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Report for 1948

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REPORT
for
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Woburn Experimental Station

H. H. Mann

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WOBURN EXPERIMENTAL STATION

By H. H. Mann

Season

The season of 1947–48 was a very wet one, the rainfall being higher than for several years. It amounted to 28·36 inches for 1948 and early in August we received the biggest amount of rain in a single day that has occurred for over twenty years (2·38 inches). The summer of 1948 was, in fact, a great contrast to that of 1947 when there was an almost complete drought during the growing season. The weather was also cold during the summer months, and very wet at harvest. These facts made the harvest, particularly of those crops which ripen in the autumn, very difficult.

Field Experiments

Wild oats are a serious pest on the permanent barley plots in Stackyard field. The long continued growth of barley on the same land had led to an extremely bad infestation of the area and to the necessity of fallowing the ground for long enough to get rid of the pest. Even after a year of fallowing and intensive cultivation, there were, in February 1948, nearly 4½ million growing wild oat plants per acre in spite of continued scuffling and harrowing, there were again 3½ million plants in April, and 2½ million in June. Hardly any further wild oats germinated for the rest of the year, but in March 1949, after nearly 2½ years of fallow, 32,000 living wild oat plants per acre were again found. It is clear that once an area becomes infested with this pest, it needs a period of over two years of intensive cultivation before the area can be cleared.

There was a very serious extension of the attacks of fleabeetle on certain crops in 1948. Up till recently this pest was considered as a specific enemy of Brassica crops, and a real danger only in a dry season. In the last year or two, however, and particularly in 1948, it has done serious damage not only to Brassica but also to lucerne and to linseed. In spite of measures against it with D.D.T. and other insecticides, one experimental crop of lucerne was lost in 1948 and had to be resown, and the effect on late planted linseed was very serious. In this matter other people in the Woburn neighbourhood suffered equally with ourselves.

One of the matters which have for a number of years been a feature of the Woburn station has been the growing of certain exotic crops which seem to have possibilities in this country especially on the well drained, but semi-acid, soil which is characteristic of the station. The crops of this kind grown in 1948 have been hybrid maize from the United States, sweet lupins for forage, soya beans, and the well known continental forage crop, serradella. The weather of 1948 was not at all suitable for these crops, all of which usually grow in conditions where the summer is very much warmer than is the case in England, for the year under report had a cold, wet summer, and also a wet autumn at the time when most of these crops normally ripen. With regard to maize, however,

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where we grew several of the early Wisconsin hybrids (seed of which was kindly supplied by Dr. Neal of that State), it was possible to ripen several of the types supplied, though they required from 170 to 180 days from the date of sowing as against 80 days or thereabouts in America. The yield obtained was much greater than it has been possible to obtain from other early types, and the best yielded 27·5 cwt. of dry grain per acre, a yield which makes the growing of such hybrids for grain quite a possibility in this country. The ordinary hybrid types grown in the U.S.A. proved themselves far too late in a summer like that of 1948 to be of any use for grain production, though they furnished excellent cobs for use as a vegetable and would be a most valuable silage crop.

Another crop which we have been testing for several years is sweet lupins considered as a forage crop. This was evolved originally in Germany, but it has been further developed by Mr. Oldershaw of Ipswich. The special virtue of sweet lupins as a forage crop is that they grow on very sandy land which is distinctly acid—conditions which are not favourable to most forage crops. All the types grown in 1948, except the blue variety, grew well on the Woburn semi-acid land and gave very large yields of fodder, being as great as 30 to 40 tons of green material per acre after two to three months of growth. The fodder was eaten by cattle though not with much relish, and it seems that in these varieties we have a source of forage on land which will not produce the more normal kinds. The blue types of lupin were a failure, being almost entirely wiped out by a wilt (*Fusarium avenaceum*), which was identified at the Government Plant Pathology Laboratory.

As regards soya beans, we have again grown the early dwarf type, Manitoba Brown, which ripened normally but yields so poorly that it cannot be the basis of an industry. The more normal types grown commonly in the United States will not ripen in this country, especially in a cold, wet summer as in 1948, and, in fact, a small area of the 'Lincoln' variety never even formed pods, though it grew well up to the point of flowering.

We have also made preliminary experiments with serradella as a fodder crop, suited for such land as that at Woburn, and though it grew well the yield of fodder was very small compared with what I have seen in warmer regions on soil otherwise not very dissimilar. This will be again tested under summer conditions with, it is hoped, a more normal temperature.

Pot Experiments

Clover Sickness

The study of this obscure affection of clover has continued and we can record distinct progress in elucidating the nature of the disease. It is now clear that the speed of onset of the affection depends on the actual amount of clover which has grown in the soil, and by increasing the proportion of clover to soil the rapidity with which the soil becomes sick can be greatly increased. Further the partial sterilization of the soil by toluene or even by formalin does little to get rid of the disease in a badly affected soil, and even the oxidation of the more reactive organic materials in the soil has little effect.

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Competition of crop plants with certain weeds

After a series of years in which we have studied the competition of barley and certain weeds, including two types of twitch and three of the commoner annual weeds, we have in 1948 widened the scope of the investigation to include the effect of clover as a competitor with barley when they are grown together. The results which are now being worked up promise to be of considerable interest in view of the fat that clover is so commonly grown with barley in ordinary farm practice.

The nutrition of crops under very acid soil conditions

For a number of years an investigation has been in progress to find out why barley will not grow under conditions more acid than that represented by a pH value of 4·7 to 5·0. The particular phase of the study in 1948 has been to ascertain how far the addition of calcium can be effective when given in such a form that the acidity of the soil was not or little affected, any soluble aluminium being at the same time precipitated. In no case was the addition, even of a fairly large quantity of such calcium, effective, unless the acidity of the soil was also reduced. The relative parts which acidity as such, the presence of soluble aluminium, and the absence of calcium in an assimilable form take in preventing the growth of barley on an acid soil have been the subject of an enormous amount of research, particularly in America, but the matter is still not completely elucidated, and the present investigations are taking advantage of some extremely acid soils at Woburn to make further efforts to clear up the question.

LABORATORY WORK

The main work of the laboratory at Woburn is to enable us to follow the behaviour of the crops which are being grown in the field experiments and the changes in the soil on which they are grown. This requires the attention of almost the whole time of Mr. Barnes and the laboratory staff. But we have this year continued the examination of the very large number of soil samples which have been obtained from the field at various stages of the long term experiments. The main study at present is that of the sulphur in various forms in the soils from the permanent barley experiments. I had hoped to give a fuller account of the results so far obtained in this study, but this must, I think, wait for the further work being done in 1949.

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