Alternative Row Spacing for Corn Grain: Preliminary Findings for NY

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- Thanks to Rodman and the family for time and effort spent
  - sharing data and other information from on farm trials, and
  - helping develop the partial budget analyses used to estimate expected changes in profit associated with the change from 30 to 15 inch row spacing of corn grain

Summary

- Switching from 30 in. to 15 in. row spacing for corn grain can be an advantageous change for no-till, corn soybean farm with about 3,000 acres
- When expected corn price is $5.56 per bushel, expected change in annual profit varies from about $23,000 to about $104,000, for % changes in yield from 0.6 to 7.5 %, respectively
- Sensitivity of results suggests that farm operators should develop analyses specific to conditions on their farms

Research Questions

- Are narrow row widths attractive for corn grain, under what conditions, in NY?
- What are expected changes in profit associated with a change from 30 inch to narrow rows of corn grain?
- What factors, assumptions are results sensitive to?

Narrow Row, Corn Grain

What is it?

- Less than 30 in. row widths leading to more equidistant spacing to min the effects of competition among corn plants for nutrients, water, light
- Examples include 22, 20, 15 in. rows and twin rows

Possible Advantages

- Improved nutrient uptake, efficiency
- Better weed control
- Less water lost to evaporation
- Decreased soil erosion

All hopefully help to optimize yields

Possible Disadvantages

- Limitations for cultivating, side dressing, and other post emergence crop work
- Increased machinery ownership & operating costs

Analyses for Evaluating Potential

- On farm research to examine yield, row width response and others, e.g., pop effects
- Cost of production
- Partial budget analysis for profit

Partial Budget Analysis

Definition

Analysis that estimates the expected ***change*** in profit (available cash, other measures of economic performance) associated with a proposed ***change*** in the farm business

Characteristics

- Analyzes a proposed change compared to the present farm business
- Includes only the changes in income and costs -- not the total values -- marginal analysis

Partial Budget Answers

What new or addt'l income will be received?
What current costs will be reduced or eliminated?
What current income will be lost or reduced?
What new or addt'l costs will be incurred?

Characteristics – continued

- Provides an estimate of the increase, or decrease in profit (or cash available)
- Says nothing about the change relative to alternative uses of resources

Partial Budget for Profit

Items that Increase Profit

- Added value of production, income
- Reduced costs
- Total increases to profit (A)

Items that Decrease Profit

- Reduced value of production, income
- Added costs
- Total decreases to profit (B)
- **Expected change in profit (A - B)**

Some Assumptions

- WNY corn grain, soybean study farm working poorly drained, clay soils
- 3,200 total acres, half corn, half soybeans in rotation
- No till cropping system
- 2013 on farm trial results
  - 15 in. vs. 30 in. row spacing trials planted May 4 through 15, 2013
  - Planted pop approx. 33,000 per acre
- Average future year, before tax, marginal analysis

Selected Machinery Ownership and Operating Costs, 30 inch and 15 inch Row Spacing of Corn Grain, No-Till Cropping System, Preliminary, Fall 2013

Cost	30 inch Row Spacing		15 inch Row Spacing	
	16 row, 30 in. no-till planter	8 row, 30 in. corn head	32 row, 15 in. no-till planter	16 row, 15 in. corn head
	--- Dollars per Year ---			
Ownership				
Deprec. & Int.	17,076	4,889	22,146	6,524
Other	1,740	348	2,220	480
Total	18,816	5,237	24,366	7,004
	--- Dollars per Hour ---			
Repair & Maint.	29.04	12.39	40.76	17.89

Notes: Ownership costs include depreciation, interest as an opportunity cost, insurance, taxes and housing. Repair and maintenance costs are considered variable costs.

Added Value of Production and Reduced Costs, 15 in. vs. 30 in. Rows, Corn Grain, Study Farm, Average Future Year

Added Value of Production	
1. Value of added corn grain prod.	$44,011
Reduced Costs	
1. Labor	$181
2. Fertilizer & lime	$17,449
3. Spray and other	$8,392
4. Fixed	
• 16 row, 30 in. planter	$18,816
• 8 row, 30 in. corn head	$5,237

Reduced Value of Production and Added Costs, 15 in. vs. 30 in. Rows, Corn Grain, Study Farm, Average Future Year

Reduced Value of Production	
Added Costs	
1. Fuel & lube	$164
2. Repair & maintenance	
• tractors and self propelled	$30
• equipment	$2,204
3. Fixed	
• 32 row, 15 in. planter	$24,366
• 16 row 15 in. corn head	$7,004

Partial Budget Analysis, Profit, 15 in. vs. 30 in. Rows Corn Grain, WNY Study Farm, Average Future Year

Added Value of Production, Income		Reduced Value of Production, Income	
	$44,011		$ 0
Reduced Costs		Added Costs	
	$50,075		$33,768
Subtotal (A)	$94,086	Subtotal (B)	$33,768
		Expected Change in Profit (A–B) = $60,318	

Expected Change In Profit By Expected % Change In Yield By Expected Corn Price, 15 Inch Rows Vs. 30 Inch Rows, 1,600 Acres Of No-till Corn Grain, Western NY Study Farm, Annual

		Expected % change in yield				
		0.58	1.29	3.78	6.27	7.52
	$3.66	$20,756	$26,166	$45,298	$64,431	$73,998
Expected	$4.30	$21,524	$27,868	$50,305	$72,742	$83,960
corn price	$5.56	$23,060	$31,273	$60,318	$89,363	$103,886
per bu.	$6.82	$24,597	$34,678	$70,331	$105,984	$123,811
	$7.46	$25,365	$36,381	$75,338	$114,295	$133,774

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Final Thoughts

- Questions, Comments?
- If interested in evaluating narrow row corn grain's potential for improving results on your farm, then please see me today, or contact me jjh6@cornell.edu