



# What Makes a Top Farm

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Ag Lenders Conference

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## Background

- Motivation came from your questions from last year
  - Last year – ROA > ROE could be predictor of farm delinquency rates
  - Could we determine why some farms do better than other farms
  - Current series of papers on what makes a top farm

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## Issues with identifying top producers

- NFI is correlated to the size of farm
- A single year's worth of data is greatly affected by the weather conditions of that year
  - Weather effects all farms within a region
  - Individual farm affects
- Same with crop prices
- Regional differences in Kansas

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## Our approach

- Use of a 10-year panel of grain farms
  - Helps control for affects of yields and prices from a single year
  - 398 farm
- Dividing farms into 3 regions
  - 186 East, 167 Central, 45 West
- Use of NFI per acre
  - Controls for farm size

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# What is unique in our approach

- Use of farm ranking instead of a dollar measure.
  - Rank each farm within a region from 1 to # of farms for each year (i.e. in 2008, a rank of 1 to 186 in eastern KS) based on NFI per acre for that year.
  - Average the 10 farm rankings to get an overall ranking.

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# Desired Distribution

**Histogram of East KS - Distribution of Farm Rankings**

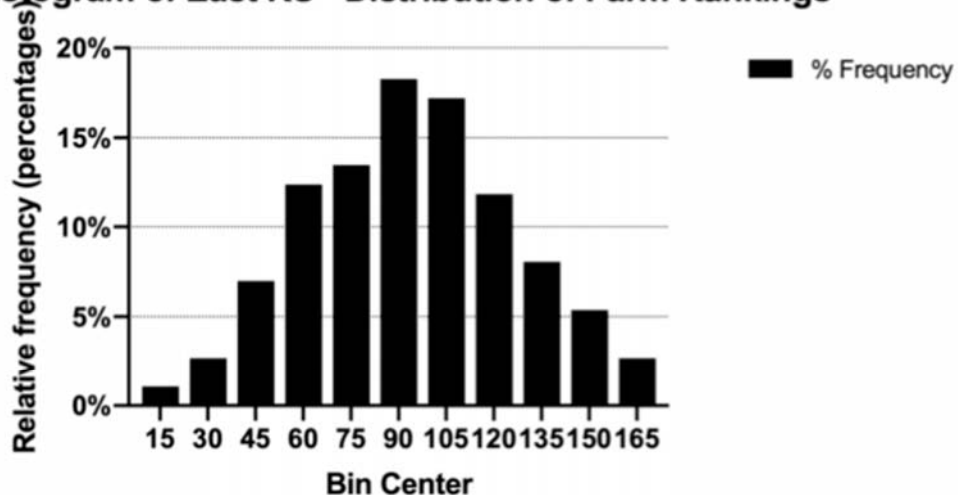


Figure 1. Histogram of Farm Rankings for East KS

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# Comments of distribution

- Those farms at top end consistently ranked near the top each year
- Those farms in the middle either:
  - consistently ranked near the middle or
  - were good in some years and bad in other years to get an average ranking in the middle
- Those farms at the bottom were consistently ranked near the bottom each year

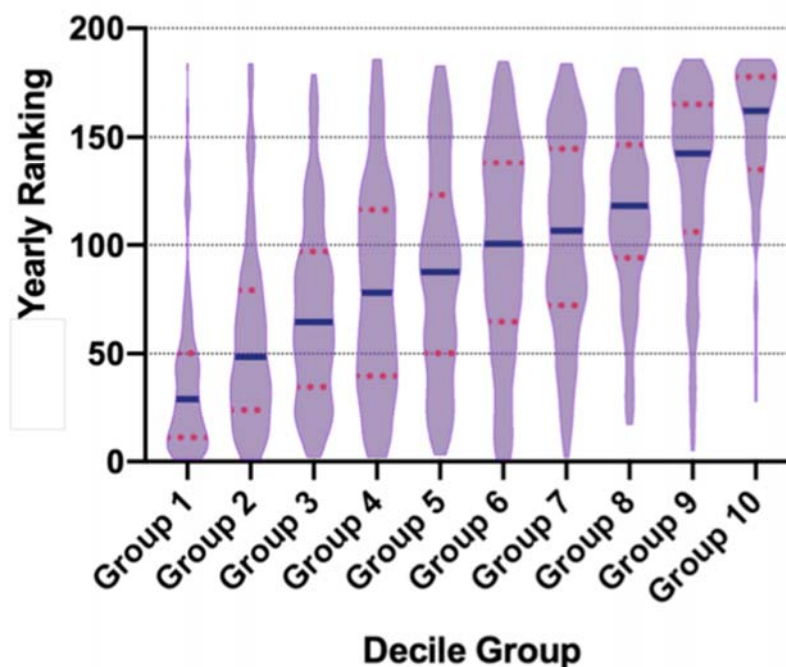
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# Use of violin graphs

