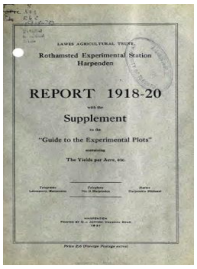
Report 1918-20 With the Supplement to the Guide to the Experimental Plots Containing the Yields per Acre Etc.



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Rothamsted Research

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INTRODUCTION.

The Rothamsted Experimental Station was founded in 1843 by the late Sir J. B. Lawes, with whom was associated Sir J. H. Gilbert for a period of nearly 60 years. Lawes died in 1900 and Gilbert in 1901; they were succeeded by Sir A. D. Hall from 1902 to 1912, when the present Director, Dr. E. J. Russell, was appointed.

For many years the work was maintained entirely at the expense of Sir J. B. Lawes, at first by direct payment, and from 1889 onwards out of an income of £2,400, arising from the endowment fund of £100,000 given by him to the Lawes Agricultural Trust. In 1904 the Society for extending the Rothamsted Experiments was instituted for the purpose of providing funds for expansion. In 1906 Mr. J. F. Mason built the Bacteriological Laboratory; in 1907 the Goldsmiths' Company generously provided a further endowment of £10,000, the income of which is to be devoted to the investigation of the soil, thus raising the total income of the Station to £2,800. In 1911 the Development Commissioners made their first grant to the Station. Since then Government grants have been made annually, and for the year 1919-20 the Ministry of Agriculture made a grant of £9,781 in respect of Plant Nutrition and Soil Problems, and £4,023 in respect of Plant Pathology. Viscount Elveden has generously borne the cost of a chemist for studying farmyard manure since 1913, and until his death the late Mr. W. B. Randall defrayed the salary of a biologist.

The increase in the permanent trained and skilled staff has been considerable. In 1912 there were 9 members of the scientific staff, 3 of the office staff, and 12 assistants; in 1920 the scientific staff consisted of 29 members, in addition to 4 in the office, with 16 of the assistant staff, thus showing an increase of 25 during the years in question.

The laboratory expenditure has grown and almost exactly balances the income, there being only an accumulated deficit which has resulted from refitting after the War.

On the farm, however, the cost of the experimental work has latterly increased so much as to cause grave concern to the Committee. After deducting receipts the figures for net cost are:—

1911-12	£692	1914-15	£595
1912-13	£456	1915-16	£284
1913-14	£509	1916-17	£397

1918-19 - Oct. 1st to 31st March £217

1919-20 - 1½ years to Sept. 30th £1,694

For the season 1920-21 the net cost will be nearly £2,000.

The period reviewed in the present report has completed the reconstruction which began in 1913, and has progressed continuously since. As a necessary preliminary, the laboratories have been entirely rebuilt, and were opened in October, 1919, by Sir Arthur Griffith Boscawen, in the unavoidable absence of Lord Lee, then Minister of Agriculture. A library has been collected and now contains some 15,000 volumes dealing with agriculture and cognate sciences. The equipment of the farm has been completed, cattle sheds erected, a tractor and other machinery added, and cultiva-

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tions and cleanings necessarily neglected during the War have all been completed.

The most important part of the reconstruction has been the reorganising of the work of the Station so as to bring it into touch with modern conditions of agriculture on the one side and of science on the other. The purpose of the Station is to gain precise knowledge of soils, fertilisers, and the growing plant in health and disease, and then to put this knowledge into such a form that experts can use it. The work of the Station falls into two great divisions—the soil and the healthy plant; and the insects, fungi and other agencies disturbing the healthy relationships and causing disease. The two divisions are linked up in many ways, and every effort is made to find fresh relations between them. If farmers are ever to avoid the very serious losses they now suffer from plant diseases and pests, it will be by prevention rather than by cure.

The method adopted is to start from the farm and work to the laboratory, or vice versa. There are four great divisions in the laboratory—the biological, chemical, physical and statistical—which may be regarded as the pillars on which the whole structure rests. But the method of investigation differs from that of an ordinary scientific laboratory where the problem is usually narrowed down so closely that only one factor is concerned. On the farm such narrowing is impossible; many factors may operate and elimination results in conditions so artificial as to render the enquiry meaningless. In place, therefore, of the ordinary single factor method of the scientific laboratory, liberal use is made of statistical methods which allow the investigation of cases where several factors vary simultaneously. Thus in the crop investigations a large number of field observations are made; these are then treated statistically to ascertain the varying degrees to which they are related to other factors—such as rainfall, temperature, etc.—and to indicate the probable nature of the relationships. Thus the complex problem becomes reduced to a number of simpler ones susceptible of laboratory investigation.

It is confidently anticipated that this method will prove effective in bringing the full help of science to bear on the farmers' problems.

REPORT ON THE WORK DONE
DURING 1918, 1919, and 1920.

THE function of the Rothamsted Experimental Station is to gain exact information about soils and the growth of crops in health and disease. This information is indispensable to the teacher, indeed without a basis of precise knowledge no system of agricultural education could possibly stand: it is needed also by the advisory experts and by the expert farmer who wishes to improve on current good practice and secure better results than his predecessors. It is, however, essential that the information gained should be as correct as possible, and consequently every precaution must be taken to guard against wrong results. Wrong information has been responsible for many costly errors in the past: the deep drainage of the 'fifties and 'sixties, the burying of

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