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SOILS OF MISSISSIPPI.

BY W. L. HUTCHINSON.

SOIL MANAGEMENT.

The problem of good land is a most important one to any state or nation and to present as well as future generations. Farm practices that result in lessening the productiveness of land are unnecessary and undesirable and for a people to have the habit of following such practices is most unfortunate. Land can be improved and its productiveness increased just as easily as it can be worn out or its productiveness decreased and whether it takes the one course or the other depends entirely on the farmer and what he does. Mississippi farmers have grown up with the idea that cultivated land must needs wear out and be abandoned for nature to again make it fit for cultivation. They have passed from youth to old age and have seen this thing obtain and they are disposed to accept it as a matter of fact. And a farmer, like faith, "when once wedded fast to some dear falsehood hugs it to the last."

The annual tax.—One crop for this state represents a value of at least one hundred million dollars. By drainage and tillage Mississippi farmers could, in one year, double their present crop so that the tax they now pay for poor drainage and indifferent tillage must needs be one hundred million dollars annually.

Properly managed, soil may be cultivated forever and be better at the end than it was at the beginning. Good farms are made by those who manage them—new farms are not the best farms. Farming should be conducted on the basis that the value of the farm would increase with the centuries. Some spot or part of the farm may be made better each year. It usually takes a century of good management to make a good farming country.

Five things to do: (1) So drain the land that water will not stand on or near the surface; (2) Practice good tillage; (3) Prevent uplands from washing; (4) Keep an adequate supply of humus in the soil; (5) Make the farm attractive and even beautiful.

Drainage.—Last year (1909) water standing on or near the surface, during seasons of excessive rain, caused thousands of farmers to fail with their crops. The excess of this injury, over what it is normally, amounted to one-third of a normal crop—the money value of the shortage would have been about forty million dollars. This simply represents the excessive damage for an abnormal season. A better idea of the total damage may be had from the following data: The Delta Station owns and farms 200 acres of land on Deer Creek. This land had been in cultivation for nearly a century prior to the establishment of the Station. The practice had been to plant nearly all the farm in cotton and a yield of sixty bales for the farm was regarded as very satisfactory. The Station plants about ninety acres in cotton each year and has averaged, each year, a bale to the acre. Some simple, inexpensive surface drainage was mainly responsible for the increase in yield, which was certainly more than double what it had been. Similar injury, or lessening of yield, occurs on a majority of the farms in this state because of standing water on or near the surface during periods of excessive rain. The necessary drainage to prevent such injury could be had as easily as it was obtained at the Delta Station.

Any farmer can drain his land and, when he is looking for some means to increase the productiveness of his farm, and, also, the profits derived from it he may begin draining every place where water stands on or near the surface during wet weather. The trouble is not that the farmer cannot but because he will not. Standing or gravitation water should not be nearer than three feet of the surface.

Open ditches, properly made, may be used for most of the drainage but on every farm there will be cases where covered drains will serve better. Every farmer knows how to make a blind ditch and when properly placed they may be very valuable.

Open ditches for drainage should not be made with a spade. They should be several times wider at the top than at the bottom, thus giving the sides a very gentle slope. They are easily made with teams, plows and scrapers, or, with road machines. On many plantations a road machine could be made one of the most useful implements on the place.

A great many farmers could do more or less tile drainage each year. After seeing tile properly laid a farmer may put in his own tile and the cost for the tile would only be about \$100 a mile. By putting in one mile of tile each year the problem of drainage would soon be solved on the majority of farms.

Standing water not only injures the growing crop, (as so many farmers believe) but it injures the land as well. To get only half a crop a year, and some years not even that much, is a heavy tax to pay for indifference as to those things that determine the yields of crops.

Tillage.—As generally practiced in this state, the tillage is not good. The plowing is not good; the harrowing is not good; the cultivation is not good. And yet, good tillage is a simple matter when you have good implements and plenty of teams. But good judgment is necessary in order to secure good tillage economically.

The farmer may not say that any old condition of the soil is equally good for growing crops. He knows that there is one condition that is better than all others and yet he does very little with a view to keeping his land in this best condition at all times. All crops do best when the soil is fine, moist and mellow. This same condition of the soil is best for seeding. To get the soil in this fine, moist, mellow condition, preferred for all kinds of seeding and by all growing crops, we plow and harrow and cultivate. Rarely should it be necessary for the farmer to cultivate to kill weeds for if he cultivates often enough to keep his soil in the best condition there will be no weeds to kill. (It may be necessary to say to Mississippi farmers that crab grass is their worst weed.) Land may be plowed for the purpose of turning under organic matter.