## Yearly Farm Rankings by Decile - East

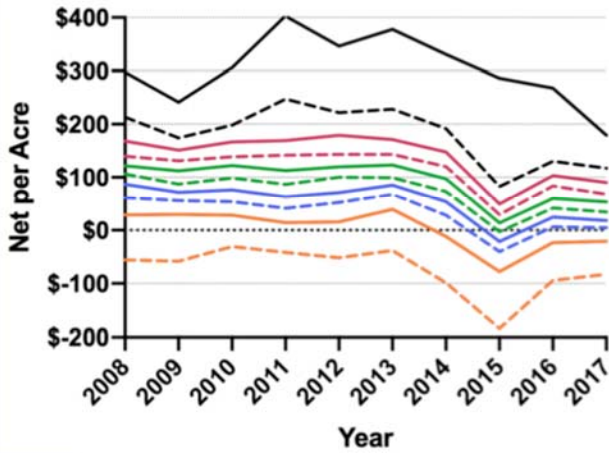


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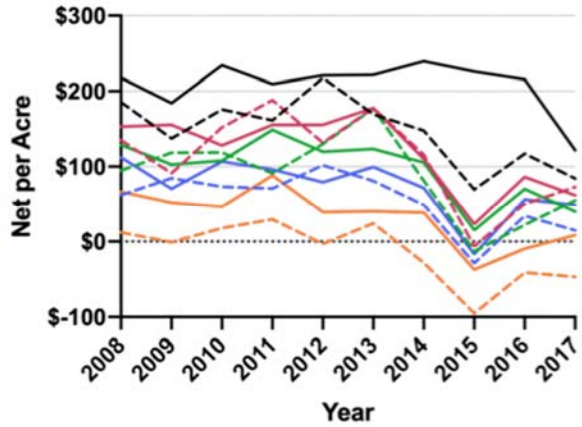
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Comparison of ranking by groups each year vs what we did in the paper (i.e. groups on average of 10 year rankings)

Net per Acre - East - Group by Year



Net per Acre - East - Group by 10 yr ave

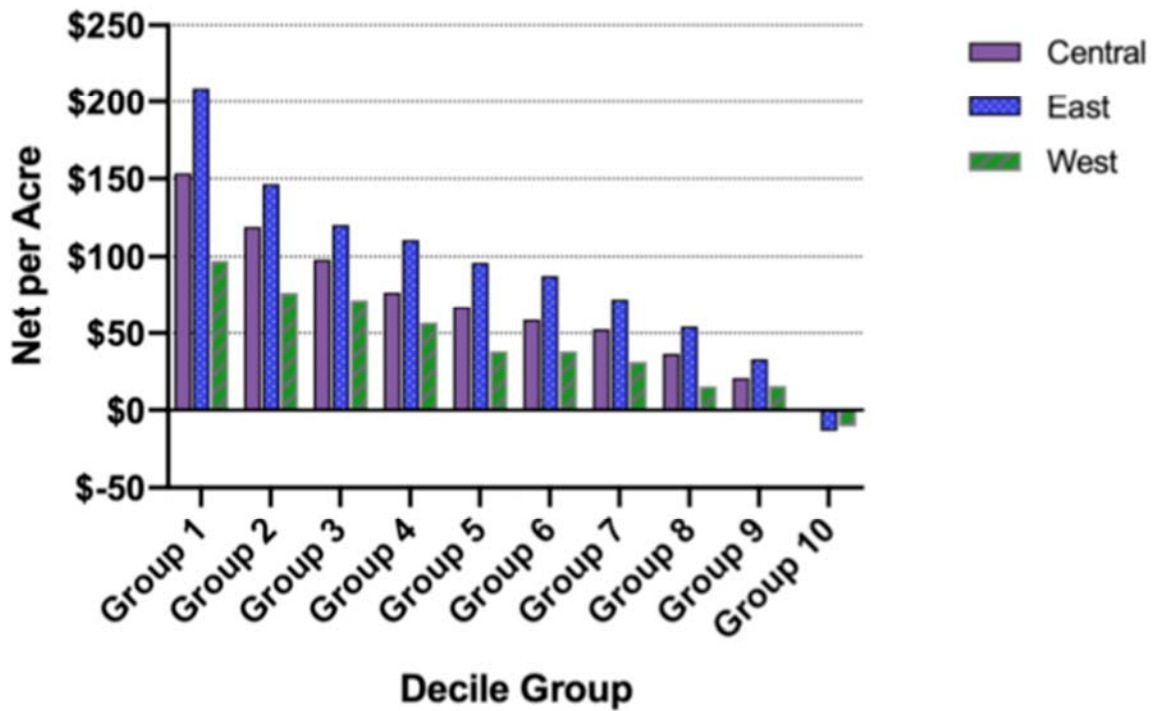


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2016.1



Ave Net per Ac by Decile



# Factors we have examined

- Farm size
- Debt level
- Machinery investment
- Machinery cost
- Acreage allocation

