6. Managing Machinery Costs in a Difficult Financial Setting

Gregg Ibendahl **<ibendahl@ksu.edu>**

Gregg Ibendahl joined the faculty in fall 2012 as an associate professor of agricultural economics with a major appointment in extension. Prior to joining the K-State faculty, he served as an associate extension professor at Mississippi State University. His specialty areas are farm management and agricultural finance. Ibendahl earned his Ph.D. from the University of Illinois in agricultural economics. He also has an MBA from Northern Illinois University. His undergraduate degree is from Southern Illinois University, where he majored in agricultural mechanization and earned a minor in computer science.

Allen Featherstone **<afeather@ksu.edu>**

Allen M. Featherstone, Professor and Head of the Department of Agricultural Economics and Director of Masters of Agribusiness at Kansas State University, holds M.S. and Ph.D. degrees in agricultural economics from Purdue University. He also holds a B.S. in agricultural economics and economics from the University of Wisconsin-River Falls. Professor Featherstone is recognized as a leading scholar in agricultural finance. His work has resulted in teaching and research awards and quotation in the Wall Street Journal, the Economist, and other publications. He served as Associate Editor for the American Journal of Agricultural Economics and on the editorial board of Choices. He has more than 120 articles published in a variety of journals. He has experience lecturing and researching in Europe, Asia, Africa, and South America.

Greg Regier **<gregier@ksu.edu>**

Greg Regier is an Extension Ag Economist with the Kansas Farm Management Association in South Central Kansas, where he assists farmers and ranchers in strategic business planning through farm and enterprise analysis and benchmarking, tax management, and business transition planning. Greg holds a B.S. in Agriculture and a M.S. in Agricultural Economics, both from Kansas State University.

Abstract/Summary

Machinery costs are one of the top expenses for Kansas farmers, increasing substantially since 2007 and representing more than one third of total costs per crop acre in 2015. In this session, we examine trends in machinery efficiency in terms of machinery cost per acre and machinery investment per acre before, during, and after the agricultural economic boom of 2007 to 2013. We also take a look at ways that producers can manage machinery costs during periods of low commodity prices, as well as financial and tax considerations of whether a producer should sell or trade old equipment, and lease or purchase new equipment. We also consider the implications of keeping older equipment for another year rather than upgrading.

Machinery Costs and Considerations

Gregg Ibendahl and Greg Regier
Kansas State University
Risk and Profit – August 2016

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Best and worst of times

- From 2007 through 2013 near record farm income (grain farms)
- Now, NFI is at levels last seen in the 1980's farm crisis
- What about Machinery?
  - Are levels appropriate
  - Can machinery be sold
  - Should machinery be kept another year
  - If I need new machinery, what are my options?

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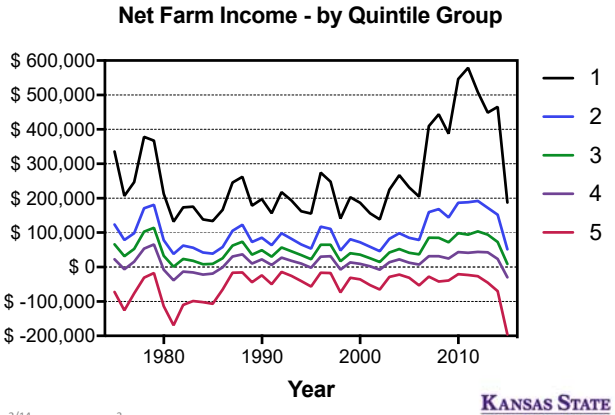
All KFMA Farms



