

**Corn performance with tillage systems and fertilizer placement, Carrington, 2010.**

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A field study was conducted at the NDSU Carrington Research Extension Center to examine the performance of corn under several tillage systems and fertilizer placement methods. Experimental design was a randomized complete block with four replications. The previous crop was wheat and fall standing stubble was 8- to 12-inches tall. The dryland trial was established on a Fram-Wyard loam soil with 3.6% organic matter, 7.6 pH, and phosphorus at 10 ppm (med). Conventional-till plots were roto-tilled at a 3-inch depth on November 5, 2009, tilled on April 27, 2010 using a cultivator plus spring harrow, and cultivated between crop rows on June 23. Fall strip-till treatments were imposed on November 9 using a Yetter strip-till opener with 30-inch row spacing using a 5- to 6-inch tillage depth that established a berm 10-inches wide. DeKalb 'DK33-53' Roundup Ready corn was planted at a targeted rate of 30,000 seeds/A with a John Deere 71 4-row flex planter in 30-inch rows on May 4. 10-34-0 was applied at 6 gal/A either in the fall or during planting. Adequate levels of N and Zn were applied to the trial during the growing season. Weed control was excellent throughout the season. Soil moisture and temperature were measured in the three tillage systems (data not shown). Plant stand counts were taken on June 3. Seed was harvested with a plot combine on October 13.

Crop residue levels taken after corn planting using the line-transect method were 93% with no-till (direct seed), 66-81% with strip till, and 44% with conventional till (Table). Plant emergence and stands were similar among tillage systems and fertilizer placement methods. However, among strip-till treatments, in-furrow fertilizer tended to have lower plant density compared to other methods of applying fertilizer. Silk dates were slightly delayed (1-2 days) with no-till and strip till without starter fertilizer compared to other treatments. Grain yield and quality generally were similar among treatments. However, among strip-till treatments, seed yield tended to be higher with fall deep band followed by spring in-furrow fertilizer compared to other fertilizer treatments.

| Table.  |              |           |       |       |       |             |          |         |        |
|---|--------------|-----------|-------|-------|-------|-------------|----------|---------|--------|
| Tillage system/ fertilizer placement <sup>1</sup>   | Crop residue | Plant     |       |       | Seed  |             |          |         |        |
|   |              | Emergence | Stand | Silk  | Yield | Test weight | Moisture | Protein | Starch |
|   |              | %         | Jday  | plt/A | Jday  | lb/A        | lb/bu    | %       |        |
| Conventional/2x2-inch band                          | 44           | 144       | 29881 | 207   | 163.8 | 55.7        | 17.0     | 8.6     | 70.7   |
| No-till (direct seed)/2x2-inch band                 | 93           | 144       | 30213 | 209   | 171.6 | 55.8        | 16.9     | 8.7     | 70.8   |
| Strip till/2x2-inch band                            | 81           | 144       | 30877 | 208   | 166.7 | 55.5        | 16.9     | 8.8     | 69.7   |
| Strip till/in-furrow                                | 81           | 144       | 28885 | 208   | 162.6 | 55.3        | 17.3     | 8.7     | 70.9   |
| Strip till/fall deep band                           | 66           | 144       | 31541 | 208   | 165.4 | 55.6        | 17.0     | 8.8     | 70.5   |
| Strip till/fall deep band fb in-furrow <sup>2</sup> | 74           | 144       | 28221 | 208   | 174.2 | 55.5        | 17.1     | 8.5     | 71.1   |
| Strip till  | 74           | 144       | 31541 | 209   | 167.0 | 55.1        | 17.3     | 8.6     | 71.0   |
| mean  | 73           | 144       | 30166 | 208   | 167.3 | 55.5        | 17.1     | 8.7     | 70.7   |
| CV (%)  | 10.4         | 0.2       | 13.2  | 0.4   | 5.5   | 0.8         | 2.0      | 2.4     | 0.6    |
| LSD (0.05)  | 11           | NS        | NS    | NS    | NS    | NS          | NS       | NS      | 0.7    |

<sup>1</sup>All fertilizer treatments applied during planting, except fall deep band, as 10-34-0 at 6 gal/A.

<sup>2</sup>Three gal/A of 10-34-0 deep-band applied in the fall followed by 3 gal/A applied in-furrow.