

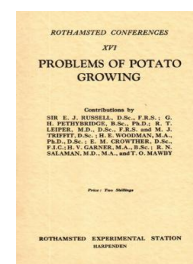
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# Problems of Potato Growing

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## Foreword

**Sir E. J. Russell**

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## FOREWORD

BY SIR JOHN RUSSELL, D.Sc., F.R.S.

FOR many years the potato crop has been one of the most interesting in British agriculture. It has long been associated with high farming, and its growers have survived the stresses and strains of the last few years better than most other intensive farmers. In spite of the fact that our markets were till recently open freely to all the world the potato growers managed to retain practically the whole production for themselves : they have long supplied, or been able to supply, all our requirements, and in addition they have usually exported a certain amount of seed.

This important industry, however, is highly specialised and localised. By far the largest part of the crop is produced in five regions :

- (1) Around the Wash, especially the Holland division of Lincolnshire and the Isle of Ely ;
- (2) In South Lancashire starting from Ormskirk and crossing into North Cheshire with extensions into Staffordshire ;
- (3) In Bedfordshire, especially the region about Sandy and Biggleswade ;
- (4) In the East Riding of Yorkshire, with extensions into the West Riding ;
- (5) In Durham.

Most of the other counties of course produce some potatoes but usually insufficient for their own needs so that there is a considerable movement of potatoes from the centres above mentioned not only to the large towns and cities but even to small towns and villages to make good the local deficiencies.

One of the greatest troubles of potato growers in the past has been to fit the supply to the demand. In some years a deficit has been threatened and then of course importation began. In other years there has been a great excess, prices have been very low and many thousands of tons of potatoes have rotted in the clamps for want of a market. Against this kind of trouble the individual grower fights in vain and science gives no help : organisation is the only way out and that is being tried now for the first time since the Food Production Department of the war years ceased to function.

Organisation not only gives the individual farmer a more definite idea of his economic position : it gives the scientific worker his best chance for applying sound, trustworthy scientific results to practical problems. And so the setting up of the Potato Marketing Board under the able chairmanship of Captain Mollett, himself a good Yorkshire farmer and potato grower, seemed to offer a unique

occasion for discussing the problems of potato growing and summarising and publishing the information thus obtained.

Potato growing is necessarily costly. It is quite unsuited to low farming: you must either grow potatoes well or go out of the business. As the Lincolnshire growers say: "Potatoes like company." You cannot simply put them into the ground and leave them in the hope that they will of themselves yield a good crop. Hence, in any scheme of organisation one must envisage a limited area of high yield rather than widely scattered areas of lower yields.

Economical production therefore becomes imperative, and this necessitates:

- (1) The use of good seed of the most suitable varieties;
- (2) Appropriate schemes of manuring and cultivation;
- (3) Control of insect and fungus pests and of other agencies causing disease;
- (4) The working out of some method for dealing with excess produce in bountiful years.

All these problems are discussed by leading authorities in the following pages. The control of disease is now known to be effected much more economically by the use of resistant varieties than by any curative treatment. The method has already proved effective for the control of Wart disease; the serious damage this threatened to the industry has been happily averted. The work is not yet complete: it is still necessary to find a good immune First Early and a satisfactory immune substitute for King Edward. This, however, is only a matter of time, and the search has been considerably shortened by Miss Glynne's discovery of a method whereby new seedling varieties can be sorted out rapidly into immunes and non-immunes so avoiding the prolonged field trials previously necessary.

A serious attempt is now being made to find varieties immune to the common Blight. This presents some difficult problems. The Blight fungus, *Phytophthora infestans* appears to exist in several biological strains, and because a variety of potato is immune to one strain it is not necessarily immune to others. However, a beginning has already been made by Dr. Salaman and good results may yet emerge.

Dr. Pethybridge describes the methods for dealing with the more common diseases so far as this is practicable.

