DRAINAGE SPECIAL.

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WHEN DRAINAGE IS NEEDED.

TWO KINDS of soils need draining; those that have too much water, and those that are too shallow. The signs of poor drainage are obvious. Swamps, marshes, meadows and all other low lands on which water stands for any considerable time may be drained, provided there is fall enough to secure an outlet. These low lands may be those which collect surface drainage, or seepage from nearby higher land; or they may be lands that are regularly flooded by fresh water or by tides. Farm land which dries out slowly in spring, making the working and growing season shorter, or on which water stands for a long time after heavy rains, needs to be drained. If water oozes into the furrow, the soil is too wet for good farming.

STUDENTS AT STATE AGRICULTURAL SCHOOL, MAGNOLIA, ARK., LAYING TILES FOR UNDER-DRAINAGE.

The kind of plants that take possession of a field, before it is broken up or after it has been laid down in sod, or after it has been neglected for a year or more, are usually a reliable index to its need of drainage. If bog and water-loving plants become established here and there, especially sedges, rushes and mosses, the soil is too wet. Certain spots in the field, usually the lowest places, will indicate their need of drainage in this way, altho most of the field is all right.

All or these surface indications, however, should be supplement- or verified by an examination of the water-table. Dig a hole in the field from four to six feet deep. If water stands in this hole within three feet of the surface or less, during most of the growing season, it is quite certain that the roots of cultivated plants do not find enough room. air and warmth in that soil to produce the largest crops, The growth of the crops themselves supplies evidence. On poorly drained soils the plants start slowly, look sickly and stunted, and never make the profitable growth of neighboring plants on well-drained soil. Within the boundaries of one field there are often both well-drained and poorly drained places.

There is another class of soils—those that are shallow—that are improved by being drained, but these are not too wet, except for short periods. First, there are the soils that have a hard-pan close to the surface, perhaps within one to three feet. This hard-pan may be a stratum of rock, but more often it is a layer of stiff and impervious clay. The rock hard-pan cannot be improved, but the clay hard-pan can. Water cannot readily penetrate it. It is like the bottom of a shallow pan; when a heavy rain comes, the pan soon fills and overflows, making surface water. This can escape by surface drainage or by evaporation. But such a soil quickly dries out and suffers in a drouth, because it has so little depth. What is needed is to deepen the soil so that it will hold more water.

Still another type of soils—those poor in texture—is often greatly benefited by being drained. These are mostly the clayey soils that get hard, lumpy and unmanageable when dry, and sticky when wet. They are not what would be called wet soils, neither are they shallow, but they are not mellow and they run to extremes, either very dry or very wet. It is impossible to work them early in spring. Heavy rains put them in such a condition that they cannot be cultivated for several days after the crops begin to need tilling. The surface bakes and cracks. Such soils are improved by plowing under a green-manuring crop, by under-drainage, or by both, In many cases the addition of humus is sufficient to bring the soil into good heart; in extreme cases under-drainage must be called to the aid of humus.—Dr. S. W. Fletcher in "Soils."

FEATURES OF THIS ISSUE.