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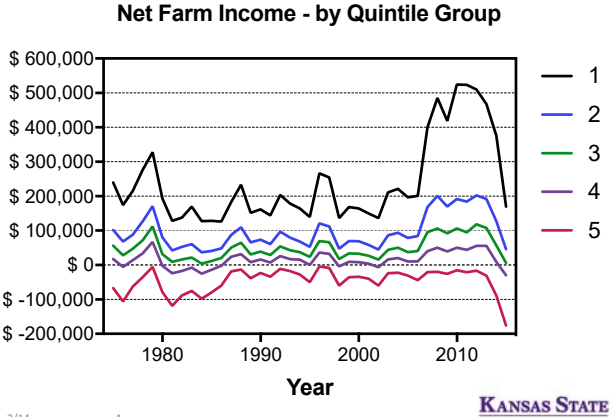
All KFMA Crop Farms



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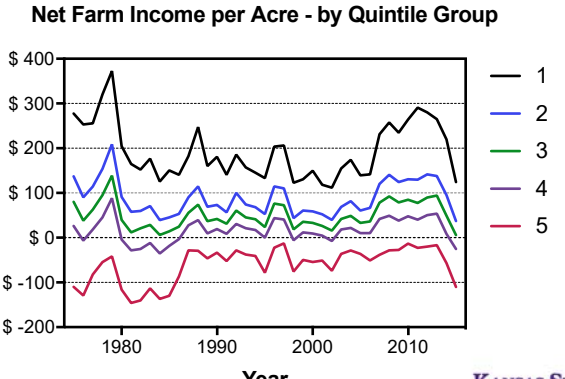
All KFMA Crop Farms (per ac)



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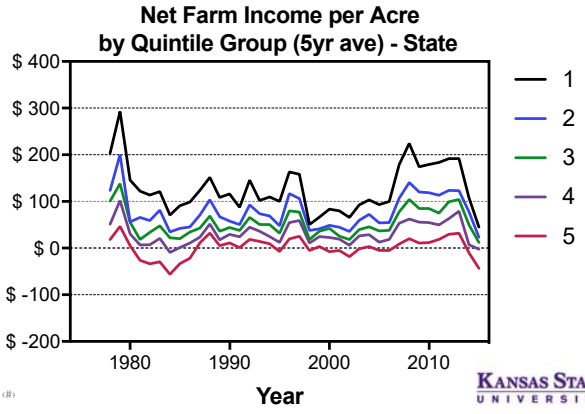
NFI per Acre – State Quintiles based on 5 Year Average



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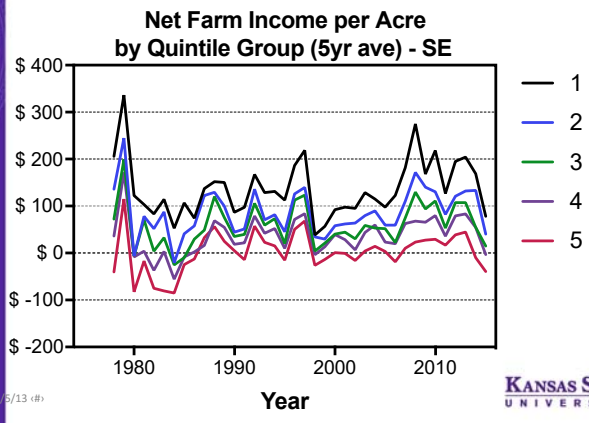
5 Yr ave Quintiles - SE



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How Has Crop Machinery Investment Changed

- How much machinery does a farm typically need?
  - Varies by region
- What happened to machinery investment during the 2007-2013 boom?
- How did farmers get through the 1980's farm crisis?

