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Annual Report for 1914 With the Supplements to the Guide to the Experimental Plots Containing the Yields per Acre, Etc.



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Cultivation Experiments

Rothamsted Research

Rothamsted Research (1915) *Cultivation Experiments* ; Annual Report For 1914 With The Supplements To The Guide To The Experimental Plots Containing The Yields Per Acre, Etc., pp 28 - 28 - DOI: <https://doi.org/10.23637/ERADOC-1-107>

CULTIVATION EXPERIMENTS.

Another method by which the soil conditions may be improved for the plant is to increase the depth of soil over which the roots may range. There are some very old Rothamsted experiments on the subject. In 1849 the Rev. S. Smith, of Lois Weedon, Northamptonshire, attempted to prove that trenching could profitably be undertaken for wheat cultivation. Trenched plots were therefore laid out for wheat in Hoos Field, the method being to bring up the subsoil and bury the top soil. No increase in crop was observed, however. More recently (1909) the experiment was repeated with fruit trees, the trenching being done on the modern method in which the subsoil is kept below and the top soil kept on top. No evidence could be obtained that trenching had any effect either on the growth of the trees, or on the soil moisture or nitrates. Now trenching is not a farm operation, but it is closely related to subsoiling which is usually considered valuable, and in order to clear up the problem some plots have been laid out to test the effect of subsoiling: this year potatoes were grown on them and showed consistent increases in crop. Mr. F. J. Gurney kindly gave us the implement, which worked very well, breaking up the subsoil with a minimum expenditure of labour.

Another experiment has been started on the methods of sowing wheat after potatoes. When the digger has finished its work in autumn the soil is left in a beautifully fine tilth eminently suitable for the nitrification processes. How can this best be utilised? The field has been divided into five strips: in one the wheat has been drilled shallow, ploughed in, and harrowed; in another it was broadcasted, ploughed in, and harrowed; on the third the wheat was drilled on the surface left by the digger, and put in as deeply as the soil allowed, there being no ploughing or other preparation; the fourth was ploughed and then drilled in the usual way; the fifth was ploughed and broadcasted. The first two strips look the best and lay dry through the heavy December rains of 1914: the third has become badly beaten down by the rain, the fineness of the tilth causing the soil to run together very much, a result that was also obtained last year in similar circumstances: the other two are intermediate.

It is proposed to extend these cultivation experiments, for probably less is known about the cultivation processes than about any other branch of soil treatment. Before designing any proper set of experiments, however, it is necessary to know what cultivation does. A series of laboratory experiments is already in hand to study the air, water and temperature relationships of the soil, which are known to be affected by cultivation, and it is hoped to get some information about that remarkably intricate subject, the texture of the soil. When these are more advanced it will become possible to evolve some scheme of tillage experiments to examine such problems as the difference between a "fresh" and "stale" furrow, which are known to be of practical importance, but which have not received the attention they deserve from experimenters, and indeed cannot until they have been more systematically studied.