

the ploughed lands with a harrow or cultivator a soil-blanket is formed which shades the water bearing sub-soil and breaks its connection with the exposed surface. In orchard cultivation, during a severe drought, the soil-blanket is often made six inches deep or more; but for cereals, which are surface feeders, the depth should seldom be more than two or three inches. Moreover, this facilitates the sowing, as the seed must be drilled into the moist sub-soil lest otherwise it fail to germinate.

Dr. Macdonald thus summarises what has been accomplished by his Department in South Africa:

(1) That by our system of tillage we are able to keep the soil seed-bed moist for a whole year. This means that, so far as moisture is concerned, we can plant a crop at any season—a most important matter in South Africa. This result has been attained by the use of moisture saving fallows, deeply ploughed, constantly harrowed, and kept covered with a dry-soil blanket which checks evaporation.

(2) That it is possible to grow fry-land winter wheat and to harvest it before the season of rust.

(3) That drilling, as might be expected, is far better than broad-casting, saves seed, places the grain in the moist seed bed, and gives a more even growth.

(4) That thin seeding, for wheat 30 to 45 pounds per acre, gives larger returns than more lavish sowing. This is due to the fact that each individual plant has more moisture, sunlight, and food if given ample space.

(5) That the durum wheats have given the best results. They are the wheats which have extended the wheat belt into the most arid regions of the Western America.

(6) That the durum wheat—Apulia—has been grown under our dry-farming system without a drop of rain falling upon it from seed time until harvest, which proves the efficacy of the moisture-saving fallow, and is a record in modern agriculture.

The method of cultivation on the South African veldt is simple in the extreme and is fully described by Dr. Macdonald:—

“The method of cultivation adopted for wheat is as follows: The virgin veldt is well ploughed, varying in depth from eight to fourteen inches. A disk harrow is then used for the two-fold object of pulverising the clods and stirring the soil as deeply as possible. For that purpose we use a 20 inch disk harrow, A steel-tooth harrow is then passed over the field to form a layer of fine earth on the surface from two to three inches deep. This is

the earth blanket. The land is then allowed to rest, but should it begin to get hard and crack on the surface a light harrow is run over it, which prevents the escape of the moisture and the drying out of the soil. Also, after every rain, the ground is harrowed, and the dry soil blanket restored. A whole year is devoted to such soil culture, and then in the month of May the wheat is sown. It is not necessary to wait for rain, as the soil is then so moist that the seed can be sown at any time. The seed is sown with an ordinary drill, which deposits it underneath the dry soil blanket. When the young plants are a few inches above the ground a light harrow, called a weeder, is run through them.”

It prevents the evaporation of soil moisture, renews the soil blanket, and restores the vitality of the crop. It may be continued until the wheat is eight to ten inches high or even more. Wheat sown in the winter time—viz.: during the month of May—is reaped in November, before the season of rust, which usually occurs in midsummer, that is to say December, January and February. This is, of course, a point of the utmost importance to the wheat-grower. Such was the method by which the Apulia durum wheat was produced on which no rain fell from seed-time till harvest. Side by side with the lands bearing crops are the fallow lands, ploughed and harrowed, waiting for the rain to be absorbed and held for the next planting season. Many farmers in South Africa stand idly waiting for the rains in order to plough and plant their crops. But the dry-farmer, who prepares his land the year before, can plant early in the season without fear of drought or the risk of late frosts. The soil on the Lichtenburg farm is light, shallow, sandy loam lying on a gravel sub-soil. It is a poor soil for dry-farming, but it is a convincing proof of what can be done by thorough and systematic tillage.”

Thus the Conquest of the Desert is seen to be no fancy of the imaginative and unpractical dreamer but an established fact, and one with which the great grain growing countries of the Old and New World will have to reckon with in the near future. Spread out the map of the world and you will see vast regions marked “The Great American Desert,” the Australian “Never-Never Land,” the South African Kalahari Desert or “Great-Thirst Land.” The lesson is plain. In the words of Dr. Macdonald, “the overthrow of drought walks hand in hand with the conservation of soil moisture. And in place of the barren desert, abandoned homes, and dying cattle, we can now paint a new and glowing picture. There, under a serene and cloudless sky, lies a panorama of green and chocolate brown—mile after mile the growing wheat and the deep-stirred, water-holding fallow. No rain may fall for