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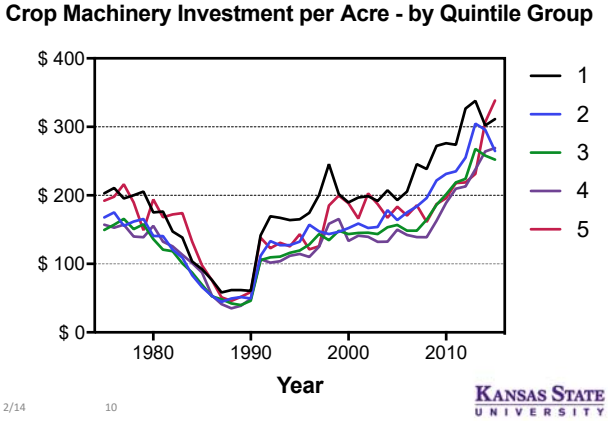
All KFMA Crop Farms



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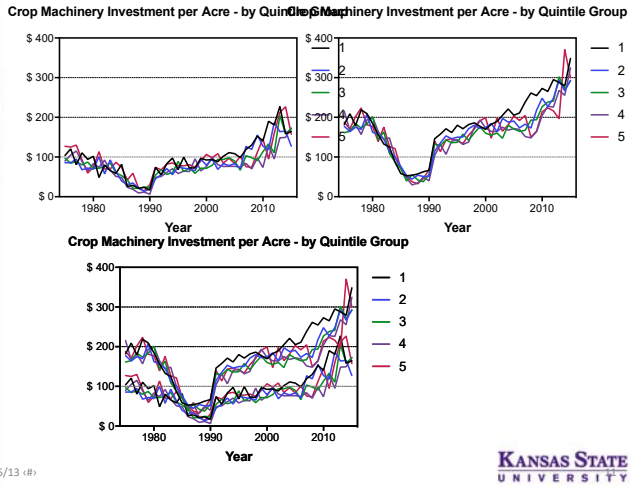
Median Crop Mach Investment per Acre – NW and SE plus overlay



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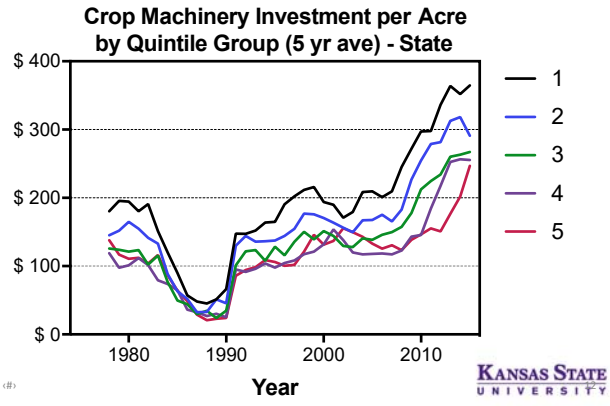
Quintiles Based on 5 yr Ave - State



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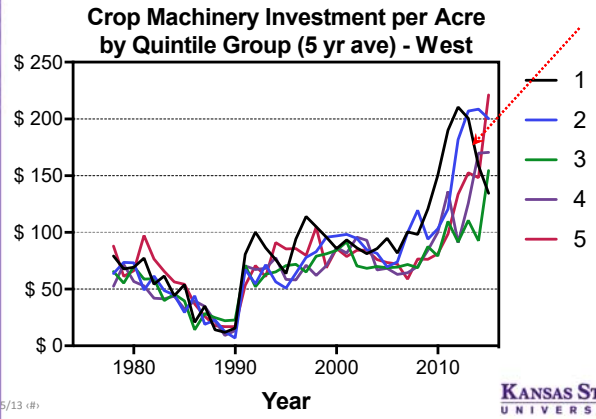
Quintiles Based on 5 yr Ave - West



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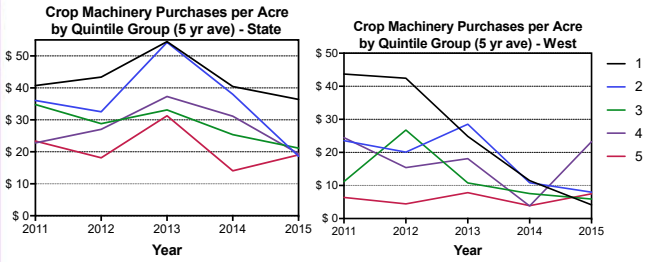
Average Machinery Purchases per acre



Is the West ahead of the curve?

