

## Spring Wheat Response to Nitrogen and Organic Matter, Binford, 2009.

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The objective of this study was to examine spring wheat performance with several nitrogen (N) rates and levels of soil organic matter to provide additional information to a database to revise NDSU wheat N recommendations. Experimental design was a randomized complete block with four replications. The field study consisting of three no-till trials was conducted with Kevin Black, farm cooperater, in Nelson County. Results of spring soil analysis are in the following table:

| Trial | Organic matter (%) |             | ISNT (ppm) |             | pH  | N                  | Phosphorus | Potassium |
|-------|--------------------|-------------|------------|-------------|-----|--------------------|------------|-----------|
|       | 0-6 inches         | 6-12 inches | 0-6 inches | 6-12 inches |     | lb/A (0-24 inches) | ppm        | ppm       |
| 1     | 2.6                | 1.5         | 140        | 68          | 8.0 | 26                 | 9          | 183       |
| 2     | 5.0                | 3.8         | 424        | 287         | 7.6 | 40                 | 11         | 374       |
| 3     | 5.4                | 4.4         | 313        | 242         | 6.8 | 34                 | 22         | 310       |

Urea was preplant applied on May 11 and incorporated using a Salford RTS. 'Faller' HRS wheat was direct-seeded in previous canola ground on May 12 with 50 lb/acre of 11-52-0 applied in-furrow. The trial was harvested with a plot combine on September 1.

Wheat seed yield tended to increase with increasing N rates in the low and medium soil organic matter trials (Tables 2 and 3), while increasing N rates did not increase yield with high organic matter (Table 4). Test weight did not differ among N rates and organic matter levels. Also, seeds per pound generally were similar among N rates and organic matter levels. Seed protein generally increased with increasing N among the three organic matter levels.

| Nitrogen        | Wheat      |             |            |         |
|-----------------|------------|-------------|------------|---------|
|                 | Seed Yield | Test Weight | Seed Count | Protein |
| lb N/acre       | bu/acre    | lb/bu       | number/lb  | %       |
| untreated check | 26.2       | 61.7        | 13175      | 10.4    |
| 30              | 29.1       | 61.8        | 13037      | 11.2    |
| 60              | 30.8       | 61.1        | 13924      | 11.9    |
| 90              | 37.2       | 61.0        | 13904      | 12.3    |
| 120             | 42.6       | 61.8        | 13371      | 11.8    |
| 150             | 40.7       | 61.2        | 13319      | 12.4    |
| mean            | 34.4       | 61.4        | 13455      | 11.6    |
| C.V. (%)        | 18.7       | 1.2         | 5.8        | 5.2     |
| LSD (0.05)      | 9.7        | NS          | NS         | 0.9     |

Table 3. Wheat Response to N Rates and Medium Organic Matter, Binford, 2009.

| Nitrogen        | Wheat      |             |            |         |
|-----------------|------------|-------------|------------|---------|
|                 | Seed yield | Test weight | Seed count | Protein |
| lb N/acre       | bu/acre    | lb/bu       | number/lb  | %       |
| untreated check | 48.2       | 62.4        | 12181      | 11.1    |
| 30              | 55.5       | 62.6        | 12112      | 11.0    |
| 60              | 55.7       | 62.2        | 12366      | 11.5    |
| 90              | 65.1       | 63.0        | 12001      | 11.6    |
| 120             | 67.0       | 61.9        | 11952      | 12.2    |
| 150             | 68.4       | 62.4        | 12203      | 12.2    |
| mean            | 60.0       | 62.4        | 12136      | 11.6    |
| C.V. (%)        | 7.3        | 0.8         | 2.9        | 4.6     |
| LSD (0.05)      | 6.6        | NS          | NS         | 0.8     |

Table 4. Wheat Response to N Rates and High Organic Matter, Binford, 2009.

| Nitrogen        | Wheat      |             |            |         |
|-----------------|------------|-------------|------------|---------|
|                 | Seed Yield | Test Weight | Seed Count | Protein |
| lb N/acre       | bu/acre    | lb/bu       | number/lb  | %       |
| untreated check | 49.8       | 61.9        | 12441      | 11.0    |
| 30              | 55.4       | 61.6        | 12083      | 11.4    |
| 60              | 53.4       | 61.2        | 12607      | 12.0    |
| 90              | 55.5       | 61.0        | 12869      | 12.2    |
| 120             | 52.4       | 60.4        | 13294      | 13.1    |
| 150             | 56.7       | 60.6        | 13166      | 13.0    |
| mean            | 53.9       | 61.1        | 12743      | 12.1    |
| C.V. (%)        | 15.2       | 1.3         | 3.8        | 3.3     |
| LSD (0.05)      | NS         | NS          | 734        | 0.6     |