

4. Replacing Farm Equipment

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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.

Abstract/Summary

Machinery costs are one of the top expenses for Kansas farmers and typically represent more than one third of total costs per crop acre. In this session, we examine machinery replacement strategies for those farms who own their own farm equipment. In particular, we examine the effects on net farm income and cash flow from these various strategies. Most farms practice the strategy of buying more equipment during good years but then not purchasing as much during low profitability years. We compare this choice to others to see if this has been the best approach for farmers. During times of low farm profitability, when lenders may be reluctant to lend, devising a strategy that provides adequate cash flow may help farmers survive until profitability improves.



Managing Machinery Expenses

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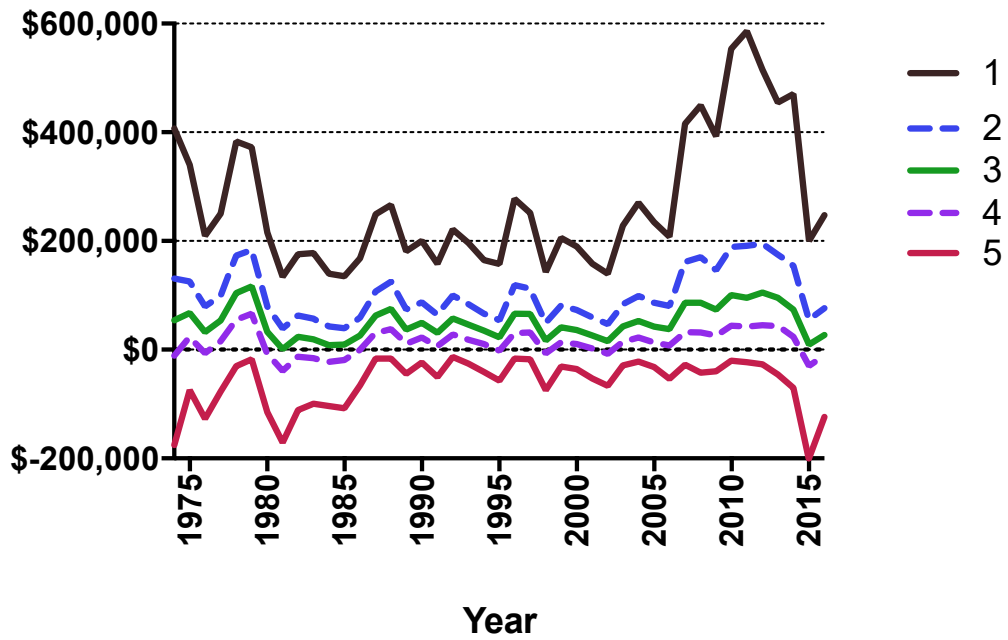


How bad has NFI been?