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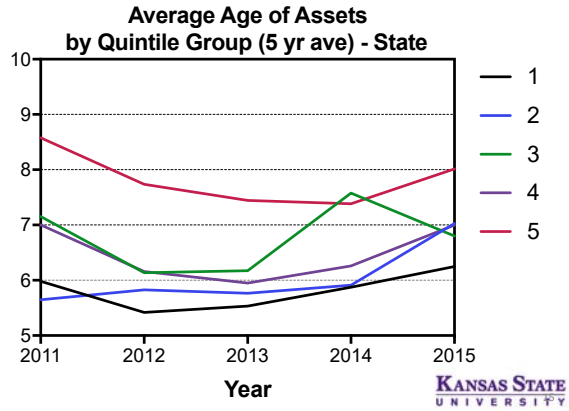
Average Asset Age



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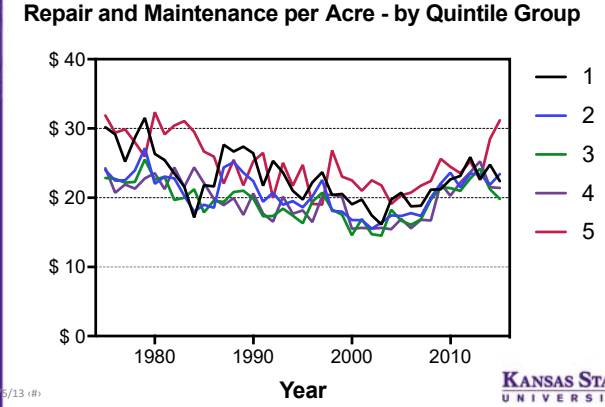
How Has Repairs and Maintenance Costs Varied?



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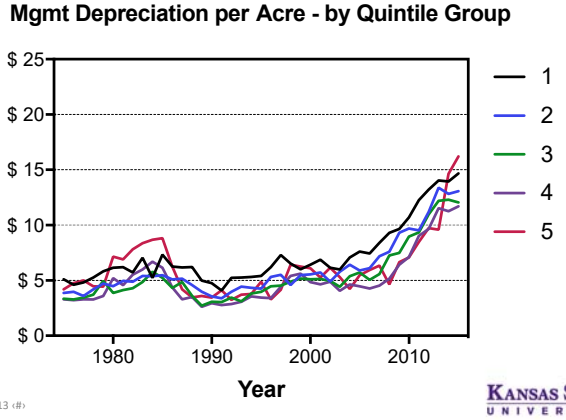
How Has Depreciation Varied?



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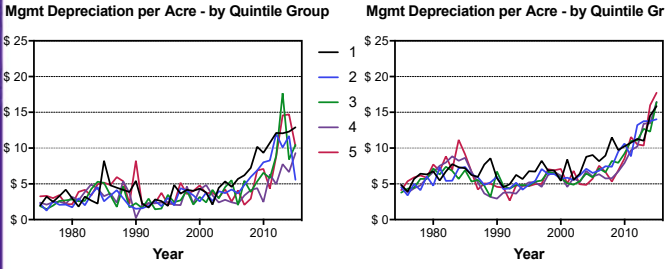
Depreciation comparison – NW and SE



The West has cut back on purchases in 2015, the rest of the state not as much

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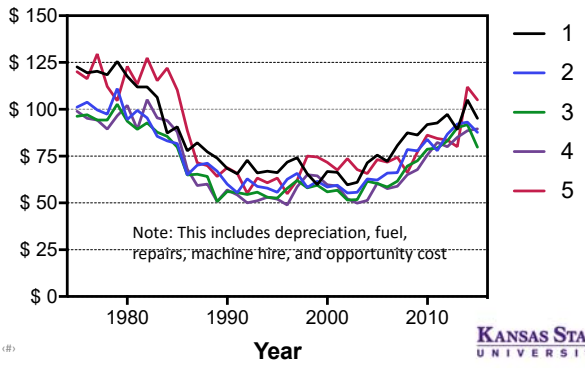
How Has Total Machinery Costs Varied?



