

PLANTING

Seeding.—It is poor practice to seed in the spring under almost any condition. Seedlings do not develop quickly enough to crowd out the weeds, which are most active in the spring. Even in cases where the seed bed has been prepared in the fall ready for seeding at the earliest opportunity in the spring, it is rarely that the fairways are fit to play on until the following spring. Sometimes hot, dry summers kill a large percentage of the tender seedlings, as the seedlings have not had sufficient time to develop a root system before the advent of hot weather. In any event they are more or less easily affected by dry spells and usually make little growth the first summer. By seeding in the late summer or early fall the seedlings become established before winter; also in the preparation of the seed bed most of the weeds are destroyed. In the early spring the young grass develops an adequate root system and makes use of the ideal growing weather, and has a good chance of smothering out any weeds left over from the preceding year. By the first of June after early fall seeding, courses are often opened and provided with excellent fairways.

The reason for comparatively heavy seedings on golf courses is that a dense turf is required. Apart from the fact that the more seed used up to a certain point will give a thicker catch, is the fact that by using more seed a better distribution of the seed is usually accomplished. The more carefully the seed is distributed the less will be required to produce good turf. Also the finer the soil in the seed bed is prepared the greater will be the percentage of seed that under otherwise similar conditions, will germinate. On fairways of a clay or silt nature it may be necessary to break down the lumpy surface by frequent applications of the smoothing harrow with a light rolling in between. Also on fairways a plank drag will rub and crumble lumps without the danger of compacting the surface by too heavy rolling. The seed bed should be prepared when the soil is in a comparatively dry condition. Skilled workmen can distribute seed evenly by hand sowing. When hand sowing of fairways is done it is economical and good practice to distribute the bags of seed required for one fairway around or through the fairway so that there will be an additional check on whether or not the seed is being applied at the calculated rate. A gang of five men who actually sow the seed is found to be efficient. It is not easy to sow in a heavy wind, but a faint breeze is sometimes helpful. First it should be found from practice about how wide a space each man can evenly broadcast the seed over while walking. The five men should then commence at one side from five poles placed at the correct intervals; they then head for five poles or markers on the opposite side of the piece to be sown. This keeps the sowers in a straight course as they walk. After they leave the markers at one side of the field, a man placed there for the purpose moves the markers into the positions to which the sowers should walk on their return trip. Their seed pails should be refilled at each or either side of the area being seeded so as to remove the possibility of skipping some of the ground to be seeded. There are several fine mechanical seeders on the market, and when seeders are used probably only two or three would be operated. In either hand sowing or mechanical seeding it is desirable to sow half of the required seed when seeding across the fairway and the other half when seeding lengthwise. When seeding lengthwise with the fairway the fairway should be divided

into sections so that the sowers are not required to walk towards a point so far distant that they can not keep their course.

After the seed has been sown it should be mixed with the top half-inch of soil, and not deeper. This may be done on heavier soils by a smoothing harrow, provided the spikes are set at an angle, so that they will not dig too deep. On lighter soils which have been prepared so that they have a very fine mulch, a brush harrow is often used to distribute the seed through the surface soil. Brush harrows are made by laying bundles of fine switches between planks. A clevis is balanced in the center so that the team will pull the harrow evenly. When dragging to mix the seed in the surface soil, it is usually best to use a team of horses. The drag will partially eradicate their hoof prints. If tractors are used the wheels are liable to pack the soil so tight that sufficient mulch is not left in which to mix the seed. The horses should have their hoofs wrapped in bagging to prevent deep imprints.

After the seed has been harrowed or brushed into the surface mulch, a light roller should be passed over the seeded area.

Backs and sides of greens and tees should be seeded with the fairway mixture. Bunkers also are usually seeded with this mixture, although some clubs prefer to use the seed for the rough on mounds in order to give the earthwork a rugged, natural appearance. On mounds it is usually necessary to apply some topsoil as a germinating layer before seeding. After seeding, the mound should be tamped with the backs of shovels, if the grade is too steep for a roller, so that the seed will be less liable to be washed or blown away.

As the rough should be seeded with a different mixture from that used on the fairways, it will be seeded separately.

After seeding in the early fall it will be quite likely that the grass will need to be mowed once at least before it becomes dormant during the winter. The mower used should be sharp enough not to pull the grass seedlings while cutting. As soon as the ground becomes dry enough in the spring the seeded areas should be rolled. On stony fairways no doubt many stones will appear at the surface the following spring, due to frost heaving, and these should be hand-picked or raked off before spring rolling and mowing commence. The rolling should be done after the ground has commenced to dry out, and the roller should be heavy enough only to press the turf firmly down to the soil. After mowing is once begun the grass should never be allowed to become long or coarse. An application of fertilizer in the spring or fall is of more value on either a young or an old fairway than is an application of seed.

When areas of fairway need special attention on account of bare spots caused by washouts or pockets of poor soil, it is usually money wasted to reseed without special preparation being given to these areas. Manure or other organic matter should first be incorporated in the surface soil or a top-dressing of good soil should be applied.

Vegetative Planting.—When planting creeping bent or velvet bent by the vegetative method, one square foot of turf from the nursery row will provide sufficient stolons to plant 10 square feet. The stolons should be shredded and chopped or cut into pieces of from 2 to 3 inches in length. The putting green surface should be prepared as for seeding and the stolons distributed evenly. About one-third inch of sifted compost is then spread on the stolons by means of hand

sifters. With this amount of sifted compost the stolons will not be completely covered and many of the stolons will protrude above the surface. It is not wise to bury the stolons deeper. A light roller should then be passed over the planted area. The stolons must be kept damp by frequent watering, using a fine spray.

After the stolons have sent up blades to a height of $1\frac{1}{2}$ to 2 inches they should be mowed down as close as possible with a sharp mower. The clippings from the first cutting should be left on the green, and another top-dressing similar to the one used while planting should be applied. From that time on the new green should be mowed regularly with the blades set at putting green length. The first clippings were left on the green, since where there is a node in any clipping a new shoot is likely to develop; but after the first few mowings of the green the clippings should be removed.



Spreading sifted earth over stolons in the vegetative planting of creeping bent. The superintendent stands nearby to see that the stolons are covered to the proper depth.

When fairways are planted by the vegetative method, the top-dressing is usually applied to the stolons with a mechanical soil spreader. However, good results have also been obtained by lightly pressing the stolons into the turf with a disk harrow set so that it will not turn the soil over. In both methods of planting, the rolling, watering, and mowing should follow as with plantings on greens and tees.

SODDING

If the grades on the course are sufficiently easy, seeding may be done on backs of greens, slopes into traps, or grades from tees, but if the grades are steep it will be found that sodding is the quicker method of getting a turf. Also areas frequently wash out, and as it is sometimes very difficult to get a catch of grass from seed on such places, sodding is resorted to. Where dead turf or weedy patches are removed on greens or tees sodding is frequently found to be the quickest manner in which to replace the turf. For this reason it is