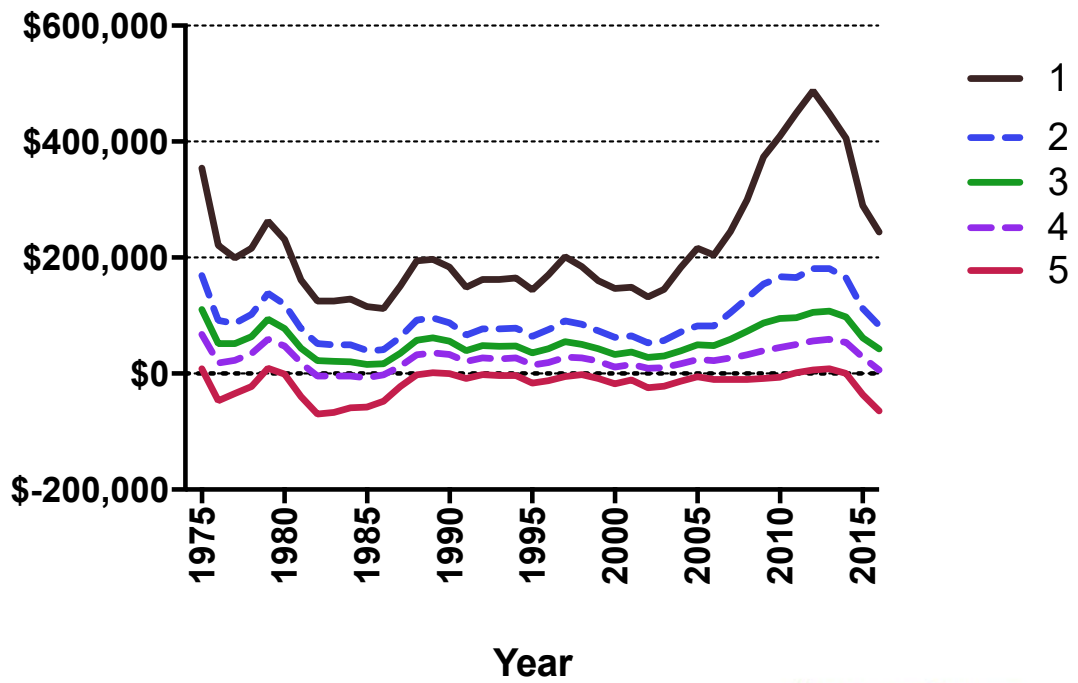
- Nearly every year some farms lose money
 - Weather
 - Prices (inventory changes)
- Usually most farms break even longer term
- Different now
- Varies by region

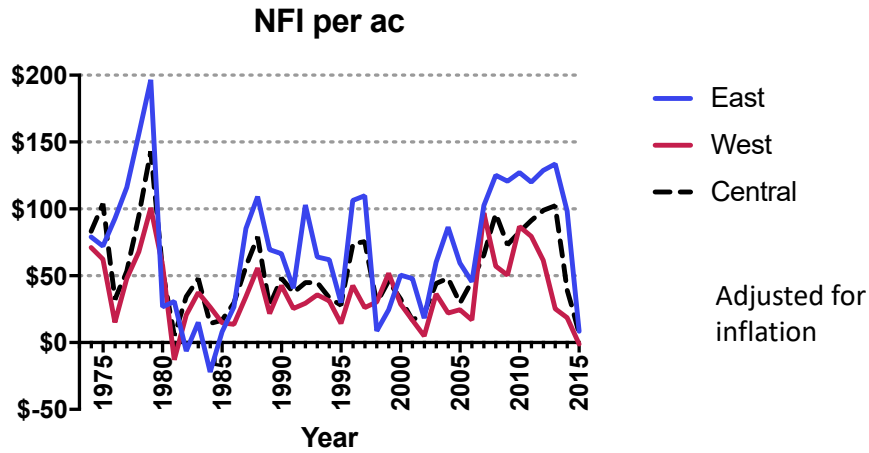


Average NFI by Quintile



3 Year Average NFI by Quintile





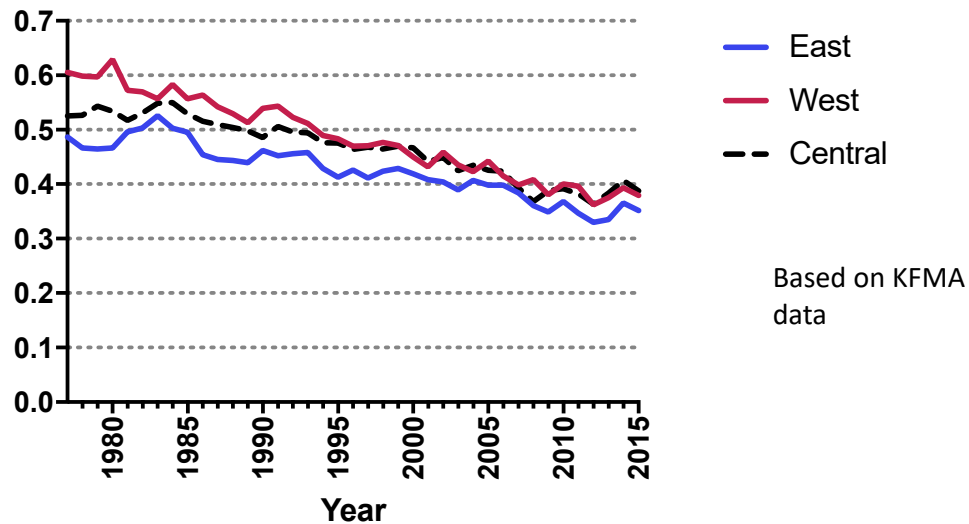
- Net Farm Income similarities to the 1980's farm crisis
 - High NFI in the years preceding the downturn
 - The downturn was quick to happen
 - NFI per acre was negative for a few years
 - The Western part of the state experience problems first



