Effect of Wide Spaced Corn Rows on Corn Yields and Forage Establishment

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The possibility of establishing forage crops in “wide-row” corn has created considerable interest in Iowa. Some farmers see such a practice as a way to eliminate the relatively low-profit oat crop and still get grass-legume crops seeded for hay or pasture. Others see a possibility of using this practice to establish cover crops and thereby grow corn more frequently in the rotation. The cover crop would help prevent erosion and also provide extra organic matter to plow under.

Studies with corn planted in wide spaced rows have not been conducted in Iowa prior to the work presented in this report. However, some earlier work has a relationship to this technique. For example, forages were seeded as cover crops in normal 40- or 42-inch corn rows in many different locations in the state during a 15-year period. Results showed that successful stands were obtained in less than 3 out of 5 years. In many of the years when stands were good, the amount of growth was very limited and provided little in the way of erosion protection or green manure.

Some row spacing studies with corn (1, 2) have been conducted in Iowa. However, the widest spacings were only 42 inches. The results showed that small yield increases were obtained from rows closer than normal, but that in general 40- or 42-inch rows were about right for efficient corn production.

Reports from other states on “wide-row” corn studies are also very limited. Stringfield and Thatcher (4) have reported work in Ohio. They showed that under good fertility and seasonal conditions corn yields held up well even when corn rows were widened from 40 to 80 inches. They also obtained successful stands of wheat, ryegrass, and alfalfa in corn rows 60 to 80 inches apart.

The studies here reported were conducted to test, under Iowa conditions, the feasibility of establishing forage crops in corn planted in wide rows and to determine the effect of row widths on corn yields.

METHODS

1952 Experiments

Preliminary “wide-row” corn plantings were made in 1952 at Castana on Ida silt loam soil and at Independence on a Carrington soil. Plots were large and were randomized and replicated 4 times. The soil was well fertilized according to soil tests. At both locations the treatments consisted of corn grown in rows spaced alternately 40 and 80 inches and corn grown in normal 40-inch rows. The planting rate for corn was adjusted to give the same planting rate per acre in each row system.

The experimental results (table 2). Corn yields were obtained from each plot, and observations on the forage seedings were made several times during the summer and fall.

1953 Experiments

Studies were expanded in 1953, and were conducted at a number of locations. The test plots varied in size but were 100 feet wide and 80 feet long. A randomized block design with four replications was used. The corn row widths used in the experiment and the forage interplantings are given with the experimental results (table 1 and 2).

All plots in 1953 were located on silt loam soils sufficiently to produce high corn yields. Row fertilizer and additional side-dressing were used on all plots at equal rates in addition to row fertilizer, 400 pounds per acre of 20-10-10 plowed down on the low fertility soil at Independence.

The corn was planted with a corn planter equipped with small furrow openers at Independence and Beaconsfield, with a cover planter at Castana and Shenandoah, and with a corn planter at Marcus. In all cases the planter was set to plant 16,000 seeds per acre in both 40-inch rows and in 80-inch rows. In the 80-inch rows, 12,000 seeds were used per planting rate.

At all locations the corn was rotary hoed once or twice. The forage seedings were made just after the corn, which was about June 25. The seed was machine-broadcast and then lightly covered in the 8-inch spaces by rolling by towing a 1½-inch log chain behind the seeder. This was accomplished in the 40-inch rows.

At most locations a mower was used to clip wide spaced rows in August or early September.

1954 Experiments

Three experiments were conducted during 1954 to study the yields and forage interplantings in variable spaced corn. Corn row spacing, date of forage seeding, and forage species are given with experimental results (tables 1 and 2).

At Beaconsfield and Independence the corn was planted with small furrow openers. A conventional grain drill was used at Seymour. The planters were set to plant 16,000 kernels in 40-inch rows and 12,000 in the 80-inch rows. In cases heavy rates of complete fertilizer were applied, corn yields and successful forage establishment varied. The corn was rotary hoed and cultivated 3 times at all locations.

The forage seed was applied through the “grain” of a grain drill. After seeding, the soil was rolled and was planted with the tractor in 40-inch rows. Forage observations were made and were obtained as in the other years.

An additional experiment was conducted at Seymour in 1954 to compare dates of seeding forages in 80-inch corn. The corn for this test was drilled, using small furrow openers, at a rate of about 12,000 kernels per acre. The soybeans were adequately fertilized to give high yields, and an additional 0-20-20 was drilled in 7-inch bands and over the entire soil surface at corn planting time.