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.

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* 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.

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* 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

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"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

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.

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* Bermuda grass is the most important turf grass of the South. The Green Section has obtained and distributed much valuable information concerning the maintenance of this important grass as well as the temporary grasses that supplement Bermuda grass turf for winter play.

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* 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.

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* 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 generally 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.

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*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

control of brownpatch, 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.

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* 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 without 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.

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* Clover is one of the most persistent weeds in golf turf. The experimental work of the Green Section has brought out clearly the importance of a liberal use of readily available nitrogenous fertilizers in the control of clover. Experimental work now in progress promises to give clubs much more effective measures for checking this plant.

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* Many of the difficulties experienced 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

* Crabgrass is another of the common weeds of golf turf. The control of this pest involves quite different 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.

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* Cutworms and other worms that feed on grass destroy putting surfaces. 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.

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

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* A large assortment of fertilizers have come into general use on golf courses since the days of manure mulches. The most effective and economical use of fertilizers 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

* 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.

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* 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.

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* 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

* Kentucky bluegrass is the mainstay 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.

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

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* Lime before the time of the Green Section was regarded as something of a panacea for turf. Experimental 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.

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* With the advent of the motor age and developments in the chemical industry 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 recommend its use in the making of compost, but at the same time has led the way in advocating more economical and effective commercial fertilizers 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

* 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 undesirably 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.

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* 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.

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* 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

* 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.

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* 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 other sports or for lawns or general park purposes.

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* 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.

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* Some species of grass, notably sheeps 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

* 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.

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* 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.

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* 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.

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* 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.

* 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.

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* 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, weed control, soil improvement and many others apply equally as well to turf culture in the south as in the north.

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* 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.

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* 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 those experiments could be made also by other clubs scattered through the southern countries with informative results." CUBA

* 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. There 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.

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* 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.

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* 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.

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* 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