Ray Bange, western Kansas irrigated producer, Eric Moore, independent agronomist, review 3 years of Exactrix test plots with Idaho producers... Less Is More.

Exactrix test plots, randomized and replicated 3 times, measured with a scale, using an independent agronomist, produces a new understanding of nutrient efficiency.

Exactrix owners receive $1000 for valuable nutrient management data. Results of test plots indicate nutrients are over applied.... Why? Non uniform application of the “old fashioned” metering systems and poor timing.

Wheat.. considered Exactrix TAPPS No-Tillage Systems compared to Tillage Systems.

Annual No-till winter wheat. Exactrix dual product TAPPS


Summer fallow winter wheat-tillage system was sold to crop insurance for a 6 bushel per acre.

Corn.. considered Exactrix TAPPS No-Tillage Systems compared to Tillage Systems.

Annual No-till corn on winter wheat stubble of 2006 with Exactrix TAPPS rotational band loading. On the left pre-plant nutrients applied no-till with Exactrix Deere wing injection.


The Exactrix owner was so proud of the decision to implement Exactrix technology that he called our staff to visually see the results as shown in these photos.
Exactrix Test Data supplied by producer Ray Bange, Colby, KS, and Eric Moore, Agronomist.

Exactrix Gram, $1,000 paid to all Exactrix producers generating randomized and replicated plots to determine nitrogen use efficiency.

November 2003.
No difference in yield, 220 to 110 lbs. N/A.
Maximum Economic Yield: 118 lbs. N/A. 28 P.
Point of diminishing return: not determined.

Significant Placed Nutrient Advantage:
1. Exactrix low CV, uniform application.
2. Dual Placement, APP

Exactrix 2KFT, Single Disc Bourgault, 30’ centers applied 6’ from side of Ridge.
All applications dual applied with 7 gallons of 10-34-0 or 28 lbs. P/A, 8 lbs. N/A in the NH3 band.

### Lbs. N/A applied as NH3:

<table>
<thead>
<tr>
<th>Lbs.</th>
<th>Bushels per Acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>220</td>
<td>218.9 bu/A</td>
</tr>
<tr>
<td>190</td>
<td>216.2 bu/A</td>
</tr>
<tr>
<td>170</td>
<td>214.8 bu/A</td>
</tr>
<tr>
<td>150</td>
<td>221.0 bu/A</td>
</tr>
<tr>
<td>130</td>
<td>215.1 bu/A</td>
</tr>
<tr>
<td>110</td>
<td>218.5 bu/A</td>
</tr>
<tr>
<td>90</td>
<td>218.5 bu/A</td>
</tr>
<tr>
<td>70</td>
<td>218.5 bu/A</td>
</tr>
<tr>
<td>50</td>
<td>218.5 bu/A</td>
</tr>
</tbody>
</table>

- The soil test indicated 50 lbs. N/A carryover.
- The soil testing lab recommended 190 lbs. of N/A be applied.
- High heat during flowering lowered yield potential.
- The center pivot average 218 bushels per acre across the Coop scale.

Field Goal 225 bushels per acre based on 1.1 N/bu. at 198 lbs. N/A applied field wide.
220 +8+50= 278 lbs N/A or 1.27 lbs. N/Bu.
110 + 160= 168 lbs N/A or .77 lbs N/Bu.

248 pounds of N total available on the balance of the field would allow 225 bushels per acre at 1.1 pound of N per bushel.

* My crop scout commented, that due to the dry conditions during the anhydrous application, he could smell anhydrous ammonia days after the applications were made in many fields applied with chisel applicators with pressure reducing NH3 systems. He couldn’t detect the smell in the Exactrix, single disc, no-till, applied field even during the application. This field will go back to beans in 2004. I will maintain the ridges and repeat the test on the same rows in the 2005 corn crop*. Ray Bange

Exactrix Test Data supplied by producer Ray Bange, Colby, KS. and Eric Moore, Agronomist.

CORN

November 2004.
No difference in yield. 195 to 45 lbs. N/A.
Maximum Economic Yield: 45 lbs. N/A.
Point of diminishing return: 45 lbs. N/A.

Ridge Till, No-till nutrient placement:
1. Exactrix low CV, NH3 application.
2. Exactrix Delta P, Forming TAPPS.

Ray Bange, Colby, KS, Corner Pivot, Ridge Till Soybean Rotation. Spring Applied 30 days ahead of planting. Exactrix 2KPT, Single Disc Bourgault, 16" centers. Dual application of 10-34-0, APP and 12-0-0-2SS, ATS was made with an Exactrix Delta P manifold forming TAPPS crystals in the no-till placed nutrient band.

All applications were TAPPS dual applied maintaining an Ortho Ratio of 27-12-0-75. Corn Soybean rotation on 30" centers.

Fall fertilizer recommendation for 200 bushel corn. 200 pounds N/A, 60 pounds P/A, 80 pounds of N applied from soybean credits and growing season mineralization of N. 5 applied to stabilize the band and provide $ for N and P efficiency. APP/ATS raised in Ortho Ratio to assure N performance.

Seventy years of continuous No-Till Ridge till in a 7.5 to 8.0 pH at a 1.9% to 2.5% OM in the top 6 inches. The Fall soil test shows increasing OM.

Irrigated corn, Golden Harvest 9250, BT and Round-up Ready. 32,000 population. Growing season cool and wet with a warm September.

Pounds N/A, at MEY, MRP. 179 lbs. N/Bu. Pounds N/Bu, supplied by OM. 621 lbs. N/Bu.

A total of 156 pounds of N/A, supplied by soybean legume and the Organic Matter soil site. Soil solution P also supplied by the soil site and OM at unexpected rates.