If land is plowed six inches deep it is well plowed. If the plowed land is harrowed until it is free from lumps and is fine, moist and mellow it is well harrowed. If the surface be then well cultivated once a week or once every ten days it will keep the soil in good condition for a season.

Rain and grass.—On occasion it rains and it rains so that the weekly cultivation of the surface is interfered with and crab grass makes such growth that the cultivators will not handle it satisfactorily. Crab grass is such a bad weed that it should be killed as quickly as possible and to this end use those implements that will clean the crop in a few days and then resume the frequent tillage of the surface with the cultivators. Crab grass seriously injures crops, hence do not let it grow. Continued rain should be the only excuse for the presence of crab grass in any crop.

The surface soils at the McNeill Station are a sandy-loam. The sub-soils are clay or sandy-clay. Trials were made to determine the influence of deep plowing on these soils. The deepest plowing was eighteen inches and the shallowest, four inches. The depth of plow-

ing did not have any influence on the yield of crops. Both the texture and structure of these soils are naturally good. What these soils need is manure, not plowing, and yet the farmer's thumb rule is: "Plow deep while sluggards sleep and you will have corn to sell and corn to keep."

The clay lands in the state stand more in need of good plowing. The farmer with clay land may plow six inches deep or just as much deeper as he pleases.

Ridge or flat culture.—Ridges or beds are made for drainage and not for any advantages in cultivating the crop that they offer. They are very expensive and exceedingly inconvenient and stand much in the way of good cultivation of the surface but beds are helpful on poorly drained land. The prevalence of ridge culture is merely an indication of poor drainage.

To prevent washing.—As the surface soil is the productive part, and the only part that will grow crops, if this be allowed to wash away as regularly as the rains come it is only a self-evident proposition that such areas will remain unproductive as long as the surface soil is removed by each succeeding rain. No management can make an area productive if the surface is regularly removed by any agency. How patient and tolerant Mississippi farmers have been while water has steadily taken away the productive, and hence the valuable parts of their farms. If any other agency should attempt to take the best part of a man's farm from him he would show enough spirit to object to such procedure, but as the agency is water, he submits without even a protest, but the farmer's easy submission does not lessen the damage. And how great has been this damage in Mississippi!

Terraces and sod.—Upland areas that suffer from erosion may be handled to best advantage by the use of such drains and terraces as will make the surplus or run-off water move s-l-o-w-l-y. Where this does not suffice, a sod must be added.

The fine silt soils of the brown loam region suffer most from erosion. These soils, just after a freeze, behave as though they actually dissolved like sugar and a sod is the only thing that will prevent this action—but even a sod of lespedeza will prevent it. We have had no trouble preventing washing where both terraces and sod were used.

Two systems designed to control surplus or run-off water on upland areas may be described. One system consists of a series of embankments or high beds without any fall or grade except a little at the ends. The rows are, also, without any fall and mainly parallel to the embankments. If a hillside plow, that turns every furrow

