THE INFLUENCE OF RATE OF SEEDING UPON CERTAIN PLANT CHARACTERS IN BARLEY

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According to results secured by other investigators, the rate of seeding small grains has relatively little influence on yield but may materially influence the expression of certain plant characters such as tillering, number of heads per plant, length of head, etc. The purpose of the present study was to determine the differential response of certain barley varieties to different rates of seeding as indicated by variations in tillering, length of culm, length of head, number of kernels per head, weight of 1,000 kernels, weight of grain from 100 heads, and yield per acre.

MATERIALS AND METHODS

The varieties, chosen for these trials because they possess marked differences in the plant characters studied, included two two-rowed and two six-rowed barleys. Of the two-rowed barleys used, Spartan is a smooth-awned, early maturing variety and Michigan-Two-Row, a Hanna selection, is rough-awned and late in maturity. The six-rowed types were Glabron, smooth-awned and medium in maturity, and Wisconsin No. 38, a late-maturing barley also with smooth awns.

Planting was made with a 7-inch, 11-disc grain drill calibrated each year with each variety for each seeding rate. Four replications of each variety were planted in plats five drill-rows wide and 50 feet long, the seeding rates for each series of replications being \( \frac{1}{4} \), 1, 1\( \frac{1}{2} \), 2, 2\( \frac{1}{2} \), and 3 bushels per acre. Every fifth plat was drilled at 1 bushel per acre to Spartan for the purpose of observation and for calculating yields.

As soon as the grain was well up, sections were marked off in the center row of each plat beginning 5 feet from the ends. These sectional rows were 10 feet long in the plats seeded at the \( \frac{1}{4} \) and 1 bushel rates, 5 feet long when rates were 1\( \frac{1}{2} \) and 2 bushels, and 2\( \frac{1}{2} \) feet long where seeding rates were 2\( \frac{1}{2} \) and 3 bushels. Before tillering commenced, the number of plants in each of the marked sections was determined. These representative areas also furnished the material for all the plant determinations made later. Yield and other data likewise came from the center row of the five-row plats to eliminate the influence of varietal competition.

Enough plants were selected at random from each sample to give about 30 culm and head measurements when all developed culms and heads on a plant were used. A developed culm was any stem bearing a head with matured grain. Data were also recorded as to the number of plants per unit area and their respective numbers of developed and undeveloped culms. An undeveloped culm was taken as any stem or tiller over 15 cm long not bearing a head with mature grain, those less than 15 cm long being disregarded.

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