. Let the good work go on."
 NEW JERSEY

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* Ryegrass has been used for many years both as a winter grass in the south and for quick coverage in seed mixtures used in the north. Much information has been given in the Bulletin on the most effective use of this grass as well as advice against the wasteful use of ryegrass seed under the many conditions where the grass is unsuitable.

* * *

* Sand, in addition to its use in traps, has many uses on a golf course. When added in proper proportions it gives a better consistency to heavy soils in putting green construction and for top-dressing. When applied in layers, as has been done so often on greens, it has been found to lead to many maintenance difficulties.

* * *

* One of the fundamentals of good turf is good seed. The Green Section has taken an active part in the exposure of a once common practice among certain unscrupulous seed dealers of disposing of poor and often worthless lots of seed to golf clubs at fancy prices. It has been demonstrated that it is far better to purchase high-grade seed of the desired species of grass than to purchase prepared seed mixtures of unknown composition. Tests have also demonstrated the futility of planting seed at a time when many of the conditions are unfavorable.

* * *

* Many difficulties are encountered in maintaining turf in shade. Some grasses have been found to tolerate partial shade better than others. The influence of shade on root growth has been demonstrated in experimental tests. The Bulletin has also contained much useful information as to the importance of proper fertilizing, watering and drainage of turf in shaded areas.

"I have just finished a preliminary study of the Bulletins you so kindly sent me. . . They are extraordinarily valuable, and several of them will be translated into Russian." U.S.S.R.

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 *Tees, 3:218,232; 5:70; 6:7; 8:174
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 6:60; 9:19; 10:184; 12:43
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* The effect of soil acidity on turf has been studied over a period of years. An acid reaction was found to be advantageous in growing bents and fescue putting green grasses on many soils, but not all. That there are dangers where there is excessive acidity in the soil has been demonstrated by Green Section experimental work, and remedies have been provided.

* * *

* Southern turf problems have always received serious consideration by the Green Section. However, since fewer than one twelfth of the clubs supporting the Green Section activities are in the territory of strictly southern grasses, these problems, of necessity have received less attention than northern problems. Most of the fundamental work on such phases of turf maintenance as fertilization, insect and grub control, wood control, soil improvement and many others apply equally as well to turf culture in the south as in the north.

* * *

* Sulphate of ammonia has been one of the most generally used golf course fertilizers in recent years. Tests have shown it to be an effective and economical nitrogen fertilizer which affords some control of weeds and clover when used properly. The acidifying action has been found to lead to some difficulties which may be overcome by occasional liming.

* * *

* The maintenance of tees calls for special care. Suitable grasses are needed which will not only withstand hard wear but which can recover quickly even at seasons not favorable to rapid growth after the inevitable injury to which it is constantly exposed.

"We are getting a lot of valuable information through the work of and reports from the Green Section and in turn we are experimenting on behalf of the Green Section with fertilizers, grasses, etc., and these experiments could be made also by other clubs scattered through the southern countries with informative results."
 CUBA

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*Vegetative planting, 1:124; 2:292;
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* The principal turf garden of the Green Section has been maintained at Arlington, Va., near Washington, D.C., on ground of the United States Department of Agriculture. These experiments have been conducted under climatic conditions that offer extreme difficulties in the maintenance of northern grasses. Methods that have proven effective at Arlington have invariably proved adaptable under the more favorable turf growing conditions throughout the north. The Green Section has also maintained a turf garden near Chicago and has cooperated with State agricultural experiment stations and with golf clubs throughout the country in conducting a large number of turf gardens in many different regions of the United States.

* * *

* The practice of planting creeping and velvet bents with the vegetative method was devised as an emergency measure due to bent seed shortage which resulted from the World War shipping blockades. Many promising strains were selected and tested. The Washington and Metropolitan strains of creeping bent which are so widely used on golf courses were Green Section products.

* * *

* Artificial watering of turf has made our modern golf course possible. Unfortunately water may also be a detriment to grass. The Green Section has contributed much information on how to use and how not to use water on turf.

* * *

* Weed control has always received the careful attention of the Green Section. Many methods for reducing or eliminating weeds have been presented from time to time in the pages of the Bulletin.

"Personally, I cannot tell you how much we all appreciate the amount of effort put in by your department, and with this in mind, we are going to try to cooperate even closer this coming season in an effort to raise more funds which will permit both your department and our District to continue the experiments and research work." MISSOURI