



# Permanent Corn Fertilizer Programs: Yield by Year. ( 2011-2018. Fields 714/715 )

### Experiment Info:

|               |               |
|---------------|---------------|
| Planted:      | 5/1/2018      |
| Harvest:      | 10/26/2018    |
| Yield Goal:   | 175 bu/A      |
| Target Fert.: | 180-30-60     |
| Variety:      | DKC 52-68 RIB |
| Population:   | 33,000        |
| Row Width:    | 30"           |
| Prev. Crop:   | Soybeans      |
| Plot Size:    | 15 x 210      |
| Replications: | 4             |

### Soil Test Values (ppm):

|           |      |
|-----------|------|
| pH:       | 6.1  |
| CEC:      | 10.5 |
| %OM:      | 2.4  |
| Bray P1:  | 10   |
| Bicarb P: |      |
| K:        | 94   |
| S:        | 4    |
| %K:       | 2.3  |
| %Mg:      | 16.7 |
| %Ca:      | 66   |
| %H:       | 14.7 |
| Zn:       | 1.2  |
| Mn:       | 6    |
| B:        | .5   |

### Objective:

Evaluate different fertilizer programs in corn for sustainability over time in a corn-soybean rotation that utilizes the same programs in the same plots year after year.

An experiment has been underway since 2011 to evaluate fertilizer program sustainability in a corn-soybean rotation. The experiment layout has a corn site adjacent to a soybean site enabling rotation from year to year and maintaining the same nutrient program inputs in the same plots. There are several treatments in the experiment for discussion here. 1) A nitrogen-only treatment for comparison. 2) AgroLiquid using In-Furrow application of reduced equivalent rates of Pro-Germinator + Sure-K + Micro 500 and a Y-Drop/sidedress application of 28% UAN + eNhance. 3) A conventional liquid/dry program with fall application of muriate of potash (0-0-62) after soybean harvest; planter-applied In-Furrow 10-34-0 + EDTA zinc and manganese and Y-Drop/sidedress application of 28% UAN. This treatment applied low rates of conventional fertilizers that equal the same rates of nutrients in the AgroLiquid treatment. 4 and 5). Conventional full rate liquid and dry programs at rates listed. Treatment yields over the eight years of the experiment are in the table:

| Long-Term Fertilizer Program Effects on Yield of Corn         |   |   |       |       |       |       |       |       |   |                                |
|---|---|---|-------|-------|-------|-------|-------|-------|---|--------------------------------|
| Programs applied to the same plots in a corn-soybean rotation |   |   |       |       |       |       |       |       |   |                                |
| North Central Research Station (Fields 714/715)               |   |   |       |       |       |       |       |       |   |                                |
|   | Fertilizer Program                                    | Application Details   |       |       |       |       |       |       | Rate/A                                    |                                |
| 1   | Nitrogen only   | 28%/eNhance (sidedress)   |       |       |       |       |       |       | 47 gal                                    |                                |
| 2   | AgroLiquid  | Pro-Germinator + Sure-K + Micro 500 (IF)<br>28%/eNhance (sidedress)                   |       |       |       |       |       |       | 3 gal + 5 gal + 2 qt<br>47 gal            |                                |
| 3   | Low-Rate Conventional<br>(nutrient lb/A = AgroLiquid) | 0-0-62 (fall after soybeans)<br>10-34-0 + 9% Zinc + 9% Mn (IF)<br>28% UAN (sidedress) |       |       |       |       |       |       | 20 lb<br>2 gal + 1 qt + 1 qt<br>47 gal    |                                |
| 4   | Conventional liquid                                   | 0-0-62 (fall after soybeans)<br>10-34-0 + 9% Zinc + 9% Mn (2x2)<br>28% UAN            |       |       |       |       |       |       | 200 lb<br>7.5 gal + 1 qt + 1 qt<br>57 gal |                                |
| 5   | Conventional dry                                      | 0-0-62 (fall after soybeans)<br>Urea + DAP + 24% zinc (preplant b'cast incorp)        |       |       |       |       |       |       | 200 lb<br>365 + 65 + 8 lb                 |                                |
| (IF) = In Furrow  |   |   |       |       |       |       |       |       |   |                                |
|   |   | 2011  | 2012  | 2013  | 2014  | 2015  | 2016  | 2017  | 2018                                      | Extra Bu/A<br>Avg. over 8 yrs. |
| 1   |   | 195.5   | 189.9 | 195.1 | 185.3 | 182.9 | 160.5 | 184.2 | 161.5                                     | 181.9                          |
| 2   |   | 213.8   | 217.9 | 213.6 | 189.4 | 224.7 | 160.9 | 212.1 | 189.3                                     | 202.7                          |
| 3   |   | 202.9   | 204.7 | 196.4 | 184.2 | 196.2 | 159.9 | 190.7 | 170.8                                     | 188.2                          |
| 4   |   | 207.7   | 197.1 | 207.1 | 195.6 | 221.4 | 160   | 212.5 | 189                                       | 198.8                          |
| 5   |   | 202.4   | 196.4 | 208.4 | 193.8 | 224.6 | 169.4 | 197.5 | 183.8                                     | 197.0                          |
|   |   | 204.5   | 201.2 | 204.1 | 189.7 | 210.0 | 162.1 | 199.4 | 178.9                                     | 193.7                          |

### Conclusions:

- The yields have been very good over the course of eight years in this dryland experiment. Highest average yield is with the AgroLiquid program, despite application of 42% less pounds/A of N-P<sub>2</sub>O<sub>5</sub>-K<sub>2</sub>O compared to the full rate conventional programs (157 lb vs 270 lb).
- One benefit of a multi-year experiment like this is the ability to assess program sustainability. The AgroLiquid yield has been maintained over time compared to the conventional treatments. Compared to the N-only treatment, AgroLiquid produced an additional 166.5 Bu/A, which is much greater than conventional treatments.
- AgroLiquid's nutrient formulation advantage is proven where with equal pounds of nutrient application, yield with AgroLiquid is much greater than conventional formulations, AgroLiquid produced an extra 116 Bu/A over 8 years.