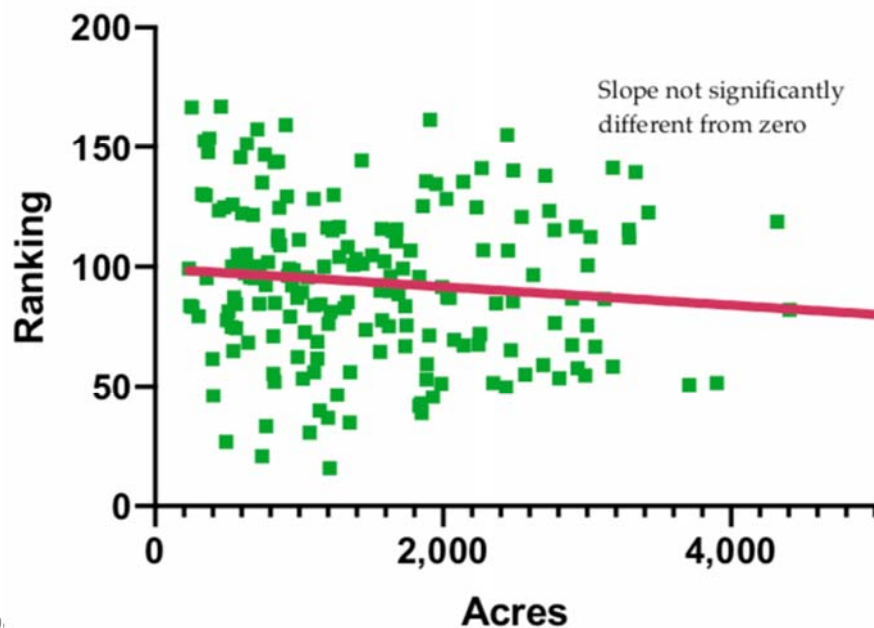
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## Farm size - East

### Scatterplot - Crop Acres (East)



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# Farm Size distribution

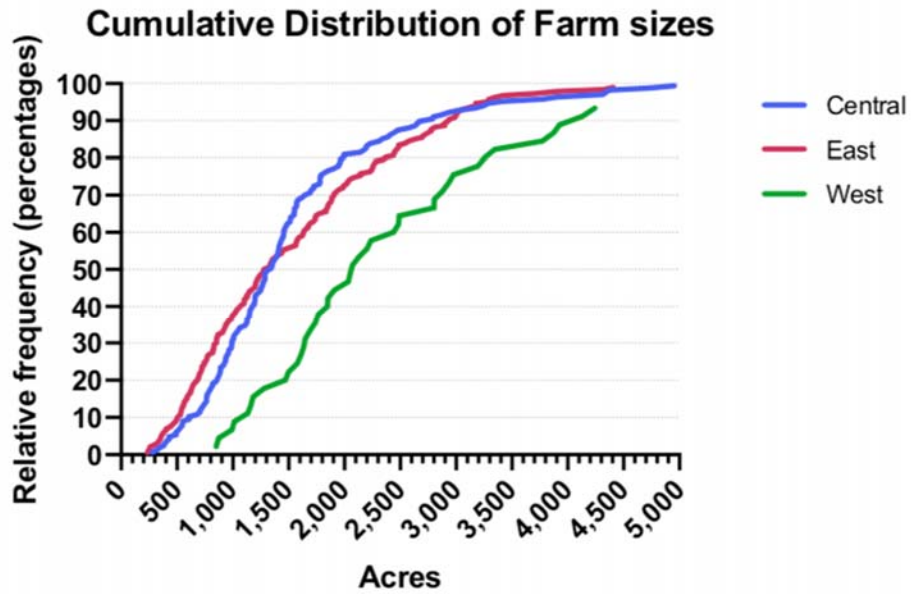


Figure 4. Cumulative Distribution of Farm Sizes by Region

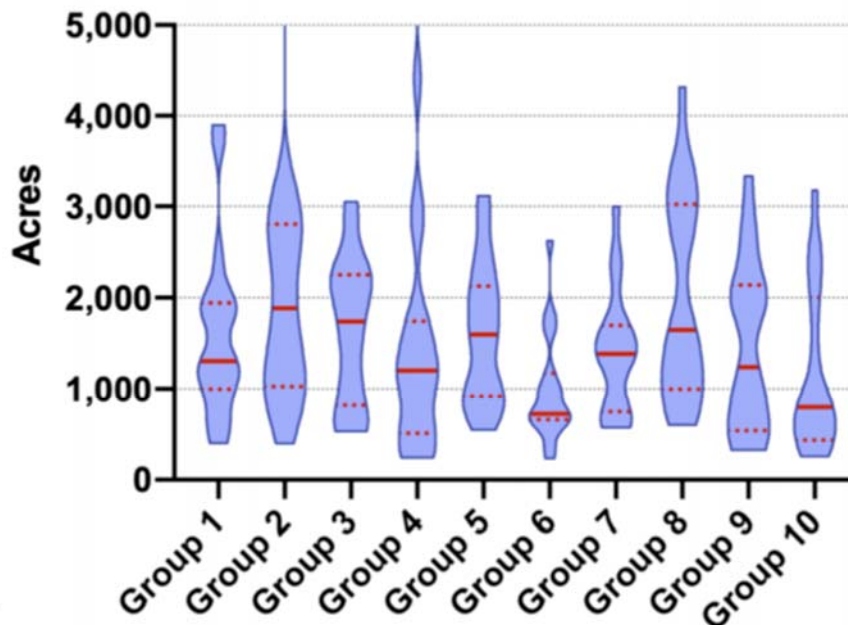
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# Violin plot of farm size

