

time of the girls, and they are given a holiday when the weather is too hot or the grass is too wet or play is too heavy.

## Putting Greens on Heavy Clay Soil

By Lewis M. Evans

The Cedarbrook Country Club, in common with the other golf courses near Philadelphia on the Pennsylvania side of the Delaware River, has a heavy clay soil. When the course was built, about eight years ago, little thought was given to underground drainage of the greens or to the lightening of this heavy clay. The greens were seeded with a mixture of bluegrass, redtop, fescue, and some velvet bent, and the fairways with one of the popular fairway seed mixtures. About four years ago, with a view to changing the greens to pure bent grass, we began to plug the greens with creeping bent turf and to seed with bent seed. Today the greens average about 70 per cent bent, the balance being Kentucky bluegrass, redtop, fescue, and annual bluegrass (*Poa annua*). The seeding is done between August 20 and September 15. The plugging is done in the fall, the patches of clover being cut out and replaced with good bent sod. The plugs are sealed with compost, and when spring comes their union with the adjoining bent is complete.

In size the greens average about 5,000 square feet. They are poled and cut every day except Sunday. For cutting the greens we use a hand mower with grass catcher attached. This work begins at 7 o'clock in the morning.

In preparing the compost for this heavy clay soil we use five wheelbarrows of well-rotted manure to a ton truck of soil, the manure and soil being arranged in layers. In the fall, when we cut the compost pile down and turn it, a light sprinkling of sulphate of ammonia is given. The pile is shaped with a shoulder about one foot high around the edge for the purpose of retaining the rain that falls on it as well as the snow water. In the spring we again cut the pile down and turn it, and at this time add the sand. During the first six weeks of spring we endeavor to give the greens at least three applications of compost, as it requires this treatment to true up the surface after the battering received from the late fall and winter play, the course being open to play all year. The only other fertilization given the greens is a light application of sulphate of ammonia weekly during the cooler weather, at the rate of about four pounds to a green, which is sprayed on at night. We have also used poultry manure compost on the greens with great success, and this fall we intend to use nothing but this mixture, of which we recently prepared a 100-load pile, mixed four to one, which we have under cover drying out.

The watering and spraying of the greens with sulphate of ammonia or with fungicides for the control of brown-patch, is done by two night men working from 7 o'clock in the evening to 7 o'clock in the morning. In watering they average 15 greens, and about 12 in spraying.

In weeding the greens we find it best to take all the men for about one hour occasionally, going from green to green, and in this way we manage to keep the weeds under control. The greens have received three applications of arsenate of lead, totaling about 45 pounds to a green, and they are now nearly free of worm-casts as well as grub-casts.

As the play on our course is heavy, we find it necessary to move the cups at least four times a week, and daily for a few days after applying compost, as the areas around the cups look bad on account of footprints.

In our bent nursery, which is 2,500 square feet in area, we grow a selected strain of creeping bent, which furnishes us a supply of turf for repairing damage to greens and replacing patches of clover when removed.

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## Seeded Greens at the Allegheny Country Club

By John Pressler

Here at Sewickley, Pa., we are playing on putting greens planted with seed 28 years ago. Our experience has been that by fertilizing them liberally little trouble will result from brown-patch. Once a week during April and May they are given an application of sulphate of ammonia at the rate of 6 pounds to a green. Each green is also given an application of 50 pounds of a commercial fertilizer at the end of May, and again in August. A top-dressing of leaf mold obtained from nearby woods is given once a year to such greens or parts of greens as begin to show wear or damage from other causes. Reseeding is resorted to only when necessary to repair damage from winter-kill or brown-patch. We do not use temporary greens.

Our soil is shale and clay, and about every four years we give each green an application of 1½ yards of sand. The greens are rolled three times a week with a 150-pound roller. Only three of the greens have tile drainage, the natural drainage being all that is necessary for the remaining 15 greens. They are watered one-half hour each morning, using one-inch hose. They are mowed each day, and the clippings are not removed. The greens are brushed only after being mowed. Each man waters, cuts, rolls, and weeds his own greens, three greens being assigned to a man. With leaf mold readily available, we have never resorted to the use of compost for top-dressing.

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## Creeping Bent Greens at Hot Springs, Virginia

By Fay Ingalls

On the 10th of September, 1923, we started to construct the Cascades Golf Course out of virgin wilderness. The first greens on the course were planted with the Ekwanok strain of creeping bent in the early summer of 1924. We planted 19 of these greens and played on them in October of that year. In 1926 we remodeled another course, on which we built 15 new greens, planting these with Metropolitan bent. Possibly from wisdom gained from our experience, the history of the Metropolitan greens has been uninteresting, but the Ekwanok greens suffered from all the ills that a putting green is heir to. To begin with, drainage was neglected in their construction; stolons were treated erroneously in the first year of their growth; insufficient top-dressing was applied; weeds and clover at one time threatened to wipe them out; they were burned at one time or another by every chemical applied to them; they developed a long nap; and they suffered from winter injury.

These two courses are located at an average elevation of 2,500