Cover Crops for Corn Production – Nitrogen Value?

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NW Research Station, Ohio

- In the spring of 2006 we interseeded wheat with red clover at a seeding rate of 10 lbs/acre
- We established a good clover stand (unlike the previous year) and allowed it to grow until late fall

NW Research Station. Ohio

- **In late fall (late October / early November), we either incorporated the clover with tillage or we killed it with glyphosate**

Red Clover

NW Research Station, Ohio

- In the spring, corn was planted in late April with 30 pounds of starter (no starter on the 0 N checks)
- Corn was sidedressed with UAN to reach total N rates of 80 and 160 pounds per acre

Soil Nitrate Levels

- **Presidedress soil nitrate test levels as affected by cover crop**

Cover crop	Nitrate level (ppm)
No cover	7.25
Clover no-till	7.75
Clover till	7.75

- **Cover crop did not affect PSNT (measured in early June)**

Corn Yields 2007

- **Main effect of cover crop on corn yield**

Cover crop	Corn yield (bu/acre)
No cover	98 a
Clover no-till	116 b
Clover till	124 c

-means followed by different letters are statistical significant at the 0.05 probability level

- **Cover crop did affect corn productivity**

Corn Yields 2007

- **Main effect of nitrogen rate on corn yield**

N rate (lb/acre)	Corn yield (bu/acre)
0	72 a
80	129 b
160	137 c

-means followed by different letters are statistical significant at the 0.05 probability level

- **Corn was responsive to N**

2008 NW Research Station
Red Clover, N Rate, No-till

Cover Crop	Sidedress N Rate	Corn Yield				
No clover	0	28.9	A			
Clover	0	30.2	A			
No clover	80	84.4		B		
Clover	80	95.4			C	
No clover	160	115.5				D
Clover	160	125.1				E
	LSD (0.10)	9.4				

NW Corn Yields 2008

- **Main effect of cover crop on corn yield**

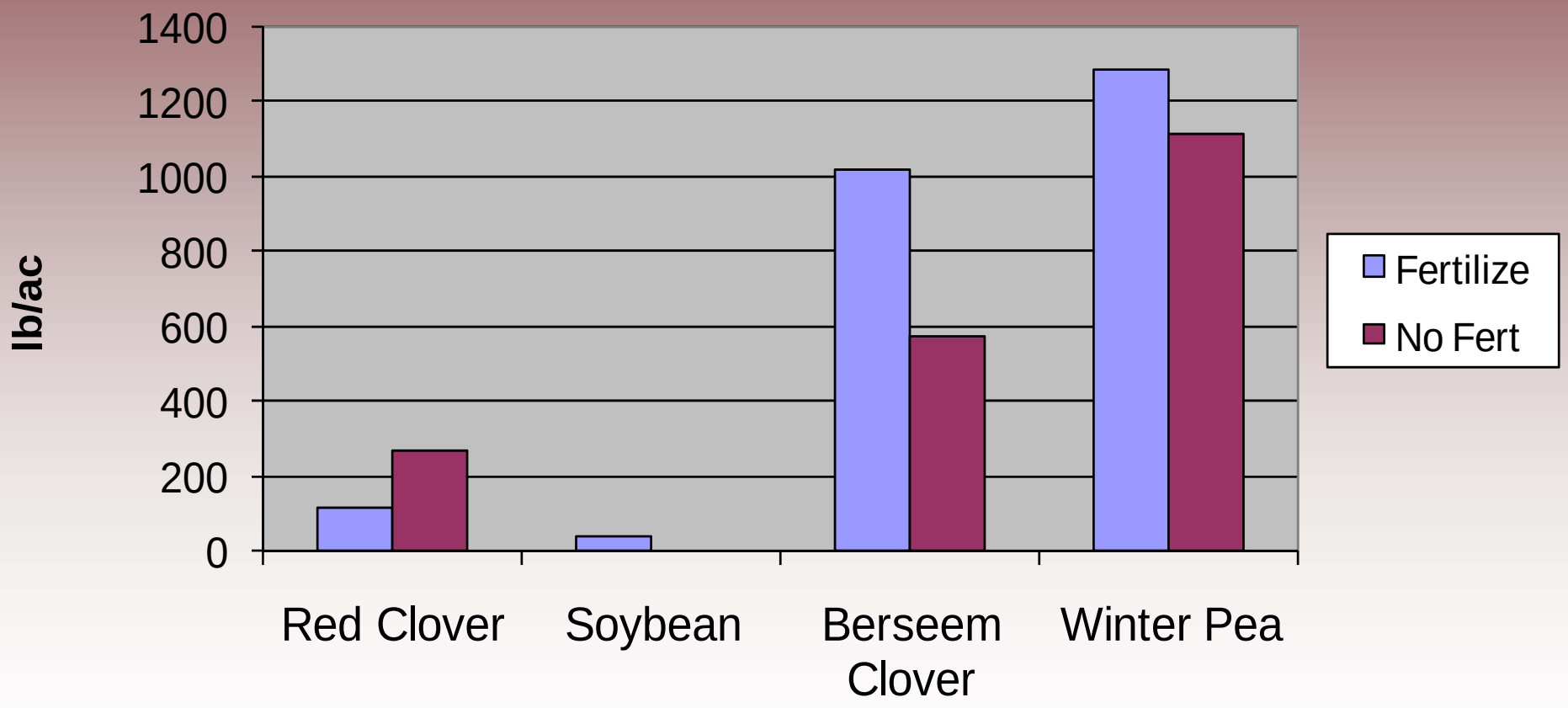
Cover crop	Corn yield (bu/acre)
No cover	76.3
Clover no-till	83.6
Clover till	85.8