<table>
<thead>
<tr>
<th>Pounds N/A applied</th>
<th>Yield, Bu/A</th>
<th>NP&amp;S cost, Gross Margin</th>
</tr>
</thead>
<tbody>
<tr>
<td>as NH3, APP, ATS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>195</td>
<td>258.42 Bu/A</td>
<td>$72.77, $379.77</td>
</tr>
<tr>
<td>170</td>
<td>254.42 Bu/A</td>
<td>$63.44, $381.79</td>
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<tr>
<td>145</td>
<td>261.17 Bu/A</td>
<td>$54.11, $402.94</td>
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<tr>
<td>120</td>
<td>257.19 Bu/A</td>
<td>$44.76, $405.31</td>
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<td>95</td>
<td>253.2 Bu/A</td>
<td>$35.45, $407.66</td>
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<tr>
<td>70</td>
<td>252.08 Bu/A</td>
<td>$16.12, $415.02</td>
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<tr>
<td>45</td>
<td>252.06 Bu/A</td>
<td>$16.70, $424.32</td>
</tr>
</tbody>
</table>

MRP, MEY, Equilibrium.

No-Tillage System in Equilibrium

Maximum Economic Yield and Marginal Return Point. 45 N, 20 P, 12 S.
$16.79 brought $425.32 per acre return at $1.75/Bu. or 3.8% of margin

Bushels per Acre: 150, 200, 250, 300

Notes: Fall soil sampling; Typical OM top 4 inches 2.8%, 4-8 inches, 2.2%. The fall soil sampling showed OM up at least 8% from spring samples of 1.9%.

Field wide average across the Crop Scale was 255.45 bushels per acre. Third year testing will include tissue test and stalk nitrate test.

Pots were randomized and replicated 3 times using a weigh wagon. Each plot at .5186 acres. Corn Moisture adjusted to 15.9%.

Test, Ray Bange, Nov. 2004
2005, 3rd year.

No-Tillers, Red Alert.

Exactrix Test Data supplied by producer Ray Bange, Colby, KS, and Eric Moore, Agronomist.

CORN

Exactrix-Gram. $1,000 paid to all Exactrix producers generating randomized and replicated plots to determine nitrogen use efficiency.

November 2005.
No difference in yield. 195 to 90 lbs. N/A.
Maximum Economic Yield: 45 lbs. N/A.
Point of diminishing return: 45 lbs. N/A.

Ridge Till, No-till nutrient placement:
1. Exactrix low CV, NH3 application.
2. Exactrix Delta P, Forming TAPPS.

Ray Bange, Colby, KS, Center Plots, Ridge Till, Soybean Rotation. Spring Applied 30 days ahead of planting. Exactrix 2KFT, Single Disc Bourgault, 15" centers. Dual application of 10-34-0, APP, and 12-0-0-28S, ATS was made with an Exactrix Delta P manifold forming TAPPS crystals in the no-till placed nutrient band.

All applications were TAPPS dual applied maintaining an Ortho Ratio of 27-12-0-7S. Corn Soybean rotation on 30" centers.

Soil recommendation for 200 bushel corn, 80 pounds N/A, 80 pounds P/A. 80 pounds of N expected from soybean credit and growing season mineralizations of N. S applied to stabilize the band and provide S for N and P efficiency. APP/ATS raised in Ortho Ratio to assure N performance.

Nine years of continuous No-Till/Ridge Till in a 7.5 to 7.8 pH at a 1.5% OM at planting to 2.5% OM fall test in the top 6 inches. The fall soil test shows increasing OM.

Irrigated corn, Golden Harvest 5220, BT and Round-up Ready. 32,000 population. Weather considered abnormally with hot dry August winds.

Pounds N/A at MEY, MRP, 183 lbs. N/A. Pounds N/A, supplied by OM, .617 lbs. N/A. A total of 152 pounds of N/A supplied by soybean legume and the Organic Matter soil life. Soil solution P also supplied by the soil life and OM at unexpected rates.

<table>
<thead>
<tr>
<th>Pounds N/A applied as NH3, APP, ATS</th>
<th>Yield, Bu/A</th>
<th>NP2S cost, Gross Margin</th>
</tr>
</thead>
<tbody>
<tr>
<td>195</td>
<td>263.22</td>
<td>$82.55, $378.09</td>
</tr>
<tr>
<td>170</td>
<td>261.76</td>
<td>$71.96, $386.92</td>
</tr>
<tr>
<td>145</td>
<td>261.74</td>
<td>$61.38, $396.67</td>
</tr>
<tr>
<td>120</td>
<td>264.75</td>
<td>$50.80, $412.51</td>
</tr>
<tr>
<td>95</td>
<td>262.78</td>
<td>$40.22, $419.65</td>
</tr>
<tr>
<td>70</td>
<td>251.23</td>
<td>$28.83, $410.77</td>
</tr>
<tr>
<td>45</td>
<td>245.92</td>
<td>$25.05, $411.31</td>
</tr>
</tbody>
</table>

No-Tillage System in Equilibrium:
Maximum Economic Yield and Marginal Return Point 45 N, 20 P, 12 S.
$19.95 brought $411.31 per acre return at $1.75/Bu. or 4.4% of margin.

Bushels per Acre
150 200 250 300

Notes: Fall soil sampling: Typical OM top 4 inches 2.8%, 4.8 inches 2.3%. The fall soil sampling showed OM up at least .8% from spring samples of 1.9%.

Third year testing will include tissue test and stalk nitrate test.

Plots were randomized and replicated 9 times using a weigh wagon. Each plot .51368 acres. Corn Moisture adjusted to 15.0%.

Test, Ray Bange, Nov. 2005