

7. *Weeds.* As in I.
8. *Top-dressings.* As in I.
9. *Fertilizers.* Use bone-meal.
10. *Liming.* Lime may be used, perhaps, to advantage.
11. *Earthworms.* As in I.
12. *Grubs.* As in I.
13. *Spiking.* As in I.
14. *Hole placement.* As in I.
15. *Brown-patch.* Both bluegrass and white clover are immune to brown-patch.

III. BERMUDA PUTTING GREENS IN THE SOUTH.

1. *Soil.* A rich clay loam, at least three inches deep if on top of sand soil. Really good Bermuda turf can not be produced on sandy soil.
2. *Drainage.* As in I.
3. *Grass.* Plant by the vegetative method or "sprigging." Different strains of Bermuda are of very unlike quality. The Atlanta strain is the best known. See THE BULLETIN, Volume II, pages 97 and 151.
4. *Mowing.* As in I. See also THE BULLETIN, Volume II, page 151.
5. *Rolling.* As in I.
6. *Watering.* Use sparingly and only when really necessary. See THE BULLETIN, Volume II, page 151.
7. *Weeds.* Keep the greens always well weeded. Two or three southern weeds are very dangerous on Bermuda greens.
8. *Top-dressings.* Top-dress as often as the surface runners make necessary. Cutting off the runners will reduce the amount of top-dressing. Use a rich loam, preferably clay loam.
9. *Fertilizers.* Use moderately. A rank growth of Bermuda grass encourages runners.
10. *Liming.* Lime appears to be beneficial to Bermuda greens.
11. *Earthworms.* As in I.
12. *Grubs.* As in I.
13. *Spiking.* Regarded by some as beneficial. See THE BULLETIN, Volume II, page 151.
14. *Hole placement.* As in I.
15. *Brown-patch.* Does not attack Bermuda greens.

Treatment for Unwatered Greens

DR. MAYNARD M. METCALF, THE ORCHARD LABORATORY, OBERLIN, OHIO

Before the Country Club at Leland, Michigan, had water on its putting greens, it was troubled in dry weather by their becoming thin and full of small irregularities between the grass tufts, making a very unsatisfactory surface for putting. Several considerations made it necessary to postpone putting water on the course, but meantime temporary measures were taken to improve the surface, and with fair success.

The natural soil of the green was very sandy, with small gravel stones which had to be removed as the frost brought them up, and this process increased the irregularity of the surface.

We adopted the plan of sprinkling sandy loam, a fairly rich soil, over

the surface of the greens and rubbing it in with the back of an iron garden rake and then rolling with a moderately heavy roller. In order to prevent the roller from straddling any of the slight hollows and so doing its work unsatisfactorily, we rolled always both north and south and east and west, and then we rolled diagonally northeast and southwest, and northwest and southeast, rolling thus in four directions. In this way the roller pressed every bit of the surface. The surface soil washed rather badly, so that after every hard rain the process had to be repeated, but it was not a great labor and took but little over an hour to an ordinary sized green.

The advantages of this treatment were several. We got a green that was playable with a good degree of accuracy. The rolling did the sandy soil good. The loam added to the green was in itself a benefit. In using this treatment upon a clay soil only a light roller should be used, and on such soil the top-dressing used might well be more largely sand. Adding grass seed to the loam before spreading may be of some use, but under the conditions in Leland it was hardly worth while, for the trouble with our greens came when they were too dry, and surface seeding in dry weather, even with the use of the loam, would be a mere waste of seed.

Bird Grass (*Poa trivialis*)

C. V. PIPER AND R. A. OAKLEY

This grass is also called Rough-Stalked Meadow grass and Rough-Stalked bluegrass. It is a native of Europe and valued there both as a pasture and meadow grass under numerous different names. Indeed, one writer called it the "queen of the pasture grasses." It was long since introduced into the United States but has never attained any prominence as an agricultural grass in this country.

The illustration shows its characteristics well. The leaves are of a pale apple-green color, much paler than most other turf grasses. Each separate plant in a lawn makes a circular mat one to two feet in diameter, at the edges of which the tips of the spreading stolons are usually evident. It is by these stolons that the grass spreads, and usually these are wholly on the surface like creeping bent, but some may be partially underground.

Bird grass is the best of all shade grasses in the northern half of the United States. It is superior even to red fescue. The pure turf makes an exquisite carpet. The grass is not uncommon on putting greens and in fairways, especially in the moister soils. The turf is of excellent quality even for putting. Unfortunately it is very subject to brown-patch, and it also is seriously set back by the heat of midsummer. The grass occurs as far south as Louisiana, but southward is found only in shady places.

Bird grass is valuable on golf courses, either for fairways or putting greens in New England and in the northernmost tier of states, but for putting greens it is not so good as the bents. In these states and also southward as far as the Potomac and Ohio rivers it is the best of all grasses for shady places.

The seed is harvested mostly in Denmark and is usually available in fair quantities. The vegetative method of propagation can, however, be readily used with this grass.