

CORN RESPONSE TO TWIN AND NARROW ROWS WITH SELECTED SEEDING RATES

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ABSTRACT: Two studies (twin and narrow row) in 2001 were conducted at Verona, Mississippi, on a Catalpa silty clay loam soil evaluating seeding rates in selected row spacings and seeding rate combinations. These were compared to the standard 30- or 38-inch rows at 28,000 seed/ac. In the twin row (two 9.5-inch rows on 38-inch row center) study seeding rates ranged from 28,000 to 56,000. There was no yield and ear size difference between the twin row seeding rate treatments and the 38-inch row. In the narrow row (15- and 19-inch) study, the 15-inch row at 28,000 seed/ac treatment yield was 149 bu/ac, 12% more than the 30-inch row, but was not significantly different from all the other treatments. The 15-inch row with 28,000 seed/ac also had 6.25% more ears than 30 inch row with 28,000 seed/ac. At 33,000 seed/ac, the 15-inch row had 8% higher yield than 19 inch row. In 2000 with 28,000 seed/ac, the 15-inch row yield was only 3% more than 30 inch rows.

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MATERIALS AND METHODS: Two studies were conducted on a Catalpa silty clay loam soil at Verona, Mississippi. The twin row study evaluated 2 rows (9.5 inches apart) on 38-inch row centers with seeding rates of 28,000, 34,700, 42,000, and 56,000 seed/ac (Table 1). These treatments were compared to 38-inch rows with a seeding rate of 28,000 seed/ac. The narrow row study was conducted evaluating selected seeding rates in combinations with 15- and 19-inch rows compared with 30- and 38-inch rows at 28,000 seed/ac (Table 2). Both studies were conducted as a randomized complete block with 4 replications. Plot size for both studies was 13 ft x 30 ft long. Fertilizers (P and K) were applied based on soil test recommendations. The soil test P level was high and K was medium. Potash (K₂O) at 200 lb/ac was applied broadcast to the soil surface 10/04/00.

Both studies were subsoiled 11/22/00 and disked 12/11/00. The plots were smoothed with a field cultivator on 3/26/01. The twin row and the narrow row studies were both planted 4/02/01. Gramoxone (paraquat) + surfactant at 0.47 lb ai/ac + 0.5 pt/ac was applied preemergence 4/02/01 to both studies. Atrazine + crop oil at 2.0 lb ai/ac + 2 pt/ac was applied postemergence to both studies when corn was 4 to 6 leaves on 5/01/01. Ammonium nitrate at 548 lb/ac (186 lb N/ac) was applied broadcast on both studies on 5/01/01.

Plant population, 50% tassel date, black layer, and grain yield data were recorded for both studies. The corn in both studies was hand harvested and grouped according to ear length (< 4, 4 to 6, and > 6 inches) and then all ears were combined and threshed with a plot combine for grain yield. Plot seed moisture was determined with a Dickey John[®] GAC II grain analyzer. Yields were adjusted to 15% seed moisture. All data were analyzed statistically and means were separated using Fisher's Protected LSD at the 5% probability level.

RESULTS AND DISCUSSION: Rainfall distribution was highly variable with April and June rainfall at 83 and 163% of normal, respectively. Rainfall for May, June, and July was 114, 163, and 47% of normal, respectively. Thus, corn yield was above average. There was no difference in yield between all twin-row treatments and the standard 38-inch row with 28,000 seed/ac in 2001 (Table 1) and 2000 (Table 3). The narrow row (15 and 19-inch) study indicated the 15-inch 28,000 seed/ac treatment yield was 149 bu/ac, 12% more than 30-inch row but was not different from the other treatments (Table 2). The 15-inch row also had 8% higher yield than 19-inch row at 33,000 seed/ac. The 15-inch row with 28,000 seed also had 6.25% more total ears/ac than 30-inch row at 28,000 seed/ac. This research will be continued to determine if results are similar across years. In 2000, at 28,000 seed/ac yield was only 3% more for 15 than the 30-inch (Table 4).

Table 1. Twin row corn response to seeding rates on a Catalpa silty clay soil in 2001, Verona, MS.

| Row spacing (inch) | Seed/ac X 1000 | Tassel | Days to blk layer | Ear size | | | Yield bu/ac |
|-----------------------|-------------------|--------|----------------------|--|------------|----------|----------------|
| | | | | < 4 inch ----- number of ears/plot ² ----- | 4 - 6 inch | > 6 inch | |
| 9.5 twin ¹ | 34.7 | 73 | 124 | 2.06 | 6.13 | 10.89 | 113 |
| 9.5 twin | 42.0 | 74 | 124 | 2.01 | 8.25 | 9.52 | 122 |
| 9.5 twin | 56.0 | 74 | 123 | 1.38 | 11.52 | 10.78 | 129 |
| 9.5 twin | 28.0 | 73 | 124 | 1.26 | 6.88 | 10.43 | 111 |
| 38 std | 28.0 | 74 | 122 | 2.35 | 9.17 | 8.83 | 133 |
| Grand Mean | | 74 | 123 | 1.81 | 8.39 | 10.09 | 122 |
| LSD (0.05) | | NS | NS | NS | NS | NS | NS |
| CV % | | 2 | 1 | 31 | 30 | 15 | 12 |

¹Two rows 9.5 inches apart centered over 38 inch wide rows.

