

PRINCIPLES OF FARMING.

FALL-BREAKING AND PREPARATION OF THE SEED BED.

Deep Ploughing, Not Less Than Eight Inches, Is Necessary in Order to Obtain the Best Results From the Soil—Deep Fall Ploughing Unadvisable on Sandy or Semi-Arid Lands.

Upon the inauguration of the Farmers' Co-operative Demonstration Work in the Southern States, it was found necessary to outline some of the fundamental principles of good farming and to insist that the tillers of the soil become familiar with them and practice them as a first step in the betterment of farm life. These principles are as follows:

- (1) Prepare a deep and thoroughly pulverized seed bed, well drained; break in the fall to a depth of 8, 10 or 12 inches, according to the soil, with implements that will not bring too much of the subsoil to the surface. (The foregoing depths should be reached gradually if the field is broken with an ordinary turning plough. If a disk plough is used, it is safe to break to the above depths at once.)
- (2) Use seed of the best variety, intelligently selected and carefully stored.
- (3) In cultivated crops give the rows and the plants in the rows a space suited to the plant, the soil and the climate.
- (4) Use intensive tillage during the growing period of the crops.
- (5) Secure a high content of humus in the soil by the use of legumes, barn yard manure, farm refuse and commercial fertilizers.
- (6) Carry out a systematic crop rotation with a winter cover crop on Southern farms.
- (7) Accomplish more work in a day by using more horse power and better implements.
- (8) Increase the farm stock to the extent of utilizing all the waste products and idle lands of the farm.
- (9) Produce all the food required for the men and animals on the farm.
- (10) Keep an account of each farm product, in order to know from which the gain or loss arises.

It is the purpose of the Farmers' Co-operative Demonstration Work to insist upon such preparation of the soil as will furnish the best feeding grounds for the roots and such as will provide at all times plenty of moisture and food for the growing plants. It is better to secure 10 or 12 inches of well-drained, thoroughly pulverized soil filled with humus than to go deeper at the expense of less thorough preparation.

The presence of heat, air, and moisture is essential to chemical and germ action in the preparation of plant food in the soil. The depths to which these penetrate the soil in the South depend upon the depth of the ploughing, provided the soil is well drained. There is no use in ploughing down into a subsoil full of water.

It has been proved without question that the roots of plants penetrate the soil deeper and feed deeper in deeply ploughed land. Thus, in general, it may be stated that when the soil is ploughed 3 inches deep the plants have 3 inches of food, when ploughed 6 inches deep they have 6 inches of food, and when ploughed 10 inches deep they have 10 inches of food. The fact that the bottom portions of the ploughed land are as rich in available plant food as the top portions shows the necessity of getting more air and heat down to them by deep tillage.

The soil requirements most essential to the growth of plants are heat and moisture. Deep breaking insures air and heat at a greater depth.

For plants to do their best there must be in the soil a constant supply of moisture, so that a film of water can envelope the soil particles and absorb nutritive elements. The hair roots of plants drink this nourishment. If there is any more than enough to serve as films for the soil particles and capillary water, there is too much, and it should be drained off. This can be determined by digging a hole 20 inches deep. If there is standing water in the bottom of the hole, it indicates that there is too much water in the soil or subsoil.

The capacity of a given soil to hold film and capillary moisture depends upon how finely it is pulverized and upon the amount of humus in it. Unploughed lands retain but little water. Thoroughly pulverized soil 3 inches deep cannot store enough to make a good crop.

In all Southern States there are every year periods of drought, sometimes not serious, but generally sufficiently protracted to reduce the crop. The remedy for this is increased storage capacity for moisture. This can be accomplished by deep and thorough tillage and by filling the soil with humus (partly decayed vegetation.) The effect of deep tillage has been explained. The effect of humus is to increase greatly the storage capacity of soils for water

and to reduce evaporation. A pound of humus will store seven and one-half times as much moisture as a pound of sand, and the sand will lose its water by evaporation three and one-half times more rapidly than the humus. A clay soil will store only about one-fourth as much moisture as humus, and will lose it by evaporation twice as rapidly.