## Violin Plot of Crop Acres by Decile (East)



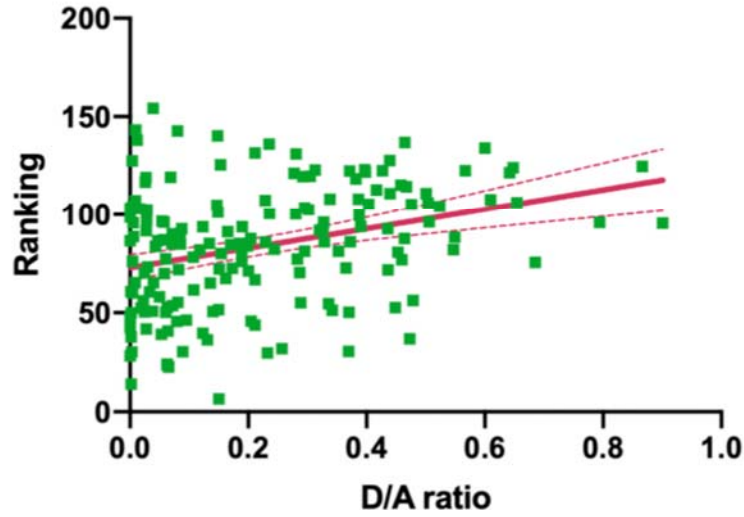
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# Debt level – Central

### Scatterplot - D/A ratio (Central)

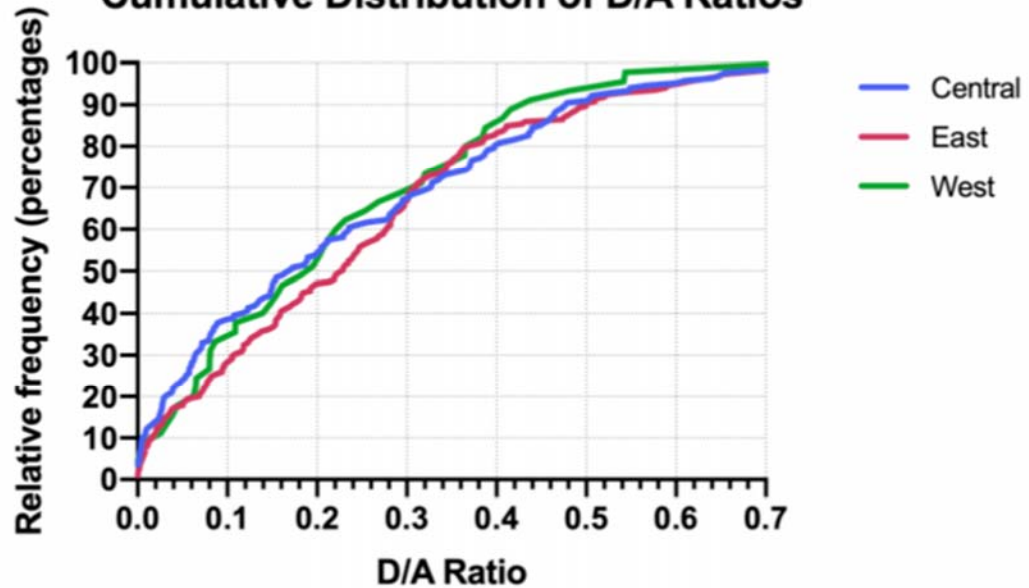


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# Wide distribution of D/A ratios

### Cumulative Distribution of D/A Ratios



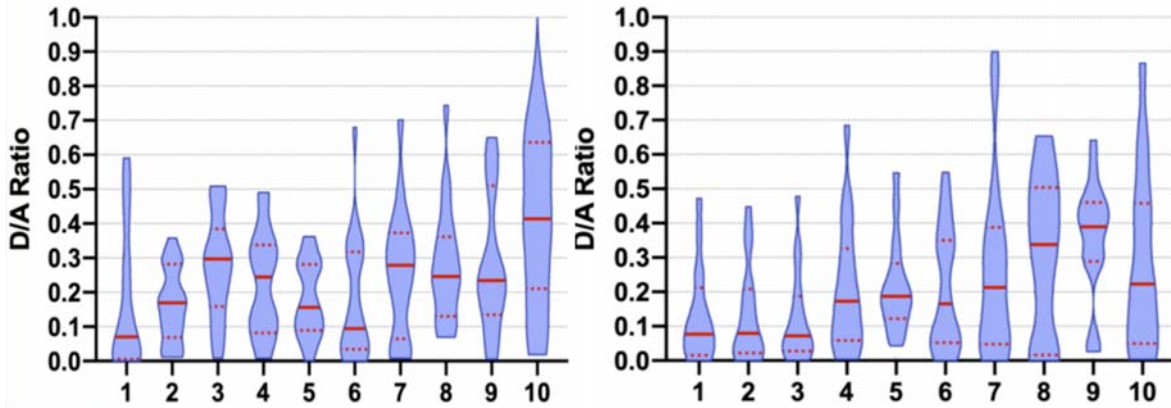
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# Contrast in regions for Debt