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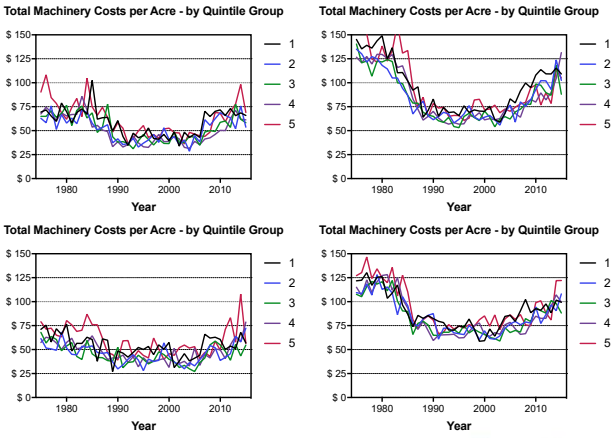
Total Machinery Costs by Region – NW, SW, NE and SE



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Should You Trade Equipment?

- Farms that made it though the financial crisis of the 1980's got by with older equipment
- The costs of new equipment must be compared to the costs of keeping older equipment for another year
  - Reliability is a big factor
  - Getting a big crop in from the field in a timely manner

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Machinery and Equipment Purchase, Sale and Trade Considerations

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Questions to Consider

- How much will it cost? (total cost *and* $/acre) Will the machine increase efficiency or profitability on my operation? Can my capital be used more profitably in other areas of my farm? (ROI)
- Can I afford it? How much capital do I need? How will it impact my working capital and cash flow?
- Are there tax advantages to owning? (Depends on your situation)

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Option 1: Purchase

- Advantages
  - Control over use of machine, easier management, timeliness
  - Generally considered less expensive in the long run
  - Tax advantages – expense up to $500,000; no SE tax when sold
- Disadvantages
  - May require more cash up front, tie up capital
  - Farmer pays for all operating expenses (labor, fuel, repairs, insurance, taxes)

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Option 2: Lease

- Advantages
  - Control over use of machine, timeliness
  - Conserves capital for other uses (lease payments may be lower than loan payments)
  - Good option for rapidly expanding business or farmer planning to retire in 3 – 5 years
- Disadvantages
  - Does not allow for the buildup of equity

Option 3: Rent

- Advantages
  - Short-term contract (hours, days, weeks, or months)
  - Low capital commitment
- Disadvantages
  - The number of rental companies might be limited

Option 4: Custom Hire

- Advantages
  - Producer not responsible for machine repairs, daily maintenance, selling machine, etc.
  - Free up time and avoid hiring part-time help
  - No long-term capital commitment
  - Ideal for specialized work
  - Know your costs in advance (no surprises)
- Disadvantages
  - Less control over timeliness and quality of work

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Lease or Purchase Example: Case IH 9230 Combine

Purchase Price	$317,500
Down Payment	20%
Interest Rate	6.90%
Loan Length (years)	5
Annual Payment	$61,782
Salvage Value (in 5 years)	$162,000
Section 179 Deduction	$500,000
Book Value (in 5 years)	$58,963

Example: Case IH 9230 Combine

Annual Insurance and Housing	$2,242
Annual Repairs	$2,540
Annual Labor	$4,112
Annual Fuel and Oil	$8,811
Total Fixed and Variable Costs	**$17,705**
Federal Tax Rate	18.0%
Self Employment Tax	15.3%
State Tax Rate	0.0%
Total Tax	**33.3%**