Plants use an enormous quantity of water. An acre of good corn will absorb and evaporate during its growth nearly 10 inches of water. About three-fourths of this amount will be required during the last seventy-five days of its growth, or at the rate of 3 inches of water a month. This is in addition to evaporation from the soil, which, even with the retarding influence of the dust mulch, will amount to several inches each month in midsummer. In case the land is ploughed only 3 or 4 inches deep, though thoroughly pulverized, it will store an amount of moisture entirely insufficient to supply crop requirements in any protracted drought. These shallow and generally poorly prepared seed beds are the principal cause of the low corn yields in the South, and they affect the cotton yields similarly, but not so much, because cotton is a more drought-resistant plant than corn. If planting is done at all, it is folly to prepare a seed bed so shallow as to bring about the almost total loss of the crop some years and a reduced crop every year.

Many farmers plough or cultivate their corn nearly as deeply as they break their land in preparing a seed bed, this leaves no space for roots in the pulverized and aired soil. Roots occupy a large space. If all the roots of a single vigorous corn stalk were placed end to end they would reach more than a mile, and if allowed by the ploughing they will fill the soil to a considerable depth and feed in all portions of it. In the principal corn-producing areas of the South the annual rainfall is 35 inches or more, and here in a soil properly prepared for corn the great body of the roots will lie from 3 to 12 inches from the surface and will feed within 2 inches of the surface if allowed by shallow cultivation.

Ploughing 3, 4, 5 or 6 inches deep is only common ploughing. In our instructions nothing less than 8 inches is considered "deep" ploughing. We are not advocating a single breaking of 8 inches in depth once in two or three years, but the preparation of an 8 to 12 inch seed bed thoroughly pulverized and filled with humus. It is not intended here to insist that this should be done at once in all cases. These are the depths that must be reached finally to secure the best crop results. The farmer must determine how soon he can secure these depths under his conditions.

Always plough in the fall before the winter rains set in—the earlier after the 1st of October the better. Always use a cover crop of oats, barley, wheat, rye, vetch, or crimson clover, if possible. Every observant farmer has noted that seeds germinate more quickly and that plants grow more rapidly on fall-breaking than on spring-breaking. Fall-ploughing renders more plant food ready for use, while the preparation of the land in the fall saves work in the spring, when everything on the farm is crowding. A cover crop is a net gain. It keeps the soil from washing, if it utilizes the plant food that otherwise might escape into the air, and it adds humus. The soil is improved by the crop, and winter grazing is provided. In ploughed land properly handled, the loss of plant food is less than in unploughed land; more plant food may be produced and more can be stored. In case a cover crop is used the loss of plant food is slight.

An objection is sometimes urged that fall-ploughed soil becomes saturated with water during the winter and remains wetter and colder later in the spring than land left unbroken in the fall. This is true only upon land not sufficiently drained and where the breaking is shallow. Water passes through deep breaking readily, and with reasonable drainage it is ready for planting earlier than lands broken in the spring.

With deep breaking and an abundance of humus it will be possible to dispense with many terraces and yet have no washing of the soil. Terraces are seldom required on the steepest hillsides of the North. Deep freezing opens the soil for the absorption of the rain.

When land is nearly level, with a stiff subsoil, it should be flat-broken, but left in ridges or narrow lands about 5 or 6 feet wide, suitable for planting, with a dead furrow between. This provides winter drainage and keeps the pulverized soil out of the water, which is important even if unbroken.

Is It Advisable to Plough Deeper than 8, 10 or 12 Inches?

The depth of ploughing must be determined by the farmer himself. He knows the conditions and is the best judge of the cost. In many sections, if done in the fall it undoubtedly pays to subsoil 15 or 20 inches. This has been proved by some of the

best farmers and experimenters in the world. Some subsoils in humid climates have been made so close and compact by the abundant rainfall that air does not penetrate them to aid in preparing plant food. Such fields, therefore, may not show any benefits of subsoiling until after two or more years.

It rarely pays to subsoil land in the spring, and it is never advisable to use the subsoil plough when the subsoil is fully saturated with water, even though the surface be fairly dry. Under such conditions of ploughing the clay subsoil is pressed and packed, when the object is to pulverize it and allow the air to act upon it.

