

There was some concern on this editor's part to include the three following articles with this "Heritage" issue of the GRASSROOTS. They were all written by John S. Bone, formerly of Blackhawk Country Club in Madison. My hesitation was caused by my concern that too much material about my own golf course might be misinterpreted by some as selfishness. However, since the "call" for historical materials relating to the WGCSA went out six months ago, limited items have come my way. So, since these articles do give an insight to the golf course management business in Wisconsin fifty to sixty years ago, I am including them. As one of my trusted colleagues and advisors pointed out, there is no good reason to withhold this historical information simply because the author and I have worked at the same Club.

John S. Bone was important to the WGCSA. He was one of the founders of our Association and was present at the UW "Greenkeeper" short course that precipitated our incorporation. He was a four term president of the WGCSA and was an Association leader for many years. There are a few older members at our Club who still speak highly of John.

The first article was printed in the September 1927 issue of GOLFDOM. The second article appeared in the March 1929 issue of the same journal. Both articles were sent to me by Janet Seagle, Librarian and Museum Curator for the United States Golf Association in Far Hills, N.J.

The last and shortest article appeared in a 1939 issue of THE DIVOT, the newsletter of Blackhawk Country Club, and is courtesy of Mrs. Jo Radder, editor of the newsletter. John obviously felt communication with the members of his Club was extremely important — some things never change. Several of the points he makes in his message to the membership indicate that principles of turf culture don't change much over the years either. He made points about height of cut, irrigation practices on Kentucky bluegrass and localized weather conditions that are just as appropriate today as they were in 1939.

Monroe S. Miller

Black Hawk's Green Making and Maintenance Methods

By F. B. Hadley, Green Chairman, and J. S. Bone, Greenkeeper, Black Hawk Country Club, Madison, Wisconsin

ALL persons who are charged with the responsibility of building and maintaining putting greens are constantly on the lookout for helpful suggestions. The writers have secured much help along this line from contributions in GOLFDOM. While we do not maintain that our practices are the best, we know that the results secured have been gratifying. Consequently at the suggestion of the editor, we are giving below a rather hurriedly composed outline of our methods.

Before starting work of any kind it is absolutely essential to have a labor force that can be relied upon. The more experienced a man is in golf course maintenance work, providing he uses his head, the more valuable he is to the greenkeeper. Without an adequate, well organized force, even the best greenkeeper is incapable of securing the desired results. Competent help is scarce, consequently the greenkeeper endeavors to help a good man when he finds him.

Here is a summary of the methods of an ideal team. The green chairman is a practical scientist and the greenkeeper a man with genius for turf culture methods. This association is one rare in golf, but of a type to bring joy to the hearts of the club members.

Note the emphasis they put on the element of labor. No matter how good the technique is, unless the staff is right, the results are disappointing.

The procedure we follow in this work is given below, step by step in logical order of sequence and inches (1) grading, (2) surfacing, (3) planting, (4) mowing, (5) top-dressing, (6) water, and (7) weeding.

Grading

A sketch should be made for use as a guide, keeping in mind the desirability of altering the topography as little as possible. Nothing is more hideous, in our

opinion, than elevated greens with steeply sloping sides. They utterly spoil the appearance of the terrain and constitute an unnatural hazard that is not needed. Constructed elevations should be blended into the surroundings by making very gradual slopes, so as to deface nature to the least degree necessary. Grading includes a careful study of the surroundings to insure necessary surface drainage. It is desirable to allow several weeks to elapse after the grading is finished to permit the ground to settle.

Surfacing

This should take into consideration the soil

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composition and texture. A heavy clay or other impervious soil must be covered with a soil containing humus. The addition of a considerable quantity of sand and the incorporation of a fertilizer containing available nitrogen for plant growth to the surface of the green is imperative. The top-soil is put in final shape by hand raking and when finished should be very fine, relatively loose, free of all lumps, roots, etc.

Planting

The bent grass sod is cut into rather small pieces by running it through an ordinary farm root cutter. If any clover or other undesirable plants are present in the sod, these should be sorted out. The stolons should be distributed as evenly as possible and in sufficient quantity to cover the ground well, thus avoiding gaps which are so liable to form tufts later. To keep the roots from drying out, they must be distributed over a small area at a time and covered as soon as possible. Enough top-dressing is applied just to cover the stolons and the surface is rolled at once and sprinkled. Sprinkling should be done by hand, rather than with a sprinkler attachment, to avoid washing the fine top-dressing mixture into ridges. This statement also applies to established greens during the first two or three days after top-dressing.

Mowing

The lawnmowers are put into use as soon as the grass has reached a height of about two inches. The grass is mowed every day thereafter. Sundays excepted, throughout the season. Preferably the mower should be run one day at an angle to the direction it was run the previous day, keeping in mind the advisability of cutting in rotation in four directions. This tends to keep the grass growing upright and to make the surface uniformly even. The mowers must be kept sharp to avoid tufting the grass—the bane of the golfer.

Top-Dressing

This is done as required to maintain the growth and condition of the grass and is as important as daily mowing. Among the reasons for top-dressing may be mentioned the following: (a) to protect the new stolons that grow laterally from near the base of the parent plant; (b) to furnish nourishment; (c) to fill any unevenness in the surface of the green. The top-dressing mixture which we are using has given splendid results in the past. It is composed of two parts compost, one part sand, with which is mixed for general use one and one-half pounds ammonia sulphate per 1,000 square feet of green. The ammonia sulphate content is varied to suit conditions. It is increased for spring and fall use and reduced for use in the summer and on newly planted greens.

