Integrating Environmental Accounting into *AgTools*™

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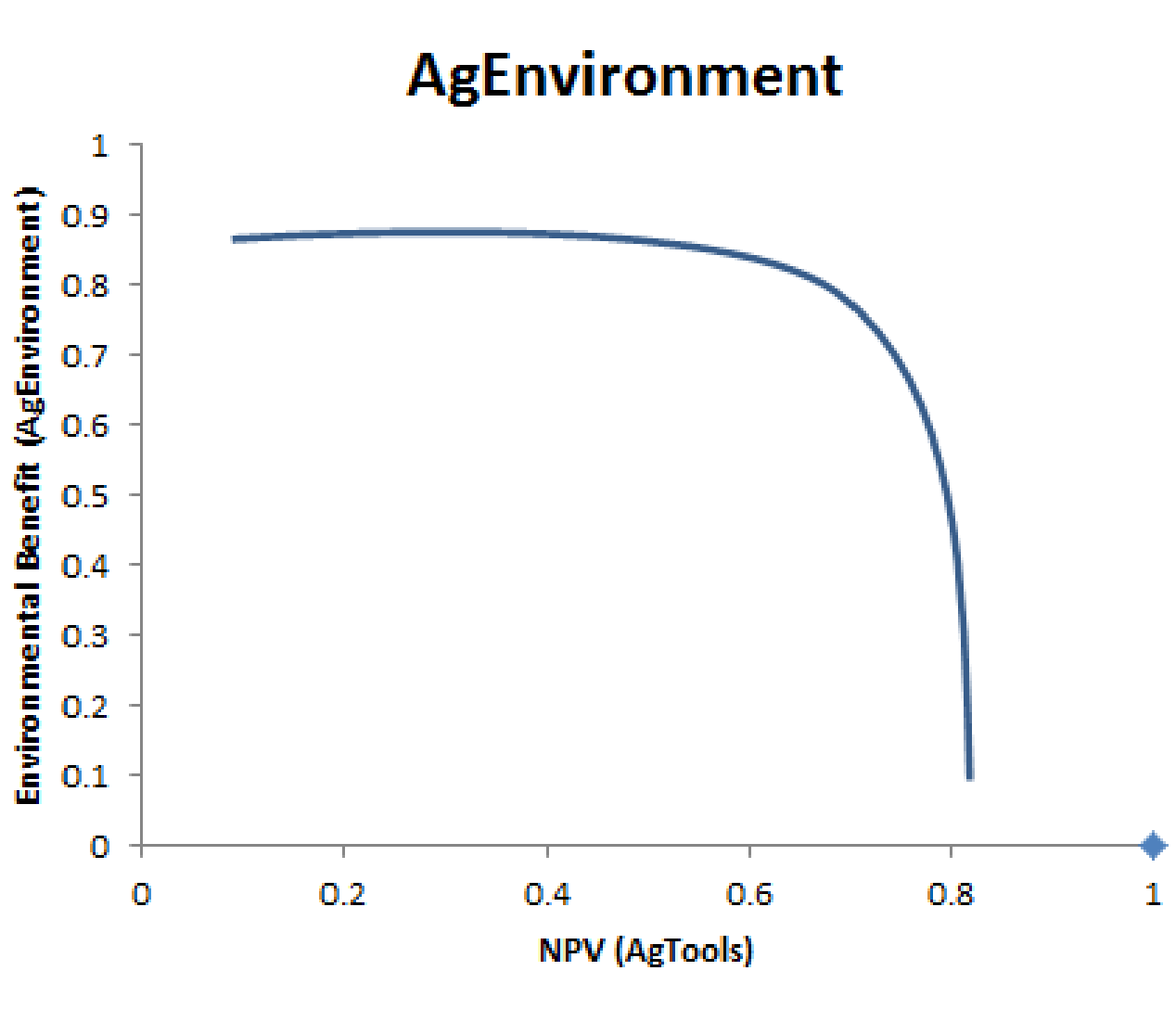
What is *AgTools*™?

- 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)


AgEnvironment
Environmental Benefit (AgEnvironment)
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0
0.2
0.4
0.6
0.8
1
NPV (AgTools)

Internship Project

- **Literature Review**
  - Environmental effects of agricultural practices
  - Direct seed vs. conventional tillage wheat production (PNW)
- ***AgTools*™ Analysis**
  - Direct seed vs. conventional till winter wheat-summer fallow rotation, less than 12 inch precipitation 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 University 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 Till Less than 12 inch Precipitation

	Direct Seed	**Conservation Tillage**	Difference
Total Net Returns	**$378.99**	$259.24	$119.75
Net Present Value	$306.80	$218.06	$88.74
Sensitivity Analysis			
Total Net Returns	$245.11	$259.24	($14.13)
Net Present Value	$220.95	$218.06	$2.89

W. Wheat-Summer Fallow vs. Annual Cropping Before and After Climate Change

- **Before Climate Change**
  - **W. Wheat-Summer Fallow**
    - ***12-18 inch*** precipitation zone
    - Randomized ***historical yields*** (Sherman County)
  - **Annual Cropping: W. Wheat, Camelina, Canola, Peas**
    - Market sensitivity analysis- varying yields and net returns
- **After Climate Change**
  - **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
  - **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**
  - Changes routes
  - Have to narrow scope
  - Takes time to find answers and apply them
  - Hard to not get caught up on little things

- **We learned the research process**

Sources

- Perry, Ann. March, 2011. *Testing No Till Winter Wheat in the Pacific Northwest. USDA-ARS*. http://www.ars.usda.gov/is/AR/archive/mar11/wheat0311.pdf
- Esser, A.D. May, 2013. *No-till and Conventional Tillage Fallow Winter Wheat Production Comparison in the Dryland Cropping Region of Eastern Washington*. Journal of the NACAA, Volume 6, Issue 1. http://www.nacaa.com/journal/index.php?jid=227

Questions?