

The Importance of the Dry Farming Movement and Means for Supporting It

By President John H. Worst at the International Dry Farming Congress of 1911

There is encouragement throughout President Worst's address for the dry land farmer of today, and yet more for the dry land farmer of the future. The great need for the present is the systematic working out of dry farm problems. Scientific agriculture of today is based upon humid agriculture. The great work of the future must have special reference to the great areas of the world's surface which are visited by less than twenty inches of annual rainfall, an area comprising nearly one-half the surface of the globe. The bread of the future will come largely from the desert of the past.

To overcome the apparent obstacle of limited moisture seems all the greater because agriculture, as popularly understood and practiced in most countries, is the product of humid conditions.

As an art, modern agriculture was cradled and nurtured in regions of abundant rainfall. The practice of moisture conservation by means of tillage is seldom resorted to, notwithstanding periodical drouths have been, in all modern grain growing countries—humid though they be—one of the chief scourges of the husbandman. The clouds are relied upon to water the fields when the crops require it, save in strictly arid countries where irrigation direct is sometimes resorted to. If the clouds fail to send copious showers in season, the crops suffer or fail, regardless of the moisture that falls out of season. Thus it occurs that within the tropics, where sixty inches of water falls during the rainy season, crops frequently suffer from drouth during the dry period that follows. The system known as dry farming has a place, therefore, in all agricultural countries, and is not confined alone to regions of limited rainfall.

Local Conditions Vary

The quantity of water that is actually required to mature any particular crop has been so often ascertained and under such varying conditions that within reasonable limitations the minimum is readily determined. Add to this minimum the amount of natural and unavoidable loss on account of capillary evaporation and the problem is solved, so far as determining the quantity of moisture that is required during a single season for any specific crop is concerned. This naturally will vary with conditions of soil and climate, all of which must be taken into account, for the problem varies with locality. In short, local conditions are the essence of the dry-farming problem.

Soil conditions vary widely, yet the scientific principles involved in dry-farming apply quite universally in all regions of limited rainfall.

The fact that conditions vary widely on account of latitude, texture of the soil, elevation, etc., each affecting rapidity of evaporation, involves the dry-farming problem with complexities that call for investigations at once serious and exhaustive. For not only those contemplating settlement within the semi-arid regions, but for thousands of families already located there and that have staked their all, should the road to successful agriculture under dry-farming conditions be speedily made, and made as clear as possible. This calls for the dissemination of all available data on the subject and, in addition, the fullest investigations that money and trained experts can make, and the work will continue for many years to come. The cause is worthy of scientific research, highly organized and far-reaching, but should be sufficiently centred upon the pivotal question—moisture conservation and the breeding of drouth-resisting plants—to enable the farmer to adjust himself to Nature's demands, that he may prosper in proportion as he obeys her mandates.

Dry Farming a Necessity

The fact that nearly half the earth's surface is visited with less than twenty inches of annual precipitation makes dry farming a necessity. But a fraction of this vast area is susceptible of irrigation under any circumstances. What cannot be irrigated must be cultivated by dry-farming methods or remain

uninhabitable and practically useless; for human genius cannot remove barriers, such as mountain ranges, which place a limit upon precipitation. It can, however, suggest methods of agriculture that may be adjusted to local conditions—methods of tillage that will prevent the unnecessary evaporation of soil moisture, together with the breeding of plants, themselves economic of moisture. These factors taken together will tend to make agriculture not only successful but profitable with less rainfall than in humid districts where, as a matter of fact, the total precipitation during the year is frequently far in excess of the needs of the growing crops. Moreover, excess of moisture is likely to prove as destructive of crops as deficiency of moisture and far more injurious to the land. The fact must be admitted that the swamps and the sea receive a tremendous annual toll of plant food resulting from the "run off" of humid countries. This loss of fertility, which is beyond estimate, must be made good by some means, so that, between restoring lost fertility and installing drainage systems, the humid countries are quite as severely vexed as the semi-arid countries.

Rewards About Equal

Considering the actual expenditure of capital and labor in either humid or semi-arid countries to insure agricultural success, the rewards should not vary greatly, or they will not vary

becomes master of Nature's manageable forces and acquires the requisite knowledge and skill to adjust his energies to her demands, can he take his place and rank among the truly great men of action.

The further we press our investigations and scientific research, therefore, the more apparent seems the wisdom of God for thus preserving by means of limited rainfall, the precious plant food over so large a portion of the earth's surface. What hitherto has been looked upon as the curse of drouth may yet, in the light of science, be interpreted as the mercy of an overruling Providence.

The Future Depends Upon Dry Farming

Human ingenuity is still aggressive. Our wants are never satisfied. What undiscovered forces has Nature yet under cover? Who knows? For science has advanced, for aught we know, but little beyond the kindergarten of discovery. But just as surely as power machinery was invented in due time to relieve the ever increasing strain upon human muscles; and just as surely as the electrical transmission of intelligence was invented to meet the growing demands of business—just as certainly, and by the same token, the bread of the future will come largely from the desert of the past.