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?

Machinery costs as a percent of total costs

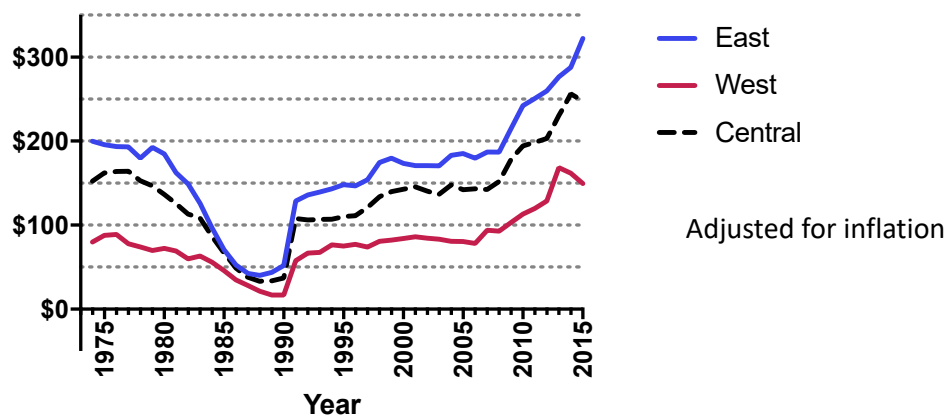


- Machinery costs as a percent of total costs have declined
 - No till
 - Size advantages
 - Better machinery technology
 - GMOs
- Still, machinery expense 35-40% of total costs

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How did we get through the 80's farm crisis?