Violin Plot of D/A Ratio by Decile (East)      Violin Plot of D/A Ratio by Decile (Central)



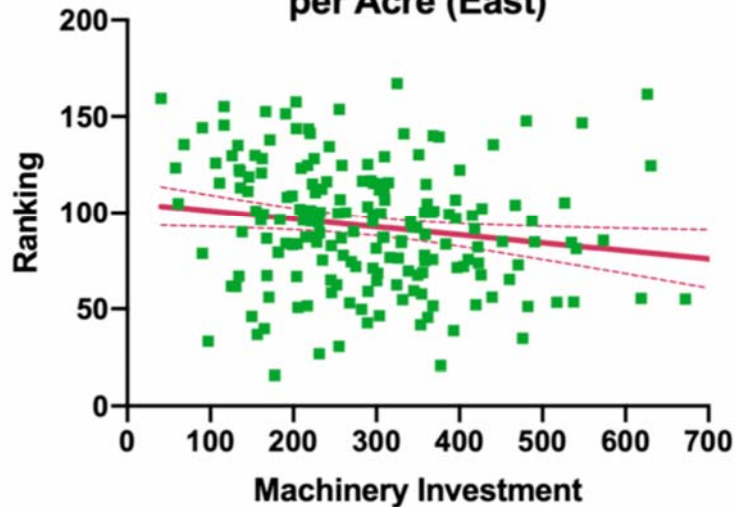
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# Machinery investment-East

Scatterplot - Machinery Investment per Acre (East)

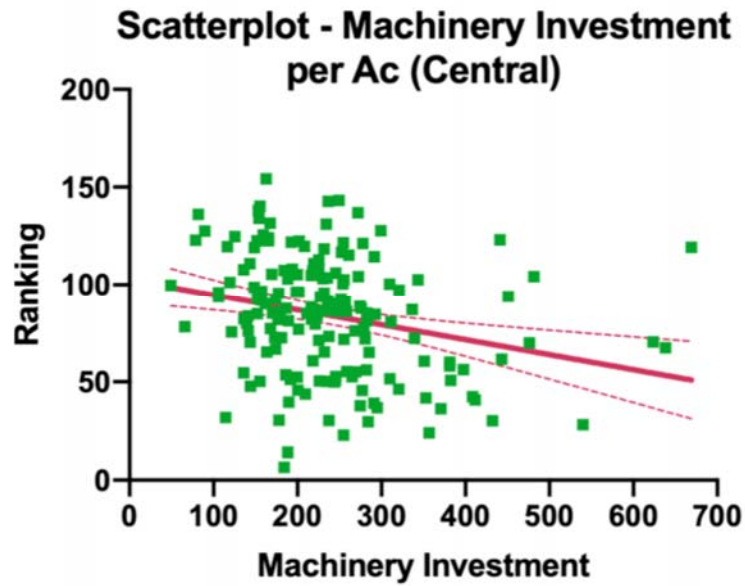


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# Machinery investment - Central



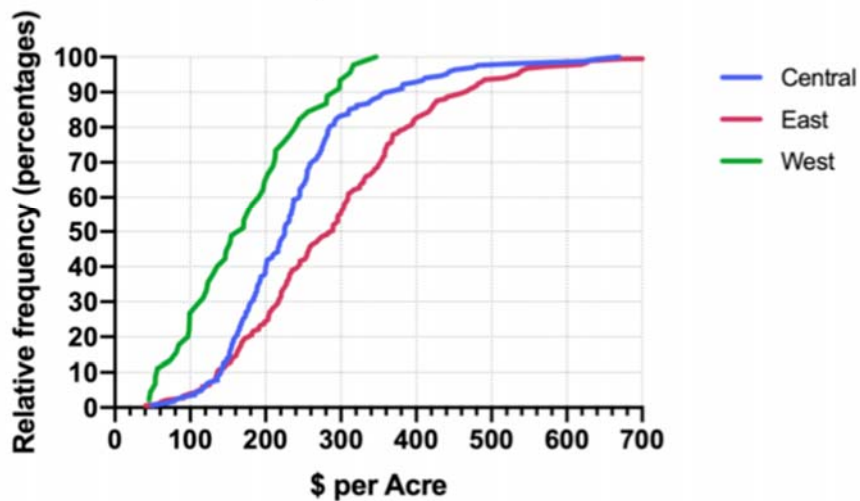
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# Distribution of machinery investment

