

grass and makes satisfactory play impossible.

Grade to remove excess surface water quickly, using wide shallow channels to carry water off in several directions. Avoid carrying surplus water to the approach.

The second is sub-drainage. Water that enters the soil must either be used by the grass or it must escape by underground drainage. This means that the subsoil must be porous or that tile must be laid to carry excess soil water away.

The third is internal drainage. In order for water to percolate through the soil where roots can have both air and water, it is necessary to have large pores in the soil. This is a function of the physical condition of the soil which must be granular and porous or it may be opened mechanically from time to time to let water enter and percolate through.

The fourth is air drainage. Greens that are built in a pocket surrounded by dense brush or trees will have difficulty. Free movement of air across a turfgrass area will help to reduce disease attacks and will facilitate maintenance.

Q—Should we install tile drains in our greens? Our subsoil is quite sandy. (Fla.)

A—Save your money. A sandy porous subsoil is ideal for the base of a green. If your subsoil were impervious clay you would do well to install tile drains.

Q—Is it all right to spread wood chips on our new fairways? In our clearing operations we use a wood chipper to grind everything that has no value as fire wood or lumber. Some say that the wood chips will make the soil so sour we can't grow grass. (Va.)

A—Spread the chips and disc them in with plenty of lime and complete fertilizer. They will help to condition the soil and you will have better grass as a result.

The "souring of soils" refers to the sickly yellow stunted appearance of grass that tries to grow on soils that have not sufficient nitrogen to balance the excess of carbohydrates in the wood. One of the good materials to use in soil preparation in your case is cyanamid which supplies nitrogen and lime and destroys weed seeds at the same time. It hastens the decomposition of the woody material.

Q—Where can we get a list of equipment that we can purchase on construction funds so that we are able to operate

properly before the course is opened for play? (Ks.)

A—Such a list has been available from Golfdom and we understand that a revision is in the making. We consider it wise to completely outfit the course with good standard equipment on construction funds. In later years it is much easier to keep up-to-date by simple replacement.

Q—We are planning construction of a fee course. We want to have good quality greens, but we also feel that we should use a grass that can take a lot of wear. Would Tiflawn bermuda be a good grass to use? (Ala.)

A—If greens are properly maintained, Tiflawn will make an excellent, wear-resistant putting surface. It is a vigorous, drought-resistant, disease-resistant grass with a wonderful appearance when properly maintained. Because of its vigor and aggressiveness, greens will become "puffy" and matted unless growth is controlled by the right management. Frequent vertical mowing is needed to maintain a good putting surface with Tiflawn. Include adequate vertical mowing equipment on your construction funds list.

You may be wise to consider other types of improved bermudagrasses such as Tif-fine, Bayshore, Everglades.

Q—Everyone says that a golf course should be designed for easy machine maintenance. Could you be more specific as to what that means? (Tenn.)

A—Good drainage is an important factor in machine maintenance. Soil should be sufficiently well-drained that it will be ready to bear traffic of mowing and aerifying equipment in the spring.

Avoid steep slopes and abrupt changes in levels that are difficult or impossible to maintain with machines. Aprons and collars around greens should be wide enough to allow turning of machines outside the putting area. Traffic lanes for carts must be designed to avoid damage to critical playing surfaces. At every turn ask yourself, "Will this require hand labor?"

"GOLFER'S CREED"

Jack Level of Golf Book Service, 42-05 Layton St., Elmhurst, N. Y., has some highly attractive color reproductions of David A. Forgan's classic "Golfer's Creed," which are going fast as clubhouse decorations.