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Field Plots Committee

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H. V. Garner (1962) *Field Plots Committee ; Report For 1961*, pp 180 - 183 - **DOI:**
<https://doi.org/10.23637/ERADOC-1-94>

break in an intensive arable rotation is not tested in this experiment, as the six arable crops have been chosen so as to minimise the effect of disease in the comparison of rotations.

Information of the kind provided by this experiment is of value where assessing the relative economic advantages of the different systems. The alternative source of such information—surveys and farm costings—can provide reasonable estimates of the major costs for different systems of farming, but corresponding estimates of the relative returns from the different systems are bound to be suspect, because they are based on comparisons between farms and because a particular system tends to be associated with particular types of soil and with other variants of farming practice.

There will soon be further results from the series of ley fertility experiments, which are of a basically similar design to the Rothamsted experiment, on National Agricultural Advisory Service Experimental Husbandry Farms. These experiments include a test of the effect of 6- and 9-year leys.

REFERENCE

BOYD, D. A., CROWTHER, E. M., MOFFATT, J. R. & YATES, F. (1949). *J. R. agric. Soc.*, **110**, 104.

FIELD PLOTS COMMITTEE

by H. V. GARNER

The original Rothamsted experiments consisted almost entirely of "Classicals" which, after a short formative period, almost ran themselves on a fixed annual schedule. A very simple organisation sufficed to keep the system working in field, laboratory and record office. Annual experiments began in a small way during the First World War, and by 1922 the number of annual plots had risen to 239, as compared with 205 classicals. Even at this stage the experimental programme was settled by a few interested people in the Director's room, but as the number and complexity of the experiments increased a more permanent body was needed. This was the beginning of the Field Plots Committee, whose responsibilities have gradually grown till now, with some fifty would-be experimenters and only about 350 acres of potential experimental land, several specialised bodies have been set up to make sure that experiments are statistically and agriculturally sound, that they are sited on suitable land and that both farm staff and experimenters know their respective responsibilities at every stage. Easy communication between the many individuals concerned with the field experiments is very necessary. This job falls on the Secretary of the Committee, whose office is the clearing house for all matters relating to the field experiments. The following notes give an outline of the development of the Committee since it was formed nearly 40 years ago.

In April 1922, at the suggestion of Sir John Russell, the Staff Council set up a sub-committee to consider the best method of making observations on the field experiments and permanently recording them. This body drew up a scheme of observations on insect and fungus attacks, incidence of weeds, habit of crop growth,

and physical and chemical soil characteristics. In due course heads of departments were asked to inform H. V. Garner, who had just been appointed to demonstrate the experiments, about the kind of observations required. So far as can be ascertained, there is no record that these early observations were ever made, but as several thousand visitors saw the fields in the summer months, this is perhaps not surprising. In the following year T. Eden, an ecologist, was appointed and E. J. Maskell was seconded from Imperial College to improve the accuracy of field experiments and make detailed quantitative observations on the plots. On 31 January 1924 a body called the Field Observation Sub-Committee first met. There was no list of members present, but H. J. Page, then head of the Chemistry Department, presided in the Director's absence and T. Eden was Secretary. The main business was to reconsider the original proposals for field observations, and this time the work was split up and assigned to the scientific departments. "It was recognised that H. V. Garner's chief contribution would be the collection of observations from visitors." The next three meetings were devoted almost entirely to observational matters, but at the 5th meeting, held in December 1924, the programme of annual experiments for 1925 was decided. It was also laid down by the Staff Council that departments wanting field experiments should work through the Secretary of the Committee. In the meantime R. A. Fisher had developed his statistical methods, which gave rise to the Latin square and randomised block designs, and the interest of the Committee began to move from observations to applying the new designs and experimental techniques to modern fertiliser problems, and in 1925 this new outlook was expressed by a change of name to the Field Plots Sub-Committee. In a minute dated October 1925 we read: "It was suggested that the question of the design of experiments should be given additional consideration in the light of Mr. Fisher's methods. The Secretary (T. Eden) reported that the Field Experiments department worked in the closest cooperation with Mr. Fisher, to whom all questions of principle were referred." The experiments of 1925 provided the first examples of the new designs to be published in the Station Report.