**Cumulative Distribution of Machinery Investment per Acre**

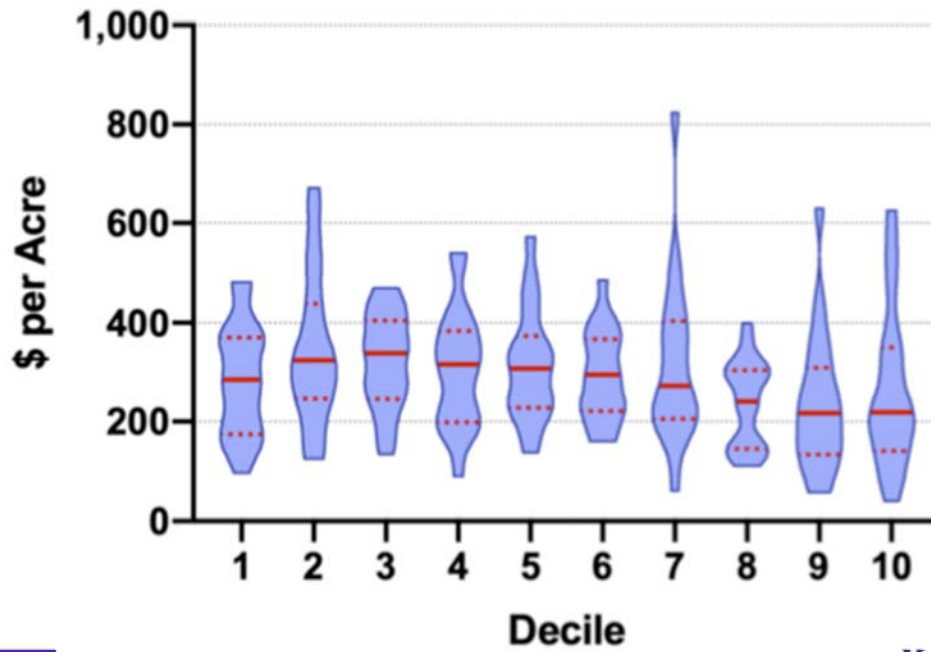


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## Violin Plot of Machinery Investment by Decile (East)

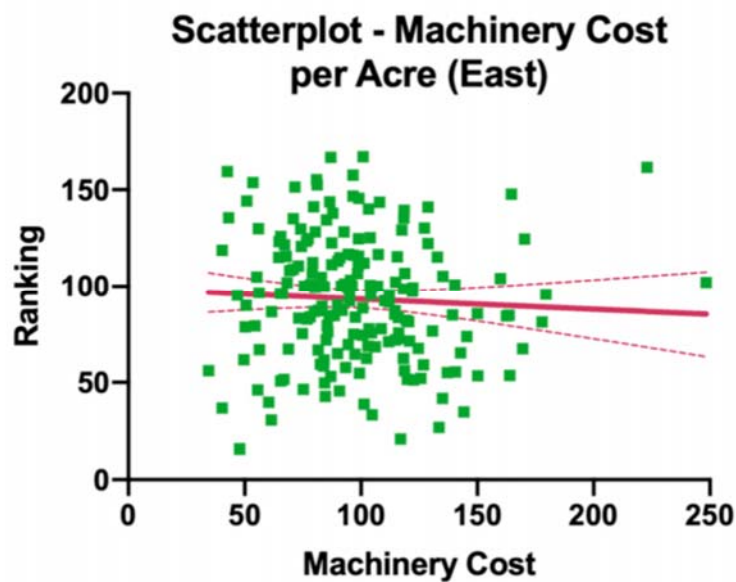


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## Machinery cost



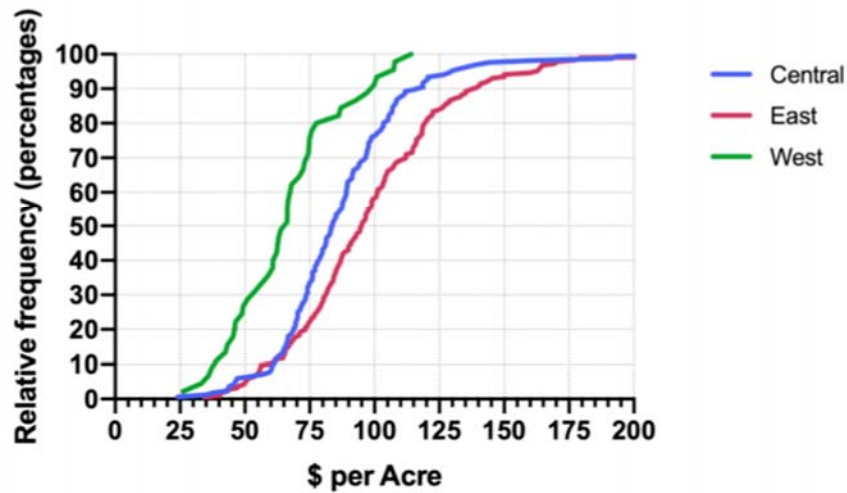
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# Distribution of machinery cost