The eelworm *Heterodera schachtii* has already caused a great deal of trouble and may yet cause more. Dr. Leiper discusses the present position, and shows that the particular variety infesting the potato is rather different from its closely allied relative that does so much damage to sugar beet on the Continent. In particular it only hatches out from its cysts under the influence of secretions from the root of the potato and of a few other plants, while the sugar beet variety hatches out more easily. Further, the potato eelworm can live for a long while in the soil. For both these reasons rotation is not a com-

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plete cure for eelworm but it mitigates the losses, and the present work suggests that the introduction of a temporary ley into the rotation still further reduces them.

When one remembers that Wart disease became a serious pest only a few years before the War, that the eelworm trouble has been serious only since the War, and the Virus diseases even later, we are bound to recognise that Nature probably has in store a good deal more in the way of troubles and trials for the potato grower. Shall we succeed in keeping out the Colorado beetle, that undesirable alien that persistently tries to land at Tilbury? Is some new and destructive virus disease being compounded that will do heavy damage to crops in the future? We do not know, but we may be quite certain that the problems of plant disease, like those of human disease, are without end, and that adequate research and a pathological service will always be needed.

No less important is the problem of finding suitable manurial and cultivation schemes for obtaining the most economical yields. This problem is always shifting with each change in the economic positions of the grower and of the fertiliser manufacturer, and as the growth of the crop becomes more localised and more intensive so the need for working out the most effective fertiliser recipes becomes more imperative. Dr. Crowther and Mr. Garner show how great is the difference in response to fertilisers on the different soil types: the black soils behave quite differently from the mineral loams. It is impossible to give one formula that suits all soils, and reduction in amount of one constituent may lead to serious losses on one soil, and to a saving of money on another. The new methods of field experiments devised at Rothamsted for use on commercial farms give valuable material for the working out of methods of soil analysis which, we hope, will lighten this problem of choosing the right mixture. At present soil analysis is not a trustworthy guide to manuring though with fuller information such as is now accumulating we hope to make it so.

The reader is entitled to ask why no paper on Quality of Potatoes was included. The reason is that we know so little about the subject. Quality in any crop is difficult to define, but quality in potatoes is particularly elusive. So much turns on the use to which the potato is to be put and on the individual fancy of the buyer that the scientific worker can get hold of very little. Our experiments are summarised in the paper by Dr. Crowther and Mr. Garner: the subject is being closely watched and anything likely to prove useful will be followed up.

Any crop produced in amounts sufficient to satisfy the annual needs of the country is bound in some seasons to yield far more than is wanted. One of the best safeguards against the losses arising from unusual bountifulness of Nature is to provide a satisfactory outlet for this excess production. Farmers who have much livestock can utilise a considerable quantity of potatoes in feeding, subject to

the conditions set out in Dr. Woodman's paper. Diseased or sprouted potatoes, for example, are liable to be dangerous. Roughly speaking 1 ton of potatoes is the equivalent of 2 tons of roots or of 5 cwts. of maize and in addition it supplies considerable quantities of the antiscorbutic vitamin so necessary to the animal during the winter period.

One of the difficulties of utilising excess potatoes on the farm is that the farmer who has livestock is very liable to have abundance of other home-grown foods in the year when he obtains excess of potatoes. Moreover, many potato growers have insufficient livestock to consume all their excess production.

In view of these difficulties it has often been suggested that factories should be set up for the manufacture of Power alcohol, farina, or other products from excess potatoes. Considerable enquiry has already been made and the economics of several of the processes have been investigated. One point, however, clearly emerges: factories cannot be put up on the off chance that material may be sent to them if it cannot be sold elsewhere. Factories need regular supplies of their raw materials, and before they could be erected farmers would need to enter into contracts to supply definite amounts of potatoes *each year, whatever the market price*. The potato factory, in short, would need the same kind of safeguard as the sugar beet factories. Once established they could deal with any glut of potatoes, however heavy, and in years of great abundance they would prove a useful economic buttress to the industry.

The following pages show that the problems of potato growing are likely to become more definite but no less serious as time goes on. The present research and advisory system is very effective for dealing with most of them, but it would gain greatly in value by the establishment of a special Potato Research Station in one of the important potato growing districts. The existing testing and demonstration stations serve a useful purpose and a Research Station in touch with these and with the large Research Institutes of the country would complete the scheme and undoubtedly prove of great value.