

## SOIL HEALTH PREDICTIVE ASSESSMENT REPORT

### ABRIDGED VERSION

**For: Zac Weidner**  
**Macoupin County, Illinois**  
**Date: March 2, 2021**

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**Study Area and Planned Practices:**

- Study Area Name and Acreage: Janet’s 40, 40-acre field
- Crop Rotation: Corn-Soybean
- Soil Health Practices Assessed:
  - No-Till – Reduced, vertical tillage to no-till for corn
  - Cover Crops – No cover crop to cover crop mix planted in Fall after corn and soybean
  - Nutrient Management – No Anhydrous Ammonia applied in Fall after corn

### Short-Term Economic Analysis

**Potential Short-Term Annual Economic Effects:**

**Table 1: Potential Short-Term Annual Economic Effects of Soil Health Practices**

Positive Effects				Negative Effects			
Increase in Income				Decrease in Income			
Item	Per Acre	Acres	Total	Item	Per Acre	Acres	Total
None identified	\$0.00	0	\$0	None identified	\$0.00	0	\$0
<b>Total Increased Income</b>			<b>\$0</b>	<b>Total Decreased Income</b>			<b>\$0</b>
Decrease in Cost				Increase in Cost			
Item	Per Acre	Acres	Total	Item	Per Acre	Acres	Total
Machinery cost savings due to no-till	\$6.17	40	\$247	Typical learning costs	\$2.81	40	\$112
Herbicide savings for soybeans due to cover cropping	\$21.50	20	\$430	Cover crop costs	\$43.70	40	\$1,748
Machinery cost savings due to one less fertilizer application	\$12.29	40	\$492	Increased fertilizer cost for corn due to cover crops	\$4.20	20	\$84
Fertilizer savings for corn due to change in nutrient management	\$9.80	20	\$196	2x2 equipment upgrade	\$4.00	40	\$160
Work moves from spring to fall (better distribution of labor)	\$7.50	40	\$300	Liquid storage tanks	\$2.00	40	\$80
Reduced erosion keeps nutrients in field and eliminates field repairs	\$28.88	40	\$1,155	Liquid tender	\$3.00	40	\$120
<b>Total Decreased Cost</b>			<b>\$2,820</b>	<b>Total Increased Cost</b>			<b>\$2,304</b>
<b>Annual Total Increased Net Income</b>			<b>\$2,820</b>	<b>Annual Total Decreased Net Income</b>			<b>\$2,304</b>
<b>Total Acres in this Study Area</b>			<b>40</b>	<b>Total Acres in this Study Area</b>			<b>40</b>
<b>Annual Per Acre Increased Net Income</b>			<b>\$71</b>	<b>Annual Per Acre Decreased Net Income</b>			<b>\$58</b>
<b>Annual Change in Total Net Income = \$516</b>							
<b>Annual Change in Net Income Per Acre = \$13</b>							
<b>Return on Investment = 22%</b>							

**Notes:**

- This table represents costs and benefits over the entire study area (40 acres) as reported by the farmer.
- All values are in 2019 dollars except for fertilizer values.
- Farmer-supplied fertilizer prices: Nitrogen: \$.28/Lb, Phosphate: \$.37/Lb, Sulfur: \$.54/Lb (Zac Weidner, 2020).
- Reduced soil erosion benefits are based on farmer-estimated savings in field repairs.



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## Long-Term Economic Analysis

### Potential Long-Term Economic Effects due to increase in Soil Organic Matter:

**Table 2: Potential Long-Term Annual Benefits for 20 Years of Soil Health Practice Use**

Benefit Category	Per Acre	Affected Acres	Study Area
Discounted Annual Yield Increase	\$48.31	40	\$1,932
Discounted Annual Soil Fertility Benefit	\$4.22	40	\$169
Discounted Annual Water Storage Benefits	\$4.49	40	\$180
<b>Total Annual Long-Term Benefits</b>	<b>\$57.02</b>	<b>40</b>	<b>\$2,281</b>

**Table 3: Potential Long-Term Annual Benefits for 5 Years of Soil Health Practice Use**

Benefit Category	Per Acre	Affected Acres	Study Area
Discounted Annual Yield Increase	\$15.33	40	\$613
Discounted Annual Soil Fertility Benefit	\$1.34	40	\$54
Discounted Annual Water Storage Benefits	\$1.43	40	\$57
<b>Total Annual Long-Term Benefits</b>	<b>\$18.10</b>	<b>40</b>	<b>\$724</b>

**Table 4: Predictive Assessment Short-Term and Long-Term Combined Results**

5-Year Planning Horizon			
Result Category	Per Acre	Affected Acres	Study Area
Short-Term Annual Change in Net Income	\$13	40	\$516
Total Annual Long-Term Benefits	\$18	40	\$724
<b>Total Long-Term and Short-Term Annual Change in Net Income</b>	<b>\$31</b>	<b>40</b>	<b>\$1,240</b>
Return on Investment	53%		
Number of Years before Break Even	0		
20-Year Planning Horizon			
Result Category	Per Acre	Affected Acres	Study Area
Short-Term Annual Change in Net Income	\$13	40	\$516
Total Annual Long-Term Benefits	\$57	40	\$2,281
<b>Total Long-Term and Short-Term Annual Change in Net Income</b>	<b>\$70</b>	<b>40</b>	<b>\$2,797</b>
Return on Investment	121%		
Number of Years before Break Even	0		

### Summary of Results

- The short-term analysis estimates a \$13 potential increase in net income per acre per year and a 22% return on investment (ROI).
- The long-term 5-year analysis estimates that, with improved soil health, net income could improve by an additional \$18 per acre per year, resulting in a total long-term and short-term annual change in net income of \$31 per acre per year, or a 53% ROI.
- The long-term 20-year analysis indicates that, with improved soil health, net income could improve by an additional \$57 per acre per year, resulting in a total long-term and short-term annual change in net income of \$70 per acre per year, or a 121% ROI.
- The break-even analysis determines the year that cumulative total benefits exceed cumulative total costs. In Zac's case, the break-even analysis indicates that in year one of soil health practice adoption, Zac's investment in soil health practices is profitable.