## Cumulative Distribution of Machinery Cost per Acre

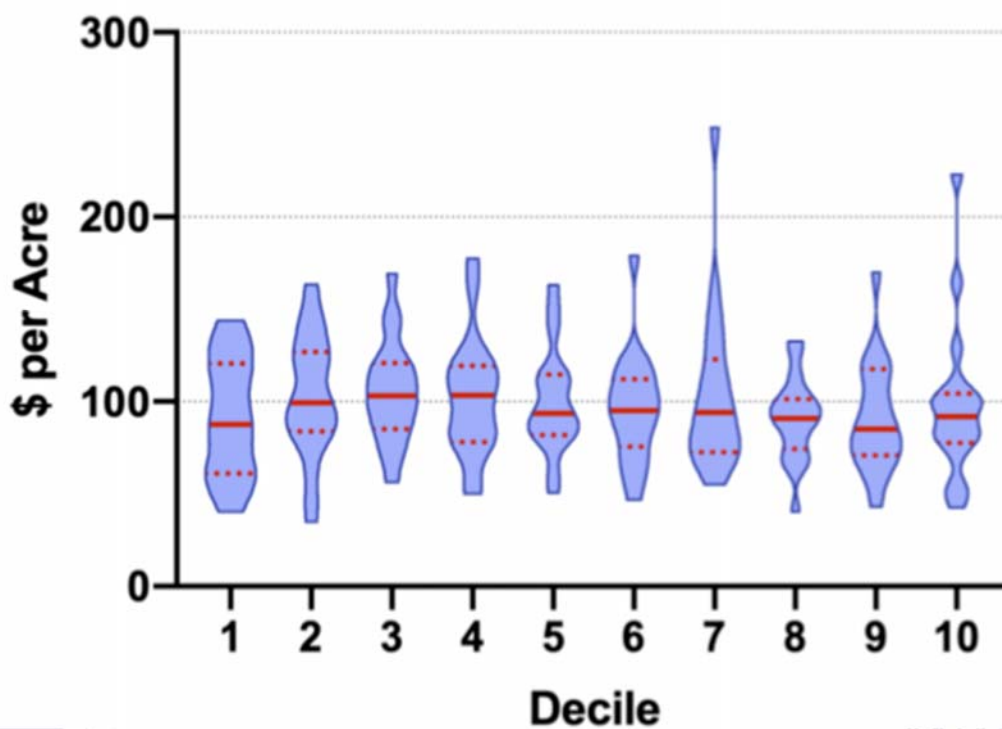


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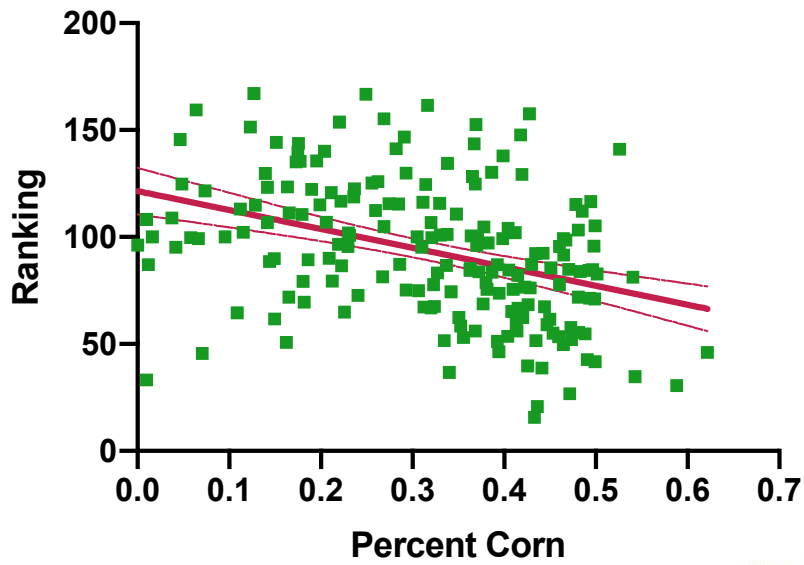
## Violin Plot of Machinery Cost by Decile (East)