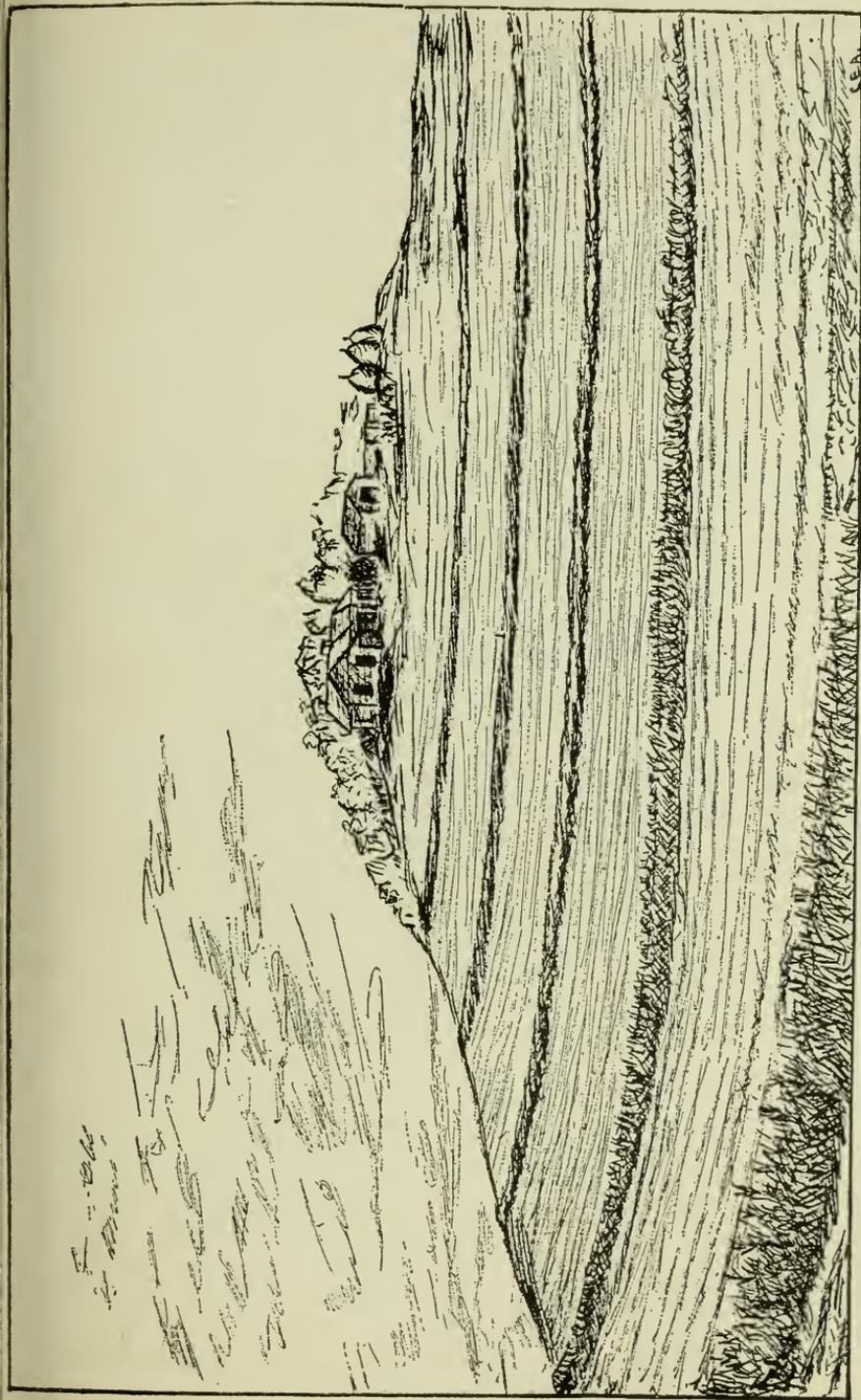


FIG. 1.—SHOWING LEVEL EMBANKMENTS.

down hill, is used in breaking the tendency will be to bring each space between embankments to a level surface. Where each furrow is turned down hill the lower edge of the plat is elevated and the upper edge lowered. A good reversible disc plow makes a splendid hillside plow. See Fig. 1.

A second system consists of broad, well made embankments having a fall or grade of about seven inches in a hundred feet. These embankments should be at least six feet wide. The soil for making the embankments should be taken from the upper side thus making a broad shallow drain or ditch. The rows may best parallel the embankments. This will tend to concentrate the water in the hollows or low areas or where the natural contour of the surface tends to concentrate it. At these points a short cross terrace is made to take the water from the rows and conduct it to the main terrace below. With this system there is no loss of land nor interference with farm machinery and the water can always be made to move s-l-o-w-l-y at every point. See Fig. II.

The perpendicular distance between terraces in the first system is four feet and in the second, eight feet; thus making the level terraces twice as numerous as those having a fall.

The loss of productive soil by erosion has been very great. It means poor land while it continues.

Humus.—Decaying organic matter in the soil is one of the most important ingredients. The natural method of improving soil is to increase the amount of humus in it. The farmer's method for wearing out soil is to lessen the amount of humus in it. It helps the soil just as much for the farmer to add humus to it as it does for nature to add it. The farmer can add humus to the soil just as well as nature and, as is always the case, he can beat nature when he tries. Stable manure makes good humus—better than that supplied by nature.

Organic matter bears about the same important relation to the productive power of soils that the key-stone does to the strength of the arch. The key-stone is always put in the arch.

The amount of sand and clay in a soil may remain fairly permanent, but not so with the organic matter. Farmers that improve soils add organic matter to them. If an adequate supply of humus is kept in cultivated land the farmer must regularly add organic matter as that in the soil constantly diminishes. The failure of Mississippi farmers to give this matter proper attention has not been the least of their many costly omissions.