Purchase Case IH 9230 Combine

Cash flow is now a more important consideration

Net Cash Flows for Purchase

Year	Down/Loan Payment	Remaining Value When Sold	Repair Costs	Tax Savings or Payments	Net Cash Flow
0	$ 63,500				$ 63,500
1	61,782	$ -	$ 1,265	$ (101,356)	(38,308)
2	61,782	-	2,054	(5,999)	57,838
3	61,782	-	2,872	(5,276)	59,379
4	61,782	-	3,713	(4,495)	61,001
5	61,782	(109,274)	4,571	(3,649)	(46,570)
6	-	-	-	32,151	32,151
Total	**$ 372,412**	**$ (109,274)**	**$ 14,475**	**$ (88,622)**	**$ 188,991**

Source: Iowa State University Extension

Selling combine creates income tax

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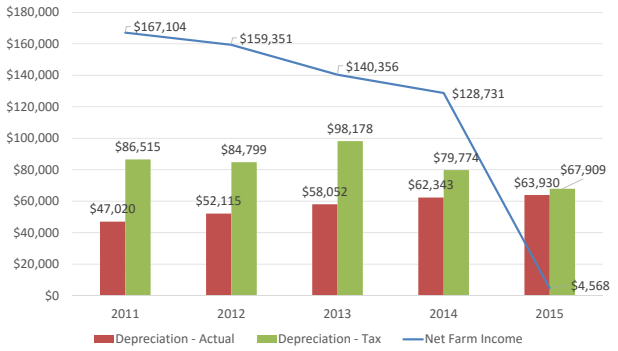
KFMA Depreciation 2011 - 2015



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Lease Case IH 9230 Combine

Net Cash Flows for Lease

Year	Lease Payments	Remaining Value When Sold	Repair Costs	Tax Savings or Payments	Net Cash Flow
0	$ 42,000				$ 42,000
1	42,000	$ -	$ 1,265	$ (13,408)	29,857
2	42,000	-	$ 2,054	(13,811)	30,242
3	42,000	-	$ 2,872	(14,063)	30,809
4	42,000	-	$ 3,713	(14,325)	31,388
5	-	-	$ 4,571	(14,593)	(10,022)
6	-	-	$ -	(1,459)	(1,459)
Total	**$ 210,000**	**$ -**	**$ 14,475**	**$ (71,659)**	**$ 152,816**

Source: Iowa State University Extension

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Purchase vs. Lease Comparison

Yearly After-tax Cash Outflows

Year	Purchase	Lease
0	$63,500	$42,000
1	-$38,308	$29,857
2	$57,838	$30,242
3	$59,379	$30,809
4	$61,001	$31,388
5	-$46,570	-$10,022
6	$32,151	-$1,459
Total cash flow	**$188,991**	**$152,816**
Present value	$169,928	$142,203
Annual cost	**$38,819**	**$32,485**

Adjustment for time value of money

Source: Iowa State University Extension

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Purchase vs. Custom Hire: 1,825 acres

Self-Propelled Harvester or Sprayer: Ownership versus Custom Hire

Ag Decision Maker -- Iowa State University Extension and Outreach

AgDM File A3-33 Combine Ownership or Custom Hire

Place the cursor over cells with red triangles to read comments.

Enter your input values in shaded cells.

Ownership Input Values

	Base Unit	Attachment or Harvesting Head			
Type of machine	SP combine	Corn	Soybeans	Wheat	Total
Purchase price or current used value of machine	$317,500				$ 317,500
Current new list price of comparable machine	$317,500				$ 317,500
Accumulated hours of use (engine)	-				hours
Current age of machine	2				years
Years of ownership remaining	5				years
		Corn	Soybeans	Wheat	
Acres of your own crop harvested or sprayed annually		650	325	850	1,825
Acres harvested or sprayed for others annually,custom hire		-	-	0	-
Acres harvested or sprayed per hour	Click for typical values	9.7	12.9	12.9	acres/hour
Fuel used, gallons per acre	Click for typical values	1.45	1.00	1.00	gallons/acre
Price of fuel, $ per gallon	$2.50	/gallon			
Interest rate for machinery investment	6.90%				
Machinery labor rate, $ per hour	$18.00	/hour			
Hours of labor needed for hauling, drying, storing	150	hours			