Exceptions to General Rules For Deep Fall Ploughing.

(1) Never plough below the line of standing water in the soil, because the subsoil cannot be pulverized in water. The water level must first be lowered by drainage.

(2) Do not deep fall-ploughing on light sandy land or dry, semi-arid plains, and this especially applies to elevated sandy lands of the South. Such lands can be helped by adding humus and using a winter cover crop.

(3) The object of deep fall-ploughing is mainly to increase the supply of plant food and the storage of moisture in the soil. While this preparation is of great value on rolling lands and nearly all fields so long in cultivation that plant growth is medium or less, there are some soils that for the production of cotton had better not be deep fall-broken, such as very rich and moist river bottoms and the virgin black-land prairies of the Gulf States, for the evident reason that there is too much plant food for cotton already available in the soil, with abundant moisture—conditions that make for an excessive growth of the cotton stalks and a consequent decrease in fruitage—even under ordinary conditions. For the cotton crop upon such lands it is better to plough very shallow in the spring and bed upon the firm soil.

(4) Do not plough deeply or subsoil in the spring. The subsoil is generally too full of water, and it is too late for much effective action of the air upon the soil for the winter rains to firm the subsoil before planting for cotton.

(5) Thin gray soils underlain with yellow or stiff clay near the surface, most of the post-oak flats, and the comparatively level coast lands should be broken in ridges (black furrows) 5, 6, or 7 feet wide, according to the crop to be planted. Cotton and corn may be left thicker in the row, to offset the wider space between the rows. The dead furrow between the rows should be double ploughed and made as deep as practicable, with a good outlet for the water. This method will gradually deepen the soil, increase drainage, reduce washing and give a larger and deeper body of loose, aired earth for the roots. This plan is excellent when surface drainage is necessary. Soil to be live and friable must be kept out of standing water winter and summer.

The sugar planters of Louisiana all use the ridge method (generally 7 feet wide) for both sugar cane and corn. The dead furrow is as deep as a plough drawn by four or six heavy mules can penetrate at the last breaking. This gives an average depth of tillage of 12 to 15 inches.

The adoption of the ridge method on demonstration fields in the Yazoo Delta in 1906 increased the yield of corn from 14 bushels per acre to 70 bushels. No fertilizer was used.

In case no winter cover crop is used the soil should be disked or harrowed two or three times during the winter, provided it is dry enough. Give good drainage to all parts of the field.

Any cultivation done after the deep fall-breaking should be shallow—not more than 3 or 4 inches deep. S. A. Knapp.

Special Agent in Charge, Farmers' Co-operative Demonstration Work.

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UNCLE SAM, THE MEDDLER.

Citizens of Central American Republics Protest Against America's Course Toward Nicaragua.

Mexico City, Dec. 14.—Resolutions ratified last night at a mass meeting of the Central American people in Mexico City, denouncing the action of the United States in reference to Nicaragua and Zelaya, were mailed today to President Taft and Secretary Knox. They are in part as follows:

"That the government of the United States has no right to interfere in the internal affairs of Central America, despite the reasons stated by you, and we affirm that the purpose of your government is to consummate an offense against Nicaragua, through the arousing of political passions and taking advantage of credulity or disloyalty of some Central Americans;

"That Nicaragua has grounds to consider that the political revolution has been promoted by the government of the United States and has the perfect right to claim from that government an indemnization sufficient to pay for the loss of life and interests which your government has caused with its irregular proceedings;

"That if the government of the United States had sought in good faith an equitable and impartial solution of the conflict, it would have adopted at once the mediation offered, according to the declaration of the Mexican government to the press.

"We declare that your note is opposed to the sovereignty and dignity of our common country, but principally to the republic of Nicaragua; that we consider that the note is not inspired by a government friendly to our people, and in consequence we protest against the aggression which your government is practicing against Nicaragua and we call upon all of our countrymen in Central America and abroad to be on the alert with respect to the dominating and absorbing tendencies of the American government in order that should the occasion present itself, they may act as the patriotism and importance of our five republics require."

