THE EFFECT OF FERTILIZER ON THE LENGTH OF WINTER WHEAT HEADS

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A SURVEY of the results from several experiment stations reveals the fact that wheat is more responsive than most other farm crops to applications of commercial fertilizer. The reasons for this have been set forth by agronomists in various sections of the country. Thatcher (8) found that phosphorus and potassium increased the test weight per bushel and that nitrogen applied in combination with the other elements caused a further increase, but that nitrogen alone or in combination with either phosphorus or potassium caused a decrease in test weight. Bayfield (1) likewise obtained an increase in test weight per bushel as a result of fertilizer application. Millar (4) reported that phosphoric acid fertilizers resulted in plumper kernels of a higher market value.

Winter wheat yields are often depressed by serious winter injury. The fact that fertilizer, properly used, is effective in preventing winter killing of wheat has been observed by Grantham and Millar (3) and by Cook and Millar (2).

Thatcher (8) found that sodium nitrate applied early in the spring increased the number of tillers per plant. Richardson and Fricke (6) found that nitrogen increased the number of head-bearing tillers and also the number of heads per plant at harvest time. On seven experimental fields in central Kansas, Parsons (5) found that nitrogen neither increased the number of heads nor the yields, but that superphosphate fertilizer resulted in greater yields and that the difference in yield was almost all accounted for by the increase in tillering. He reported a slight tendency toward larger heads, especially on one field of inferior soil.

It is commonly believed that increased length of head is a source of greater yields of wheat due to fertilizer application. Grantham and Millar (3) working on sandy soils found the heads of fertilized wheat to be longer than those of unfertilized wheat. Richardson and Gurney (7) showed that ammonium sulfate resulted in vigorous tillering and slightly longer heads.

It is the purpose of this paper to show the effect of fertilizers on the length of wheat heads grown on three silt loam soils during a period of three years and to show how many heads constitute a sample representative of the entire population. A comparison of statistical methods is also included.

SOURCE OF HEADS MEASURED

The heads used in the 1935 measurements were obtained from the Perden experimental field in Saginaw County. The wheat was grown...