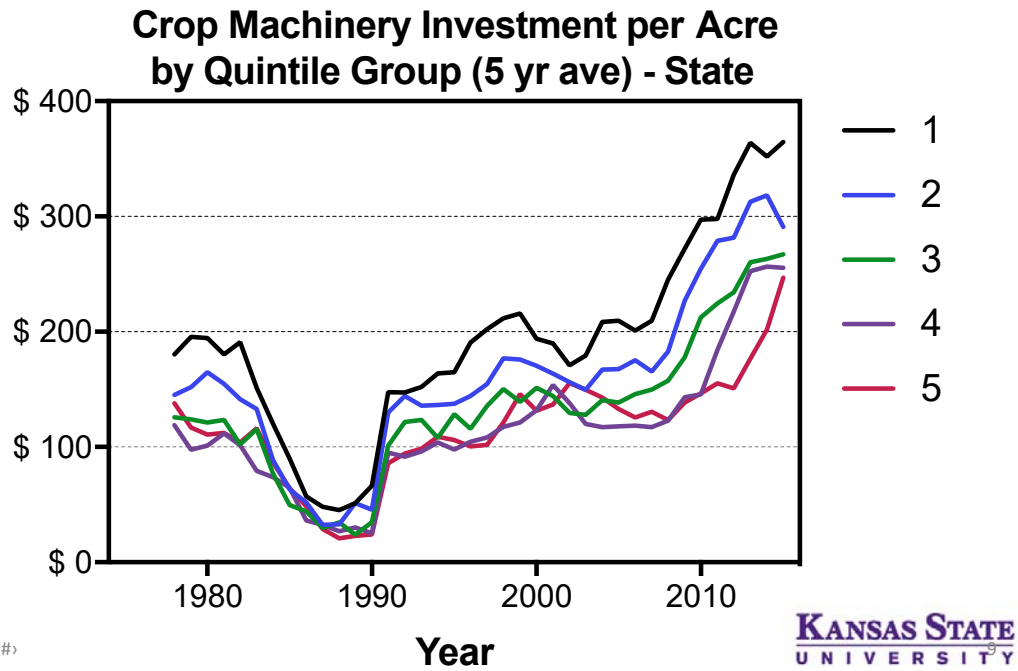
Machinery investment per acre



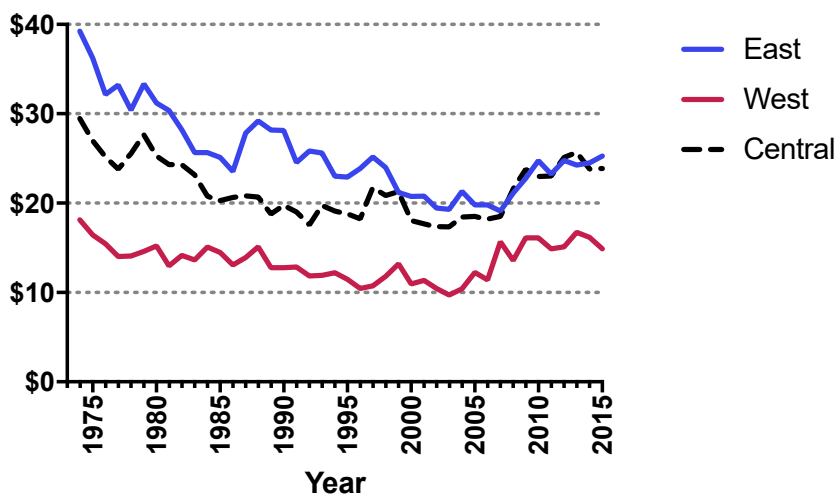
- Farmers quit buying machinery during 1st farm crisis
 - Farmer's choice or lender's requirement?
 - By 1989, machinery investment was only 25% of pre-crisis level
- Recovery of machinery investment by early 1990's
- Newer or additional machinery added started in 2007
- Machinery reserve?

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Quintiles Based on 5 yr Ave - State