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# Crop acre allocation

## Scatterplot - Percent Corn Acres (East)



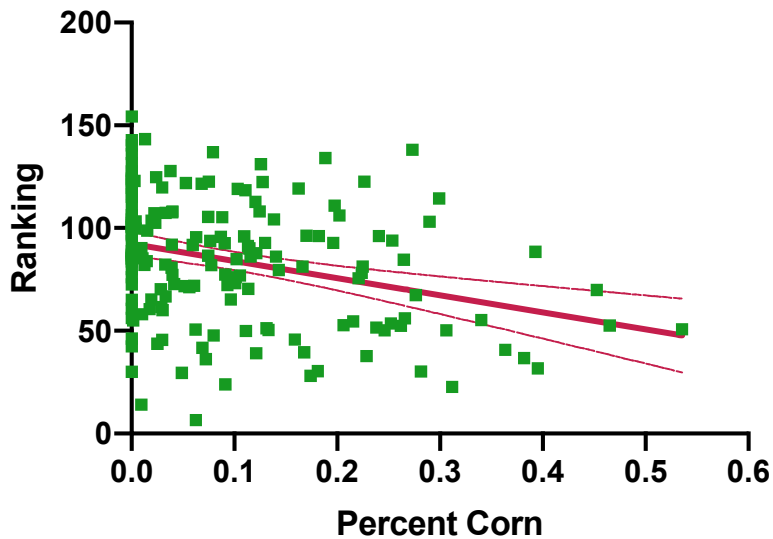
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# Crop acre allocation

## Scatterplot - Percent Corn Acres (Central)



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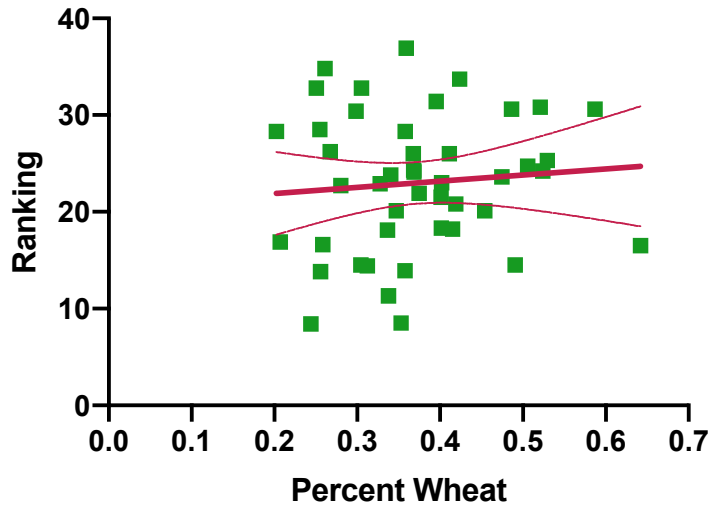
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# Wheat acres

### Scatterplot - Percent Wheat Acres (West)



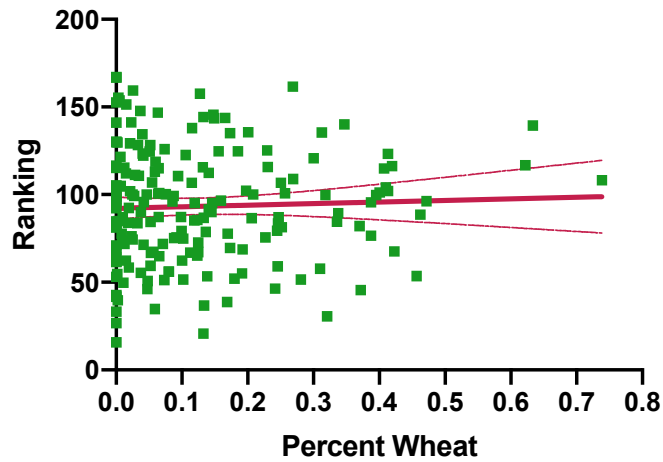
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# Wheat acres

### Scatterplot - Percent Wheat Acres (East)



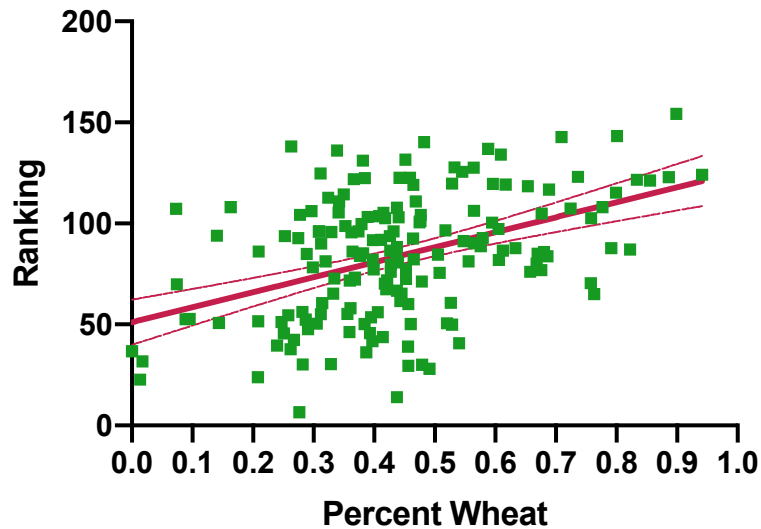
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# Wheat acres

Scatterplot - Percent Wheat Acres (Central)



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# Papers to be written

- % rented land
- Farmer age
- Current ratio
- Crop yields
- Total capital managed
- Fertilizer cost
- Crop insurance – both cost and receipts
- Total crop production costs

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# Thank you!

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