The use of stable manure and the plowing under of crops or parts of crops is the farm method of adding humus to cultivated

lands. While any organic matter is good some is better than the other. Stable manure and restorative or clover crops are the very best types of organic matter for the farmer to plow into his soil.

A number of restorative crops are available for the improvement of Mississippi soils. We may mention lespedeza, cowpeas, soy-beans, velvet beans, vetch, melilotus, alfalfa, red, white and bur clover.

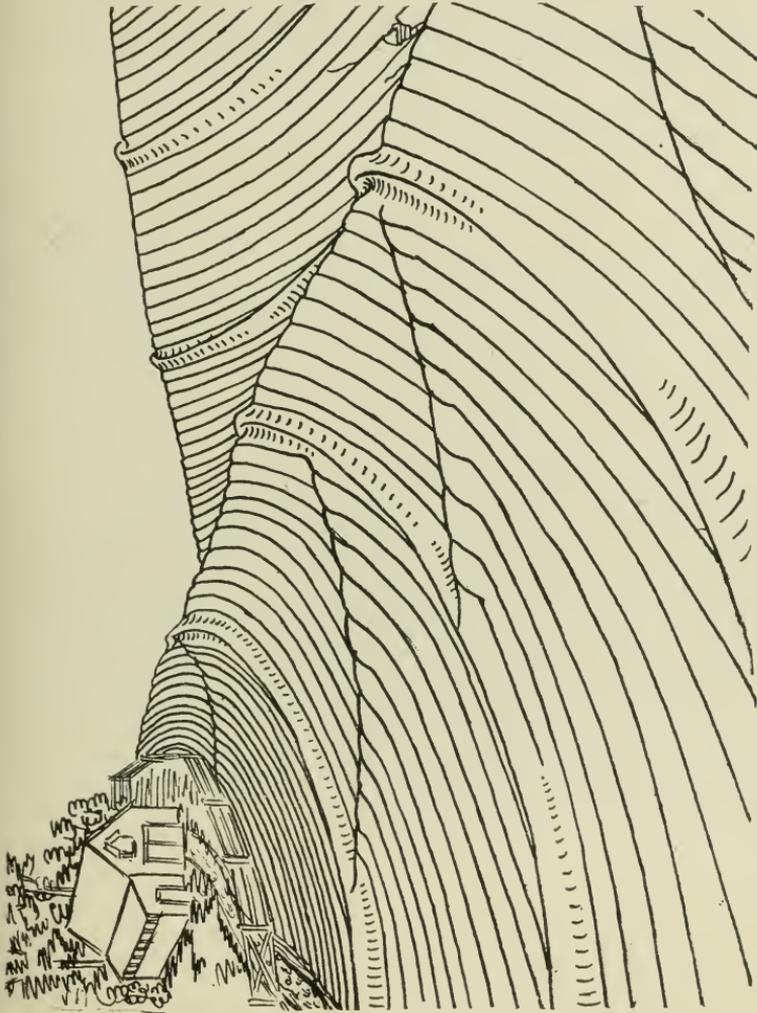


FIG. 2.—SHOWING DOUBLE SYSTEM OF EMBANKMENTS. ALL ROWS AND EMBANKMENTS HAVE SMALL FALL.

Cowpeas, soy-beans and velvet beans may be grown with corn. Vetch may be grown with oats. Cowpeas or soy-beans may be grown the same season after oats. Lespedeza is a great plant for improving soils and is one of the best pasture plants. Melilotus is a valuable

plant on lime soils. Alfalfa grows well on buckshot or black prairie soils and none of the legumes improve the land more.

Cattle fed on cotton seed products produce manure of the greatest value. Indeed everything is favorable for keeping an adequate supply of humus in the soil whenever there is the proper farm management.

The functions of humus are numerous. It has to do with furnishing both food and water to plants. It has to do with germ life in the soil and with the texture and temperature of the soil.

Neatness.—"The apparel oft proclaims the man," and it pays to have a neat farm. A farm that looks like a step child will have scrub stock. It will lack drainage. The tillage will be poor. The uplands will be seamed with gullies. The soils will be deficient in humus. The farmer will buy corn and meat because corn is the basis for hogs and corn will not grow on poor land.

NOTE.—The Mexican cotton boll weevil prefers a neglected farm with cotton as the only crop grown.