Watering

Water makes available the plant foods in the soil by putting them in solution. The quantity of water needed will depend upon the season of the year, the nature of the soil, and the rainfall. We believe the matter of judicious watering is one of the most essential steps in establishing and maintaining a perfect bent grass green. It requires constant supervision and good judgment to obtain the best results from watering. The surface of a newly planted green should be kept moist at all times. This is accomplished by sprinkling daily until the ground is thoroughly saturated, but never to the extent that streams are formed, as they uncover the stolons and also leave the sur-

face of the green rough. For all sprinkling we believe a nozzle should be used that throws a fine spray, as the surface of a green becomes disfigured by too heavy a stream of water, which beats holes in the top-dressing and is likely to make little ditches.

We have solved the watering problem by employing a night man. He starts work at 7:00 p. m. and finishes at 4 a. m. His last duty is to turn on the sprinklers used to water the tees. These are allowed to run until the day force commences work in the morning. The statement that water and more water—though not in excess—is the only hope of keeping the grass green and growing is particularly pertinent to this discussion. Next season we plan to water the approaches to the greens.

Weeding

While it is possible to control weeds to some extent by applying an acid-reacting top-dressing, every putting green requires hand-weeding at least once a season. Messrs. Oakley and Fitts, in the *Green Section Bulletin* for July, 1927, state that the chief weed to fight in the latitude of Washington, D. C., is crab grass. This is also true in Wisconsin. The time to eradicate crab grass is when it first becomes more evident. One man can then remove more crab grass plants than can three men after the plants have started to branch. Crab grass is the greenkeeper's worst enemy and does more damage to greens than all other weeds combined.

Sand Must Contain No Lime

The sand which we have been using in our top-dressing mixture has recently been analyzed and found to contain nearly 18 per cent carbonates. This surprised and disconcerted us, as we were working under the impression that our sand carried little or no lime. It is a well established fact that lime is contra-indicated on the golf course, as it facilitates the growth of clover and weeds, both of which the greenkeeper is continually fighting. On the other hand, an acid-reacting top-dressing mixture inhibits the growth of these plants, yet stimulates the growth of bent grasses. A supply of quartz sand containing practically

no carbonates has now been secured, so we anticipate better results in the future.

Acid-Reacting Top-Soil Important

The black top-soil used for composting purposes is also subjected to chemical tests to determine its inorganic and organic matter composition. By this method we have been able to secure a soil high in organic matter (humus) yet carrying no carbonates (lime). With this information to guide us and a contract for a load of horse manure every day of the year for composting, we feel that the putting and fairway greens at the Black Hawk Country club should soon be as good as any in the country, as nature has provided a wonderfully fertile, well drained soil which only needs intelligent management to produce an ideal stand of the desirable grasses.

So far we have been fortunate in experiencing no damage from brown patch or other fungus diseases. Earthworms are a pest at times, but an application of corrosive sublimate (mercuric bichloride) in solution has been an effective means of controlling them.

Planting Greens in Spring

We are convinced that the best time of the year to start work is in the late summer and early fall, the idea, of course, being to secure a good stand of bent before winter sets in. However, as every green chairman and greenkeeper knows, it is usually impossible to accomplish before snow flies all the work planned, so some of it must of necessity be postponed until spring. In southern Wisconsin excellent results have been secured with bent grass stolons planted in the spring. We tried this method on one green last season and another one this season. The 1926 work resulted in a green that was suitable for use just sixty days after the stolons were planted. This green now probably has the best putting surface and the most ideal stand of fine bent grass in this section. The green that was planted this spring was ready for play in practically the same length of time.

One of the big problems in connection with spring planted greens is fighting the weeds of all kinds which grow so rapidly under the ideal conditions for plant growth which must be maintained for the grass. This necessitates several hand weeding, but final results amply justify the expense.

MAINTENANCE POLICIES that make GOOD at Blackhawk

BY JOHN S. BONE

Blackhawk Country Club, Madison, Wis.

AS every greenkeeper has learned, it is impossible to follow entirely any hard and fast rules, for I can think of no business that is so governed by weather conditions as is ours. Each morning, we might say, presents its particular problems of adjusting plans to conditions.

To go into every detail of Blackhawk's methods of maintenance would not prove profitable, as we follow in a general way the accepted methods of present day practice.

Labor management we all recognize at once as one essential that if properly handled will go a long way in the solution of many of our other problems. We recognize that the quality and quantity of available workmen varies somewhat in different sections, and we find ourselves particularly fortunate at Blackhawk Country Club in being able to secure exceptionally good, reliable men, most of whom have been with us four, five, and six years. Each man has his own work for which he is trained and held responsible. In order to stay on our force a man must do

his work as directed, in a workmanly fashion, in a reasonable length of time, and show an interest in his work.

Report System Employed

Each man understands that he is expected to report to me anything that he may see on the course that is out of order or calls for my special attention. All our men are hired by the hour and receive pay for overtime whenever it is necessary to call on them for special work. Our rule is to treat our workmen as we would wish to be treated if we were in their places, and we have the respect and friendship of the entire force. One faultfinder can spoil a whole crew and the sooner we get rid of him the better.

Assaying Purchasing

Every greenkeeper should keep himself informed as to labor-saving machinery. The test of whether a club should purchase such machinery