In 1926 Rothamsted took over the lease of the Woburn Farm from Dr. Voelcker, and arrangements for field experiments there also came under the Committee. In the following year several of the original members took up other posts, including T. Eden, who was replaced as Secretary by A. R. Clapham. Experiments at outside centres, which began in a small way in 1922 and had since been much extended, came under the Committee in 1928. It was in this year that E. M. Crowther joined the Committee and took a leading part in its activities till his death in 1954.

This period is marked by the beginning of three long-period rotation experiments, a four-course testing the residual values of organic and phosphatic fertilisers at Rothamsted and a six-course to study the seasonal action of fertilisers on both farms. These experiments, which lasted 25 and 30 years, respectively, were the first of their kind, and long-period rotation experiments are now part of the furniture of all permanent soil research stations. The minutes of those early meetings give very little indication of what went on

during the gestation of these experiments; there were isolated references to particular matters, but the deliberations which must have taken place before the experiments reached their final form were not recorded. In recent times much more information about decisions on complex experiments is on record in the Committee papers.

In 1930 A. R. Clapham left Rothamsted and D. J. Watson was appointed Secretary. By this time the amount of work passing through the Committee had reached a stage when a system of rules had to be drawn up for presenting proposed experiments to the Committee and the steps necessary to get them on the ground. An executive sub-committee consisting of E. M. Crowther (Chairman), R. A. Fisher, H. J. Miller (the farm manager) and D. J. Watson (Secretary) was appointed in 1931 to look at schemes before they went to the main committee. This body was very active and met about six times a year, with a corresponding decrease in the work of the main Committee; in 1933 F. Yates and J. R. Moffatt were appointed in place of R. A. Fisher and H. J. Miller. This arrangement lasted for 13 years, during which six long-period rotation experiments were started.

At the beginning of the War experiments at outside centres were greatly increased to study problems arising out of fertiliser shortages and substitute materials. This side of the work was taken over by the Chemistry Department to avoid overloading the Field Plots Committee, which already had an elaborate set of field experiments on war-time problems on both farms. Early in the War there was some anxiety about the original records, in view of fire and other risks. In the minutes of 15 July 1941 it is recorded that: "The Director said that arrangements had been made for Kodak's to make micro-photographs of the records of past experiments. One copy would be preserved at Washington and the other at Ottawa." Soon afterwards the risks diminished and this safeguard was not necessary.

At this period it appeared that most of the work was being done by the executive body, and the main committee met only two or three times a year to hear reports and discuss programmes. In 1944 both these bodies were dissolved and a single committee was appointed; it was the former executive committee, with the addition of F. C. Bawden and B. Weston, the field superintendent. It reported to the Staff Council.

There were still several administrative changes before the final form was set up in 1953 with E. M. Crowther (Chairman), F. Yates, H. H. Mann, D. J. Watson, J. R. Moffatt and H. V. Garner (Secretary). This body was made responsible to the Director, instead of to the Staff Council, but its reports were widely circulated. By this time the increase in the numbers and complexity of the experiments had begun to make heavy demands on the members, and meetings were very protracted. It was therefore decided to set up three working parties to prepare material for the main Committee, they were: Classical and Long-Period Experiments—Chairman, F. Yates; Agronomy Experiments—Chairman, E. M. Crowther; Pathology Experiments—Chairman, F. C. Bawden.

The mechanisation of experimental operations in the field and the increasing use of microplots and sampling methods led to the

formation of a Working Party on Field Methods under R. G. Warren. Meanwhile new fungicides, insecticides and weedkillers confronted experimenters with a fresh set of hazards, and a sub-committee on the Use of Noxious Materials was set up under D. J. Watson to advise the Committee. A Planning Group with G. W. Cooke as Chairman was formed to select experimental sites and supervise the manuring of non-experimental land, particularly areas being prepared for future fertiliser experiments. In 1959 G. V. Dyke succeeded H. V. Garner as secretary of the Committee.

A committee is generally an unloved thing, particularly one with some authority and a hand in so many peoples' affairs; but on the whole the scheme which developed at Rothamsted has worked, for in the last 40 years many hundreds of experiments have been laid down, and we still have a usable experimental farm.