Millions have been donated, during recent years, to advance the science of

devote his versatility and his tireless energies to field work, to giving direction to agencies organized for the solution of those great problems that gave rise to this dry-farming propaganda.

The Congress would then assume the dignity of an institution, with permanent headquarters and with departments for experimentation and demonstration, with lecture bureaus, dry-farming experts and advisors, collectors of statistics and other important data and the maintenance of an energetic publicity department for the dissemination of scientific literature and general agricultural information. The extent and effectiveness of these and other agencies that should be organized would depend upon the funds made available for the purpose.

Semi-Arid Differs From Humid Agriculture

It is not contended that semi-arid agriculture will be of the same character, or even very similar to that practiced in regions of more abundant rainfall; nor that the farm unit will correspond with the smaller units of more humid countries. Such questions as size of farmstead, crop, and live stock best suited for successful dry-farming and methods of tillage and farm management to be employed must be determined, ultimately, by experiment. The end sought, however, is to put the land to use; to cause it to create wealth instead of sage brush; to support population; to make homes.

It is unreasonable to conclude that semi-arid land is worthless. If not worthless, then what was it made for? What is the best use it can be put to? To determine these questions is the task that confronts us. Are they worth determining? Most assuredly. They should be determined at any cost and without waiting for individual settlers to find the solution, oftentimes at the expense of their slender savings and the comfort of their wives and children.

When this nation and the several states shall awaken to the importance of educating the great producing class, the farmers, in the art and science of their calling, as it has been laboring so zealously and so expensively to prepare a learned aristocracy to live off the other fellow, then indeed will the shadows rise and the mercies of God be better understood by the sons of men. Moreover, when the children in our public schools shall study the soil and moisture, the sunshine and the air, and their relation to plant and animal life as zealously as they have been compelled to study Caesar and higher mathematics, a new attitude toward agriculture will result and more rapid strides will be made toward acquiring "dominion over Nature."

AMOUNT OF WATER WHICH MAY BE STORED IN SOILS

Actual experiments show that the actual field water capacity of arid soils varies from 14 per cent. for a very sandy loam to eighteen per cent. for a clay loam, with an average of about 16 per cent. The greatest water capacity would be even more. At this rate every twelve inches in depth of soil can hold from 2.25 to 2.65 inches of water, or an average of 2.45 inches. At this rate it is possible to store approximately 20 inches of water in the upper 10 feet of soil. This is from one and one-half to two times the annual rainfall over the better dry farming sections. Therefore, it should be and is possible to store one or two years' rainfall in the soil, by using proper tillage methods. —D. W. Frear, Colorado Agricultural College.

DISCUSSION REQUESTED

Peculiar interest attaches to the problems of dry farming as the International Dry Farming Congress for 1912 will be held at Lethbridge. The Guide would be glad to receive letters from its readers discussing the various phases of the dry farming question. What has been your experience? It will help others. What are your troubles? Others will solve them.

greatly when the principles of dry-farming have been given a fraction of the investigation and study that has been given to humid agriculture. The tendency to take chances—the curse of the husbandman—however, is more likely to prevail in humid and sub-humid countries than in semi-arid countries; for in the latter, no gambling in timely showers is warranted and the farmer knows it. He must conserve the moisture that comes or his harvest will prove a failure. Not so in sub-humid districts, for there the majority of seasons are abundantly supplied with timely moisture. The off seasons, however, are sufficiently numerous to keep the average profits of farming at a minimum. Even in humid regions with twice the annual rainfall necessary to insure maximum crops, occasional drouths make serious inroads in many a farmer's bank account.

Agriculture a Science

Under dry-farming conditions, therefore, agriculture will, of necessity, assume the dignity of a science and the farmer, in larger sense, becomes a scientist. Moreover, the thought and painstaking skill necessary to win success under dry-farming conditions will impress themselves as visibly upon the habits and character of the husbandman as the laboratory impresses itself upon the habits and character of the scientist. For not until the farmer

medicine and surgery, to encourage invention and art and for many other purposes, while agriculture, the burden bearer of all nations and the primary source of all great fortunes, has hitherto received but scant consideration from those who, by their immense wealth, are in a position and seem inclined to become benefactors of mankind.

One million dollars, duly safeguarded and administered by a competent board of directors, and judiciously invested, would afford a reliable income, sufficient to discover and exemplify the methods that will ultimately establish a successful system of agriculture, wherever the soil is suitable for cultivation and the annual precipitation is twelve inches or more. The information gained also would go far toward insuring much larger and surer crops now so frequently jeopardized, even in humid and sub-humid countries, for want of knowledge bearing directly upon moisture conservation and other problems intimately associated with soil management.

Clearing House for Information

With a foundation assuring a permanent and adequate income, conventions of this character would no longer prove burdensome for those commissioned to finance them. Instead of the secretary's time being almost wholly taken up with the unpleasant and irksome task of securing funds, he should