Source: Iowa State University Extension

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Purchase vs. Custom Hire: 1,825 acres

KSU 2016 Custom Rates based on yield

Total cost per acre including base unit	**$45.58**	**$34.00**	**$34.02**	**$38.09**
Total cost including labor for hauling, drying, & storing	$47.35	$35.32	$35.34	$72,222
Custom hire income received				$0
Total cost minus custom hire income				**$72,222**

Custom Hire Input Values

Input Data		Corn	Soybeans	Wheat	Total
Custom hire charge per acre		$34.17	$27.67	$28.44	
Extra (+) or reduced (-) field loss from custom harvesting, %					
Expected yield, bu. per acre *(leave blank if no field loss)*		95	28	50	
Expected price, $ per bu. *(leave blank if no field loss)*		$3.30	$10.25	$4.15	
Value of extra or reduced yield		$0	$0	$0	$0
Hours of labor needed for hauling,drying,storing	150	$1,146	$427	$0	$1,573
Custom hire charge		$22,211	$8,993	$24,174	$55,377
Total annual cost for custom hiring		$23,356	$9,420	$24,174	**$56,951**
Total cost per acre for custom hiring		$35.93	$28.99	$28.44	$31.21

Comparison

Added savings (+) or cost (-) for ownership	Custom hire is less costly.	($15,272)
Minimum acres of own crops to break even on ownership		2,453
Minimum acres of custom work needed to break even on ownership, if any		-

Source: Iowa State University Extension

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Alternative 1: Joint Ownership

- Must reach agreement
  - Work habits and care of the machine
  - Scheduling
  - Labor and repairs – who is responsible?
- Written agreement to dissolve
  - Disagreement
  - Termination from farming by one party (retirement, death, expansion)
  - Method to determine machine's value

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Alternative 2: Rent Out Machinery

- Generates additional revenue
- Spreads machinery costs over more acres
- Works best to rent outside of local area (when you don't need the machine)

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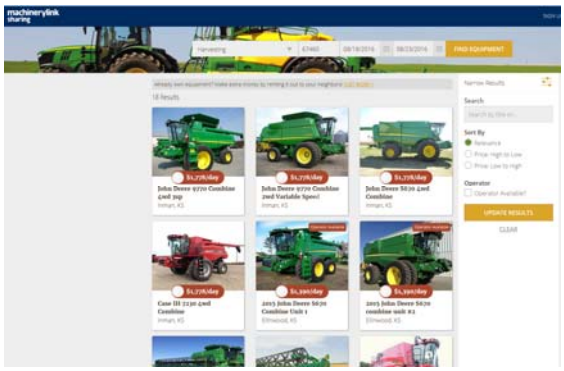
MachineryLink Sharing



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Machinery: sell or trade?

- Selling *may* have both tax and financial advantages
- Trading is generally more convenient
- Dealers have excess inventory
- Example: Farmer currently owns a tractor valued at $60,000 and wants to upgrade to a $90,000 tractor

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Net Tax Savings: $8,478

	Trade in old tractor	Sell old tractor
Income reported on 4797	***$0***	***$60,000***
Federal income tax (15%)	$0	$9,000
Self employment tax	$0	$0
Total taxes paid	$0	$9,000
Expense reported on Schedule F	***$30,000***	***$90,000***
Federal income tax saved (15%)	$4,500	$13,500
Self employment tax	$4,239	$12,717
Total taxes saved	$8,739	$26,217
Net tax reduction	***$8,739***	***$17,217***

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Lance Sexton @lance_sexton · Aug 12

When you tell the @180YieldFailure operator to fill the trucks full and increase efficiency.

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Thank you! Questions, comments?

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