-means followed by different letters are statistical significant at the 0.05 probability level

- **Cover crop did affect corn productivity**

Biomass

NW Branch 10-13-08



Western Ohio Research Station

- Red clover was drilled after wheat harvest (mid-July)
- Clover was allowed to grow all winter and the stand was terminated in the spring with tillage or glyphosate in late April
- Corn was planted in early May
- Corn was sidedressed in late May

Corn Yields

- **Main effect of cover crop on corn yield**

Cover crop	Corn yield (bu/acre)
No cover	178 ab
Clover no-till	187 a
Clover till	153 b

-means followed by different letters are statistical significant at the 0.1 probability level

- **Cover crop did affect corn productivity**

Corn Yields

- **Main effect of nitrogen rate on corn yield**

N rate (lb/acre)	Corn yield (bu/acre)
0	161 a
80	168 a
160	190 c

-means followed by different letters are statistical significant at the 0.05 probability level

- **Corn was responsive to N**

Summary

- Cover crop did not affect corn yield compared to the no cover treatment
- Neither a rotational effect or N benefit could be identified
  - There was tremendous variability in this study that did affect our ability to pick out differences

Western Research Station-Watters

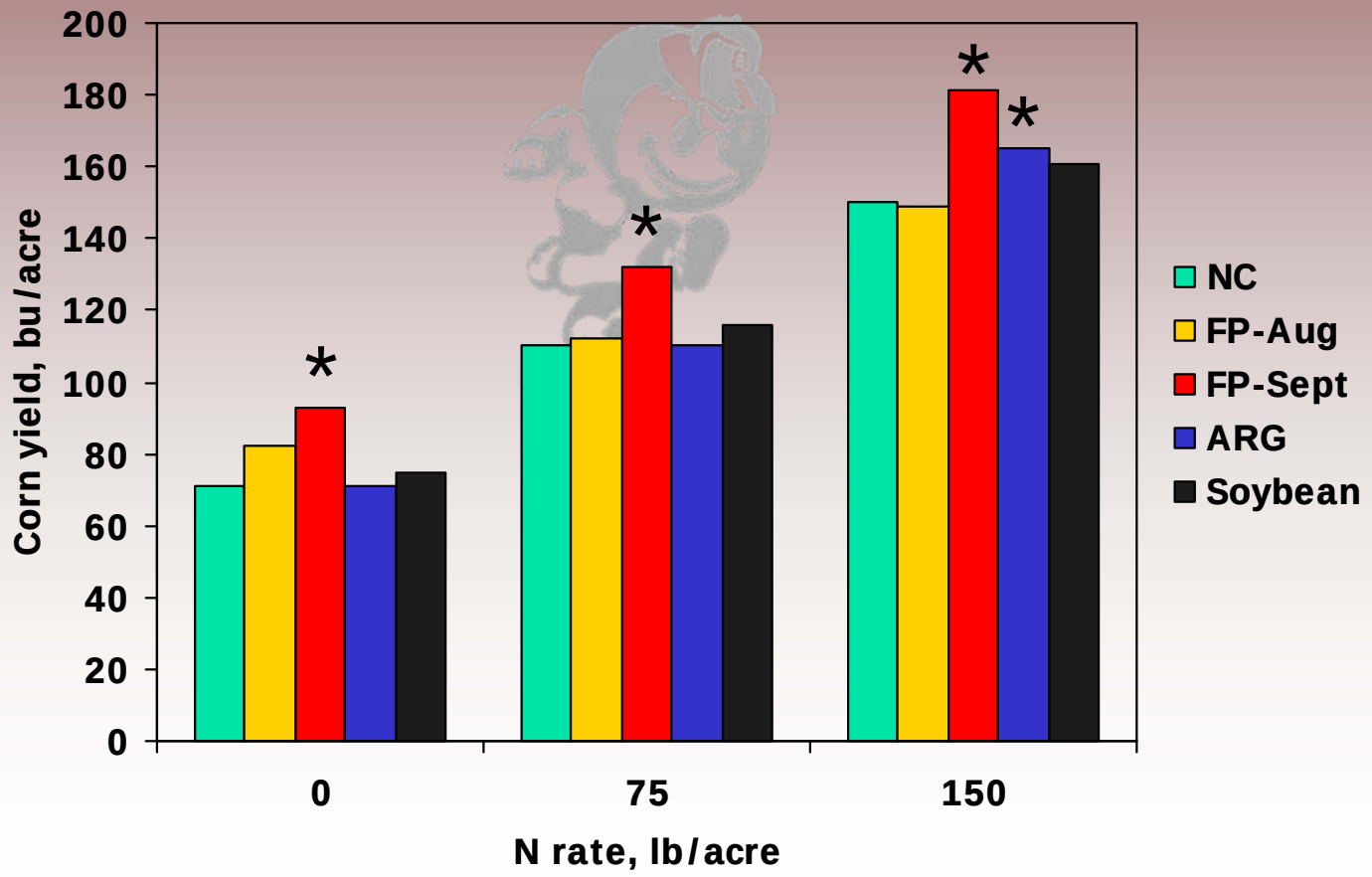
- Three different cover crops after wheat (field pea, annual ryegrass, and soybean)
- Field pea was planted on two dates – August 23 and September 26
- Annual ryegrass was planted on September 26