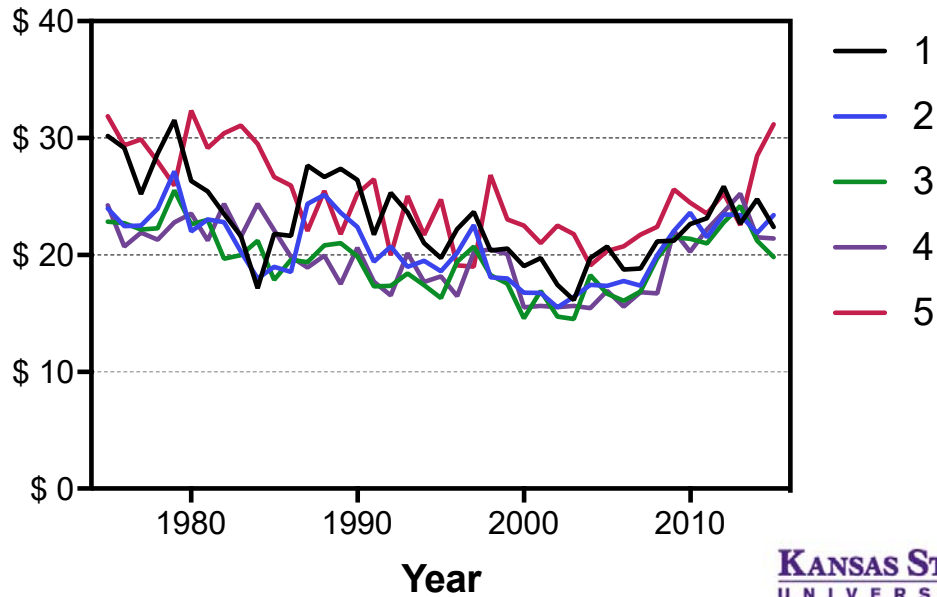
Repairs per acre



- Lack of purchases during 1980 crisis did not lead to greater repairs
 - More repairs done on farm?
 - Are on-farm repairs possible today?
- Gradual decline in repairs per acre until 2007

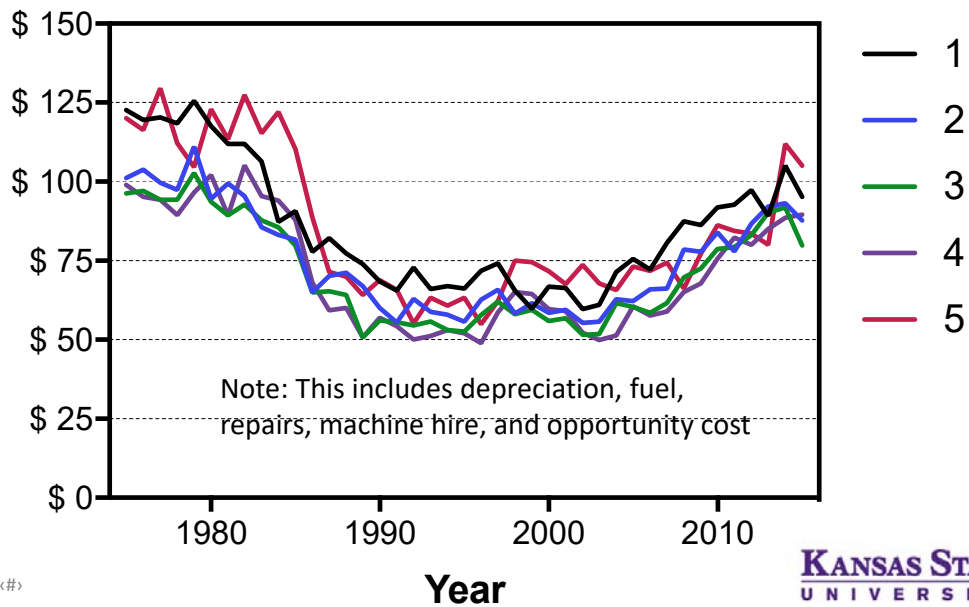
How Has Repairs and Maintenance Costs Varied?

Repair and Maintenance per Acre - by Quintile Group



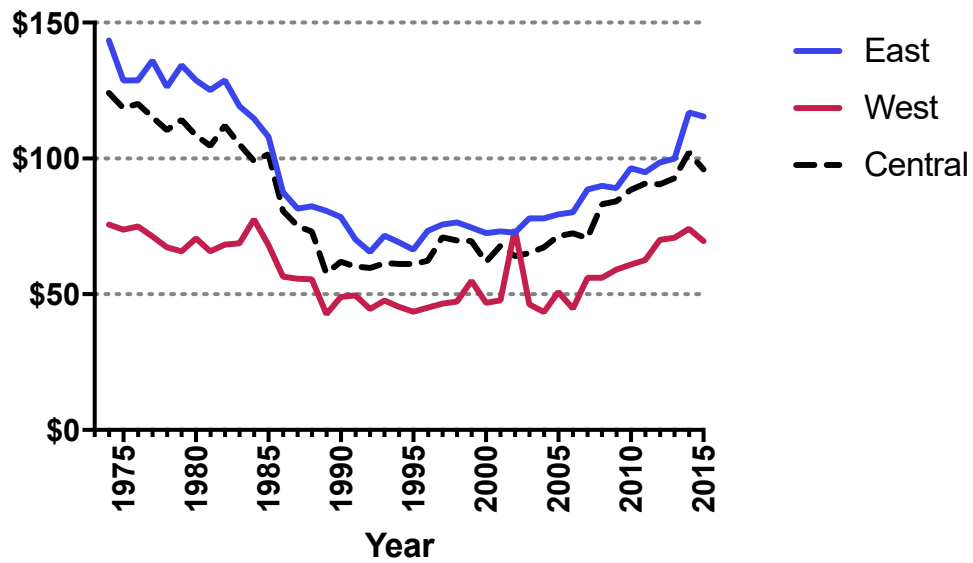
How Has Total Machinery Costs Varied?

