

Uptake of Soil and Fertilizer Phosphorus by nine varieties of wheat
and nine varieties of barley.

F.G. Warder

Abstract

Barley is frequently considered to be more responsive than is wheat to phosphatic fertilizer applied to prairie soils which are deficient in available phosphorus. An opinion has also been expressed that there is a differential response between varieties, particularly of barley.

Nine varieties of wheat and nine of barley of different parental lines were selected. Ten replicates of each were seeded in a silt loam soil which was known to respond to phosphate application. These were grown in an environmentally controlled room. Each pot received adequate nitrogen. Two replicates received no phosphate. Monoammonium phosphate tagged with P_{32} was applied to the remaining 8 replicates.

The two non-phosphate treated replicates and 4 replicates containing the phosphate treatment were harvested at the heading stage. Dry matter production was greatly increased for each variety by the phosphate and in most varieties the percentage phosphorus in the tissue was also increased. There was no difference in the "A" values, either between crops or between varieties within each crop.

The remaining 4 replicates were harvested at maturity. There were considerable differences in the yield of grain and straw between varieties and also considerable differences in the absorption of soil and fertilizer phosphorus. Although "A" values were slightly higher than at the heading stage no differences were found between crops nor between varieties.

It is concluded that the differential response which has been observed between barley and wheat, and between varieties was not due to physiological differences in the specific absorption of phosphorus. It is more probably due to the interaction of climatic and soil factors which affects the morphological development.