

Fertilizing Putting Greens at Wilshire

By Robert S. Greenfield
Wilshire Country Club, Los Angeles

Our putting greens, which with a few exceptions are 11 years old, were originally a mixture of fescue, Kentucky bluegrass, and rough-stalked bluegrass (*Poa trivialis*). Four years ago seaside bent was seeded upon the original turf, with the result that now the greens are practically pure bent, except that during the cooler months of the year some plants of the rough-stalked bluegrass are still evident.

Our soil is a black adobe clay 2 to 3 feet deep underlaid by a sub-soil of a mixture of gravel and compact brown clay. Several of the greens were under-drained with tile and crushed rock. This drainage however proved of little value, as the tile was laid too deep and the rock fill was not brought up high enough, thus apparently being inaccessible to the storm water. We believe in good surface drainage for a soil like ours. In building the greens, top soil was not available, and as a rather poor substitute sandy silt from our barranco was used.

We depend mainly on compost top-dressings for fertilizing our greens. We apply 1½ yards to 4,000 square feet. As our greens are large, half a green can be top-dressed at a time, thus allowing a sufficient portion to remain without dressing for the use of the players. The material is applied by hand. We have not found a mechanical spreader that does as good a job as a well-swung shovel. We do find however that a small-sized mechanical spreader is fairly satisfactory for applying concentrated fertilizers.

Although at various times we have used various commercial mixed fertilizers, we prefer those that are not mixed, such as 13 per cent blood meal, cottonseed meal, or fish meal. For the past two years, in addition to compost, we have used an organic mixture consisting of 13 per cent blood meal, cottonseed meal, and sardine meal, with a filler of converted sewage, the complete analysis being 6½-2-0. We apply this at a rate of about 100 pounds to 4,000 square feet. We are so well pleased with this mixture that we have it made up to our order by a local dealer.

We have no fixed feeding program, except that in the early fall we always apply a compost top-dressing to all our greens and aprons. We feel that the less stimulation given turf at that time, the better. Heavy winter play nevertheless calls for some fertilization; so we compromise with a mild compost, which carries us through the winter in fair shape.

Our greens generally respond to the spring rains without much assistance from us, and show vigor and good color. They are ready for fertilization about May, when we give them a compost top-dressing and an application of the organic mixture to which I have referred.

This is about as near as we get to a fertilization schedule. During the summer there are always some greens needing something extra, which is generally a light dressing of compost. Attacks of brown-patch at times call for a stimulant to assist in the quick recovery of the turf. We use sulphate of ammonia only after the greens have been injured by a severe attack, applying it dry. Usually we check the attack by the use of a commercial mixture of calomel and corrosive sublimate before any real damage is occasioned.

In deciding when our greens need fertilization we depend on signs

of slow recovery from heavy play, signs such as lingering ball gouges or heel scars. We try to avoid feedings that cause a lush growth and heavy clippings. Our heaviest clippings occur during times of spring rain. We have no trouble as regards color during the growing season, but the turf does go off color a little when the cool weather comes.

In January we shall be the host for a big tournament, and in the hope that we may have greens of a good color by that time, we shall add our 6½-2-0 organic fertilizer mixture, as a further stimulant, to the compost top-dressing which we should apply early in November. It may be somewhat wasteful to apply such fertilizers in the hope of keeping good color through the cold weather; but should the weather warm up again it is likely that a better reaction will be obtained than if the compost alone had been used.



The eighteenth putting green of Wilshire Country Club, Los Angeles, Calif.

After a long summer of irrigation we find it necessary to top-dress with sand. We use a sharp silica sand free from lime. The constant threat of invasion from native clover makes it necessary that the use of lime be avoided. We also use a light dressing of charcoal in the late fall; this seems to prevent a nasty state of sweating during dull, muggy days, and also makes the turf firmer.

We have kept a record of all fertilizers applied since the course was built. The record shows that compost has been the main diet, blood meal and cottonseed meal next, and mixed fertilizers last. Our mixed fertilizers have always been low in phosphoric acid, never more than 2 per cent, and very low in potash and lime, simply such as occurs in the cow and horse manure in our compost.

In making our compost we use as light a sandy soil as we can buy. In years past we also used cow and horse manure; but such manures are becoming scarce and expensive in the vicinity of Los Angeles, so that we are now using a good grade of steer manure, which runs about 2 per cent nitrogen. We also use a coarse wash sand from the rock crushers. We have no exact proportions of soil, sand, and manure to use in our compost. We first put down a layer of soil of about 6 inches, then about 1 foot of manure, and then 2 or 3 inches of wash sand. We repeat the operation until the pile is 6 or 7 feet high. We

then cover the sides and top with a 6-inch layer of soil. We leave the pile undisturbed for a year. The pile is built on a concrete floor and covered with a permanent roof. We keep it moist with overhead sprinkler pipes. The second year we turn the pile twice, and the third year it is ripe and ready for use.

Readers will perceive at once that we do not favor any popular short cuts in greenkeeping nor place any dependence on magic brands of fertilizers. Considering the poor character of our soil and the results we have obtained, we believe the course we are pursuing in the use of fertilizers for our putting greens is a logical one. We can not close without giving expression to our appreciation of the unbiased service the Green Section has been to us in connection with our problems and the confidence with which we look forward to its further aid.

Experience With Fertilizers at Plainfield Country Club

By F. J. Roth

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The past ten years have witnessed many changes in fertilizing putting greens, and a brief narrative of our own experiences during the period will doubtless reflect the experiences of many other golf clubs. The narrative is of peculiar interest to me, inasmuch as I built the course in 1920 and have accordingly had opportunity to witness the results of different practices under conditions with which I am thoroughly familiar. In the end I feel that we have made some progress, since the results seem to satisfy our club members at an annual expenditure of \$25,500 for our 27-hole course.

Our greens are built on a gravelly clay subsoil. Some are slightly built up and others are on natural contours. We have on an average 6 inches of compost for the top layer. Four of the greens are provided with subdrainage. They were seeded in 1920 with a mixture of 40 per cent German mixed bent, 50 per cent New Zealand red fescue, and 10 per cent redtop. At the present time practically all of the fescue has disappeared except on our No. 1 green, which seems to hold the fescue very well. No reason is apparent for this, as the green was constructed in the same manner as the other greens. It is strange also that with this green we never have any trouble; it requires the least amount of fertilizer to keep it in condition. Annual bluegrass appears in all of our greens in the spring, persisting until the middle of June, when it weakens and is replaced with bent to the extent of 40 to 75 per cent.

In 1921 and 1922 we top-dressed with compost alone, using one yard to a green. In 1923 we began using sulphate of ammonia for the effect it would have in reducing the amount of clover in the turf. In 1924 we discontinued the use of compost, since we found that our compost contained much plantain seed. From that time on we have used nothing but mushroom soil as top-dressing material or as a medium for the distribution of fertilizers, fungicides, or insecticides. During 1925 we top-dressed each green monthly from April until October with $\frac{1}{2}$ yard of mushroom soil into which 10 pounds of sulphate of ammonia had been mixed. In 1926 and 1927 we cut down the amount of sulphate of ammonia used, making two applications of 20 pounds each, one in April and one in October, and during the intervening period of the season used nothing but mushroom soil at the