

Grau Answers Turfgrass Questions

From many courses Dr. Fred V. Grau gets and answers the problems handled in this monthly department of GOLFDOM. Superintendents and club officials can avail themselves of this service without charge or obligation. Address your question to Grau Queries, GOLFDOM, 407 S. Dearborn, Chicago 5, Ill.

MANY books which you have read start out thus: *Principles of Chemistry, Principles of Biology, Principles of Soil Physics* and so on. Even before you open the book you know you will be reading basic laws of a subject, enabling you to build a firm foundation with which to understand more detailed information which will come later.

Many supts., architects and builders are deeply concerned with the principles of putting green construction. A suitable foundation is needed for successful future maintenance. What are the basic laws upon which architect and builder can draw so that, when they turn the finished green over to the supt., it will be the best that can be produced, the easiest to maintain and in harmony with nature? We need to consider principles underlying several natural or mechanical functions among which are:

1. Principles of Drainage, wherein we are concerned with three essential phases:

a. Subsurface drainage, with a stone base, porous subsoil or tile in various patterns;

b. Internal drainage, accomplished by providing porous, well-aerated soil allowing excess water to move rapidly through it, but enabling the soil to retain sufficient moisture to grow grass for maximum periods between irrigations;

c. Surface drainage, *without pockets*, to quickly remove excess water from the playing surface, allowing a high degree of control over the quantity of water which enters the soil.

More than anything else, the architect and builder need to know:

2. Principles of Plant Growth. A fundamental principle is that **grass roots absorb oxygen**. Without adequate supplies of oxygen in the soil, roots cannot absorb nutrients, neither can they use the available

water. Failing to observe this basic law in construction will result in a green that is less than satisfactory.

The above facts are associated with:

3. Principles of Soil Physics. For some unexplainable reason this phase of construction has received scant attention. "Rule of thumb" and "guesswork" describe most attempts at providing the most desirable mixture of available materials for creating the best green. Soils labs have scientists and equipment for evaluating porosity of mixtures of materials. More complete utilization of facts known about soil physics should ease the lot of those responsible for green maintenance and who will have to live with the problems that arise before maintenance begins.

Q — What's the best way to drain a green at the bottom. Some say tile, some, stone. Others say all of this is "bunk." (Tenn.)

A — The best way to accomplish sub-drainage is to provide a system that will remove excess water quickly. If the subsoil is gravel or sand that is well-drained you need spend no money for a drainage system — nature has provided it for you. If subsoil is heavy with a high percentage of clay, a drainage system is essential. The herringbone pattern with tile is expensive but highly effective. With ample local supplies of cheap crushed stone, a stone blanket would be cheaper and reasonably effective. In extreme cases a dry well (or several) filled with stone or gravel may be needed. Water can be pumped out when it is full. "The best way is the way that gets rid of water the quickest."

Q — What is likely to happen when you mix about 20 per cent of sand with a heavy clay soil to try to "lighten" it? (Tex.)

A — You probably will get a fair grade of concrete. Heavy clay soil requires "enor-