Total Machinery Costs per Acre - by Quintile Group



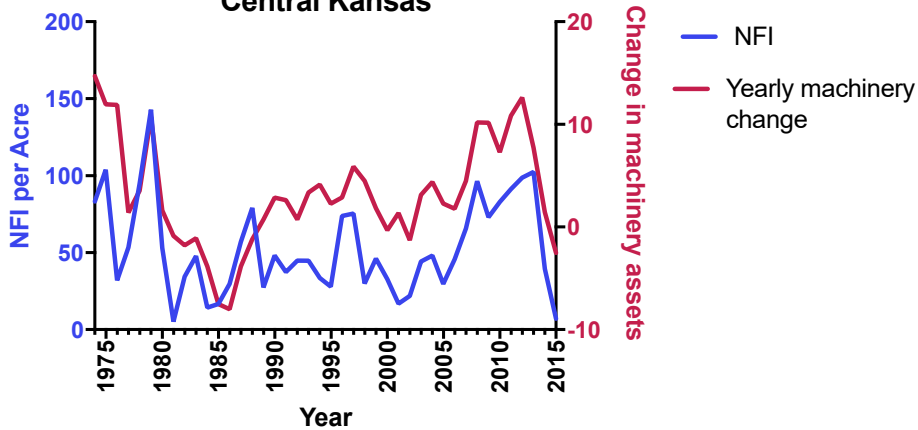


Total machinery cost per acre



Strong correlation between NFI and machinery purchases

Comparison of NFI and changes in machinery
Central Kansas



- 0.69 correlation
- No indication of any lag
 - Farmers react quickly to changes in NFI when making machinery purchase decisions
 - Trying to take advantage of 179 depreciation?



Purchase Options for Machinery

- Replace at cost minimization point
- Replace frequently
- Replace something every year
- Replace when cash is available
- Keep it forever



Reason to Replace (cont)

- Other
 - Pride of ownership
 - New technology
 - Need for capacity

Purchase factors

- 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)

Reason to Replace (cont)

- Reliability
 - Previous cost minimization left this out
 - Ability to get crop planted or harvested at the optimal times
 - Small harvest windows
 - Weather damage the longer crop stays in the field
 - Difficult to measure
 - Intuition?



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)
- What about reliability and timeliness?