NICARAGUAN CAPITAL REVOLTS.

People of Managua Openly Denounce Zelaya.

Managua, Dec. 14.—The people of Managua are in open revolt against Zelaya without check from the police. They are crowding the streets and giving vent to unrestrained denunciation of the administration. Shouts of "long live liberty," "long live the United States," "long live Mexico," "long live Estrada" are heard on every side.

The street demonstrations began last night, following denunciatory speeches in Congress and the temper of the people was madly excited by the report that a battle had been fought and won by Vasquez, commander of the Zelayan forces around Rama and that Vasquez had massacred a large number of revolutionists. With this report came the additional rumor that Vasquez had violated the armistice and it was not considered likely that he would do so unless by instructions from Zelaya. These reports lost nothing in passing from mouth to mouth. As the Mexican minister was the guarantor of the armistice, it is stated that that official will ask for his passports unless satisfactory explanations are made.

The whole country is in a ferment. Zelaya is denounced on every hand, but he is master of the situation, and the people fear a wholesale execution of political prisoners as a parting shot. The prisons are full of men, most of whom are in a half starved condition and doubtless would welcome death.

The people openly demand American intervention and vigilantes have been organized to prevent the escape of the President.

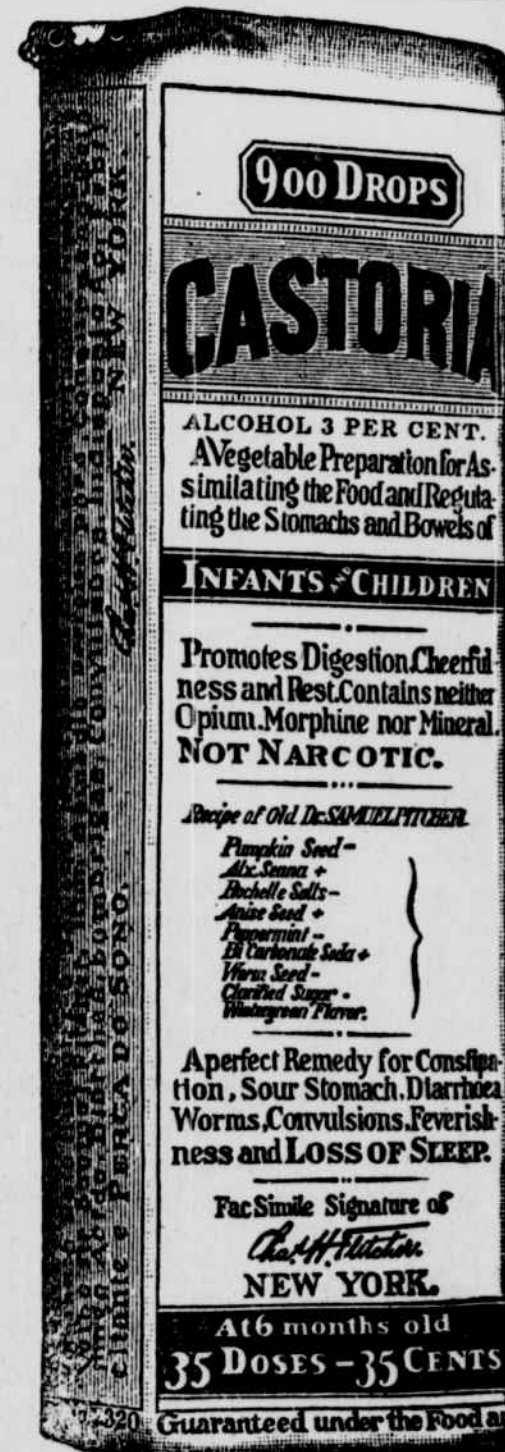
A serious danger threatens, for the American concessionaire of the electric lighting declares that he will put the whole city in darkness if money due to a large amount is not paid before noon tomorrow. This bill amounts to 109,000 pesos, and it is hardly likely that the demand will be met.

The American vice counsel, Henry Caldera, has stuck to his post and conducted the business of his office under conditions of considerable danger.

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