EFFECT OF ROW SPACING ON THE YIELD OF SMALL GRAIN NURSE CROPS

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WHEN small grain is drilled in rows 7 or 8 inches apart as a nurse crop for sweetclover, legume seedlings are usually too small to survive periods of hot, dry weather that commonly occur as the small grain approaches maturity or immediately following harvest in the sub-humid portion of the southern Great Plains region. Rainfall declines from east to west in this area; consequently, sweetclover production will be limited by available moisture and drought hazards during many seasons.

If the space between drill rows of small grain could be increased to provide a more favorable condition for the growth of legume seedlings without seriously reducing farm income, it would aid materially in the development of legume rotations on many soils to replace nitrogen which has been removed as a result of the continued production of soil-depleting crops.

REVIEW OF LITERATURE

The effect of row spacing on the yield of small grain has been studied by several investigators to determine the relative merits of seeding equipment under varying soil and climatic conditions (1). Kiesselbäch, Anderson, and Lyness (2) found that lower yields of wheat were obtained in 14-inch rows as compared with 7-inch rows over a 3-year period when the same quantity of seed was used. Similar results were obtained by Thatcher and Lewis (7).

Salmon (5) planted wheat in rows varying from 8 to 16 inches apart at the rate of 3, 4, and 6 pecks per acre. Very little variation in yield occurred from different spacings or rates of planting over a 4-year period.

McClelland (3, 4) studied the effect of border rows on the yield of spring oats. Border rows 16 inches apart produced 25.8% more grain than inside rows 8 inches apart. When the alley was 24 inches wide, border rows produced 43.7% increase in yield over the inside rows. A larger growth of red clover occurred in the alleys because the border rows did not make full use of the alley space.

Wiebe (9) found that the average yield of wheat varied 3.8% for each inch a row was mis-spaced over a range of 7 to 17 inches.

Sprague and Farris (6) reported that the rate of planting could vary as much as 40% without reducing the yield of barley when rows were 8 inches apart. Barley roots tend to grow downward with a limited lateral spread. Wheat, oats, and rye have a more extensive root system than barley and a wider fluctuation in seeding rate could occur without affecting the yield.

Experiments conducted at Lawton, Okla., on medium-textured soils with slowly permeable subsoils and at Woodward, Okla., on coarse-textured soils with permeable subsoils indicate that young sweetclover plants in rows 7 inches apart compete with each other for soil moisture to such an extent that they are frequently killed by hot, dry weather in July and August. Reducing the number of plants per unit area by spacing the rows 36 to 42 inches apart has increased survival when competition from other vegetation is controlled by cultivation.

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3Figures in parenthesis refer to "Literature Cited", p. 794.
4Unpublished data from W. M. Osborn, U. S. Field Station, Lawton, Okla., and M. A. Bell, U. S. Field Station, Woodward, Okla.

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