First, Make Sure Equipment is Running Well



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Reasons to Replace

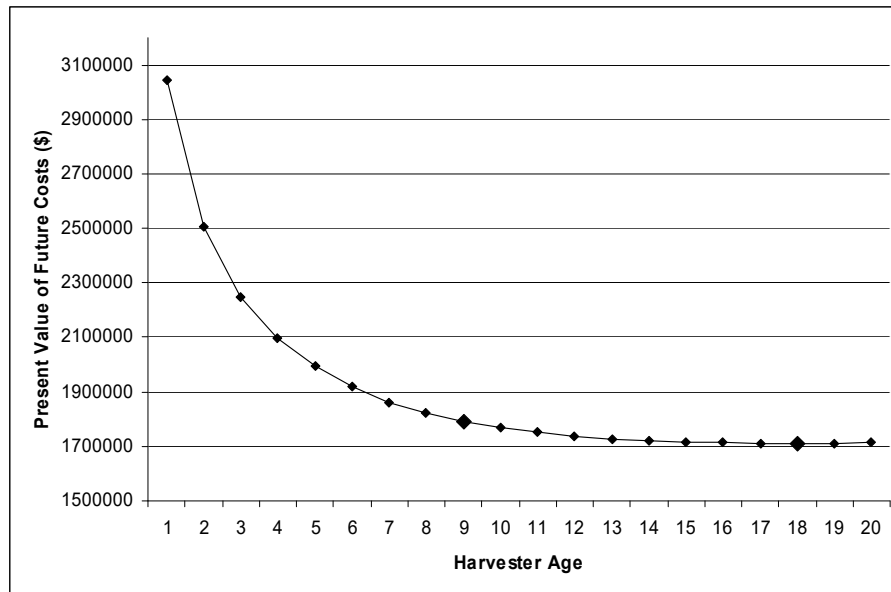
- Cost minimization
 - Rule of thumb: Replace when the annualized total cost of owning and operating the machine begins to increase
 - i.e., Depreciation and interest decrease over time while repairs increase and fuel costs stay constant
 - Models are very sensitive to estimates
 - Requires some knowledge of future repairs
 - Typical curves are very flat
 - i.e., wide possible range of replace ages

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Example of cost minimization



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Replacement Strategies

- Replace frequently
 - More reliable equipment
 - Equipment under warranty
- Replace something every year
 - Evens out equipment spending
 - May reduce borrowing needs
- Replace when cash is available
 - Levels out NFI
 - Difficult to predict

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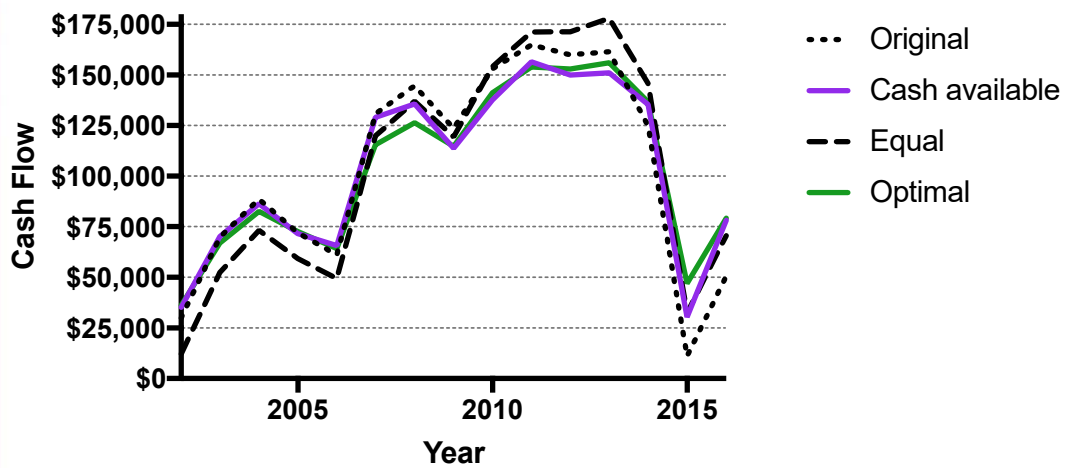
Replacement Strategies (cont)

- Keep it forever
 - May be least costly option
 - May be best for cash flow
 - Reliability becomes a factor
 - Need for backup equipment
 - Sacrificing latest technology

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Figure 1. Comparison of Purchase Strategies



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Selling Farm equipment

- Book value vs Market value
- Recapture of depreciation
- Tax consequences

Summary –

Considerations for farmers for the next few years

- Many farmers built up a “bank” of machinery
 - Time to draw down these reserves
 - Reducing machinery investment per acre by 50% would put farms inline with historical norms
- Proper maintenance can help reduce field loses as well as reduce repairs
- When equipment is needed, analyze all options for impacts to profitability as well as cash flow.

Questions or comments?

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