²Number of ears in 2 rows x 30 ft.

Table 2. Corn response to row spacing and seeding rates on a Catalpa silty clay soil in 2001, Verona, MS.

| Row spacing (inch) | Seed/ac x 1000 | Days to Tassel | Ear length | | | Total ear/ac x 1000 | Yield bu/ac |
|-----------------------|-------------------|-------------------|--|------------|----------|---------------------------|----------------|
| | | | < 4 inch -----number of ears/ac x 1000----- | 4 – 6 inch | > 6 inch | | |
| 15 | 24.8 | 75 | 1.60 | 8.42 | 13.36 | 23.38 | 143 |
| 15 | 28.0 | 75 | 2.03 | 12.05 | 12.49 | 26.51 | 149 |
| 15 | 33.0 | 76 | 5.08 | 12.63 | 10.31 | 28.02 | 144 |
| 19 | 24.8 | 74 | 2.75 | 11.81 | 10.66 | 25.22 | 138 |
| 30 | 28.0 | 74 | 2.68 | 11.69 | 10.09 | 24.46 | 129 |
| 19 | 33.0 | 77 | 2.18 | 18.11 | 7.91 | 28.20 | 133 |
| 19 | 16.5 | 75 | 1.60 | 8.25 | 11.12 | 20.97 | 121 |
| 38 | 28.0 | 74 | 2.63 | 10.09 | 10.43 | 23.15 | 136 |
| Grand mean | | 75 | 2.57 | 11.63 | 10.80 | 25.0 | 137 |
| LSD (0.05) | | 2 | 1.57 | 3.08 | 2.95 | 3.1 | NS |
| CV % | | 2 | 41.55 | 18.03 | 18.59 | 8 | 9 |

Table 3. Twin row corn response to seeding rates on a Catalpa silty clay soil in 2000, Verona, MS.

| Row spacing (inch) | Seed/ac | Days to Tassel | Ear size | | | Yield bu/ac |
|-----------------------|---------|-------------------|--|------------|----------|----------------|
| | | | < 4 inch ----- number of ears/plot ² ----- | 4 - 6 inch | > 6 inch | |
| 9.5 twin ¹ | 34,700 | 67 | 17 | 27 | 17 | 118.4 |
| 9.5 twin | 42,000 | 67 | 30 | 31 | 11 | 129.9 |
| 9.5 twin | 56,000 | 67 | 34 | 24 | 12 | 117.0 |
| 9.5 twin | 28,000 | 67 | 16 | 28 | 19 | 134.3 |
| 38 std | 28,000 | 67 | 6 | 21 | 29 | 145.8 |
| Grand Mean | | 67 | 21 | 26 | 18 | 129.1 |
| LSD (0.05) | | NS | 19 | NS | NS | NS |
| CV % | | 8 | 59 | 30 | 49 | 11.5 |

¹Two rows 9.5 inches apart centered over 38 inch wide rows.

²Number of ears in 2 rows x 30 ft.

Table 4. Corn response to row spacing and seeding rates on a Catalpa silty clay soil in 2000, Verona, MS.

| Row spacing (inch) | Seed/ac | Ear length | | | Yield |
|-----------------------|---------|--|------------|----------|-----------------|
| | | < 4 inch | 4 – 6 inch | > 6 inch | |
| | | ----- number of ears/plot ¹ ----- | | | ---- Bu/ac ---- |
| 15 | 33,000 | 9 | 24 | 15 | 136.2 |
| 15 | 28,000 | 7 | 21 | 17 | 133.7 |
| 19 | 24,750 | 5 | 17 | 27 | 130.2 |
| 30 | 28,000 | 5 | 20 | 17 | 129.9 |
| 19 | 33,000 | 16 | 35 | 13 | 127.3 |
| 15 | 24,750 | 4 | 12 | 23 | 126.7 |
| 19 | 16,500 | 2 | 4 | 31 | 123.4 |
| 38 | 28,000 | 11 | 28 | 15 | 123.2 |
| Grand mean | | 7 | 20 | 20 | 128.8 |
| LSD (0.05) | | 3 | 7 | 6 | 12.9 |
| CV % | | 42 | 23 | 20 | 6.8 |

¹Number of corn ears in 2 rows x 30 ft.