Integrating Environmental Accounting into AgTools™

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What is AgTools™?

• Evaluates the **profitability** and **feasibility** of different management strategies and cropping systems, at the individual farm level.

• **Suite of Software Programs:**
  - *AgProfit™* - Determines how changes in input costs, output costs, and yields affect profitability (20 years)
  - *AgLease™* - Establishes equitable crop shares
  - *AgFinance™* - Analyzes liquidity, solvency, and repayment capacity (10 years)
Internship Project

- **Literature Review**
  - Environmental effects of agricultural practices
  - Direct seed vs. conventional tillage wheat production (PNW)

- **AgTools\textsuperscript{TM} Analysis**
  - Direct seed vs. conventional till winter wheat-summer fallow rotation, less than 12 inch precip. zone
  - Annual cropping vs. winter-wheat and summer fallow with and without climate change
Literature Review

- **AgEnvironment Components and Tools**
  - GHG Emissions, soil erosion, water use, herbicides, pesticides, and fertilizers
  - GHG Emissions- Cool Farm Tool
  - Soil Erosion- USDA Rusle2 and WEPP
  - Pesticides- Cornell EIQ Equation

**Direct Seed vs. Conventional Till WW-SF Production**

- No-till production requires about 4 additional herbicide applications (Esser).
- No-till early averages a higher yield (~70bu/acre) but late no-till produces 20% less (Esser).
- No Till allows for fewer trips across the field resulting in less fuel consumption (Perry).
## Winter Wheat-Summer Fallow

Direct Seed vs. Conventional Tillage

Less than 12 inch Precipitation

<table>
<thead>
<tr>
<th></th>
<th>Direct Seed</th>
<th>Conservation Tillage</th>
<th>Difference</th>
</tr>
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<tbody>
<tr>
<td>Total Net Returns</td>
<td>$378.99</td>
<td>$259.24</td>
<td>$119.75</td>
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<td>Net Present Value</td>
<td>$306.80</td>
<td>$218.06</td>
<td>$88.74</td>
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<td>Sensitivity Analysis</td>
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<tr>
<td>Total Net Returns</td>
<td>$245.11</td>
<td>$259.24</td>
<td>($14.13)</td>
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<tr>
<td>Net Present Value</td>
<td>$220.95</td>
<td>$218.06</td>
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W. Wheat-Summer Fallow vs. Annual Cropping With and Without Climate Change

• **Before Climate Change**
  o W. Wheat-Summer Fallow
    - *12-18 inch* precipitation zone
    - Randomized *historical yields* (Sherman County)
  o Annual Cropping: W. Wheat, Camelina, Canola, Peas
    - Market sensitivity analysis- varying yields and net returns

• **After Climate Change**
  o W. Wheat-Summer Fallow
    - *18-24 inch* precipitation zone
    - *Projected yields* from Global Climate Models (Umatilla County)
    - Increase Fertilizer costs and sprays, insert insecticides and fungicide
  o Annual Cropping: W. Wheat, Camelina, Canola, Peas
    - Market Sensitivity analysis- varying yields and net returns
    - Increased yields and fertilizer costs
Research Takeaways

• Research takes time
  o Changes routes
  o Have to narrow scope
  o Takes time to find answers and apply them
  o Hard to not get caught up on little things

• We learned how to research
  o What we would do differently next time
Sources

Questions?