- Soybean was planted on August 23

Western Research Station-Watters

- **Cover crops were terminated in the spring with herbicide**
- **Three N rates – 0, 75, and 150 lb N/acre**

Corn Yields

- **Simple effects of cover crop and N rate on corn yield**



East Badger Farm, Wooster, OH

- Planted two cover crops (hairy vetch and annual ryegrass) after wheat harvest in early August
- Terminated the cover crops in late April with glyphosate
- Planted corn in early May
- Applied 30 pounds of N with the planter
- Six different sidedress N rates (0, 40, 80, 120, 160, and 200 lb/acre injected UAN at V7-8)

East Badger Farm

- **Annual ryegrass established well, but the hairy vetch did not do well at all**
- **It was there but very sparse**

Corn Yields

- **Main effect of cover crop on corn yield**

Cover crop	Corn yield (bu/acre)
No cover	185 a
Hairy vetch	176 a
Annual ryegrass	173 a

-means followed by different letters are statistical significant at the 0.1 probability level

- **No impact of cover crop on yield**

Corn Yields

- **Main effect of nitrogen rate on corn yield**

N rate (lb/acre)	Corn yield (bu/acre)
0	157
40	169
80	183
120	180
160	195
200	184

Conclusions

- **Leguminous cover crops may hold some value after wheat harvest**
- **Variability in success of plant stand**
- **Rotational vs Nitrogen benefit**
- **Economic Return on inputs**

Agronomic Updates

- **Crop Observation & Recommendation Network**
- **Electronic Newsletter**
- **http://corn.osu.edu**