JOHN DEERE

The Promise of Abundant, Sustainable Agriculture

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TECHNOLOGY EVOLVES

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TECHNOLOGY EVOLVES

1956 IBM HARD DRIVE

5MB OF STORAGE

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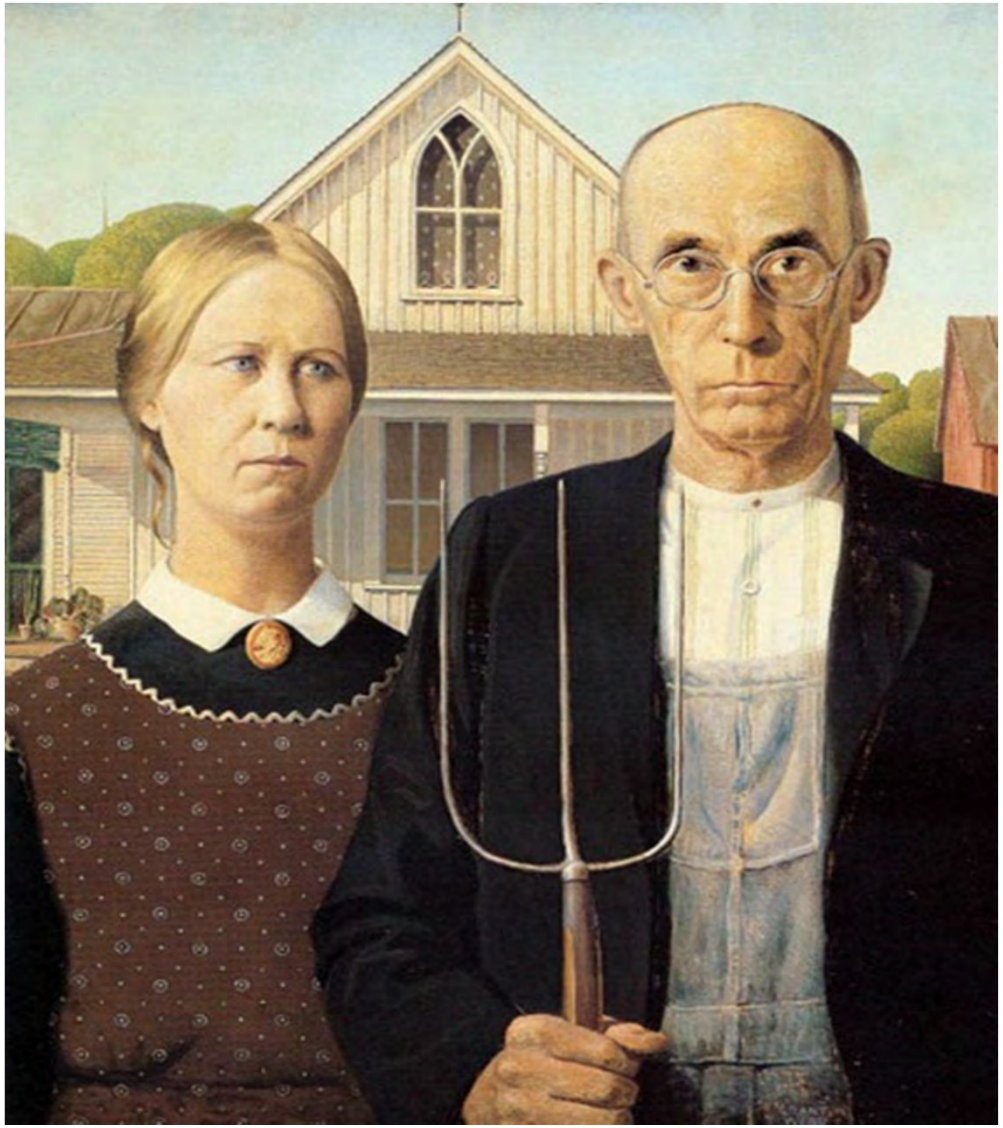
TECHNOLOGY EVOLVES

First Laser

(Light Amplification by Stimulated Emission of Radiation)

TECHNOLOGY EVOLVES



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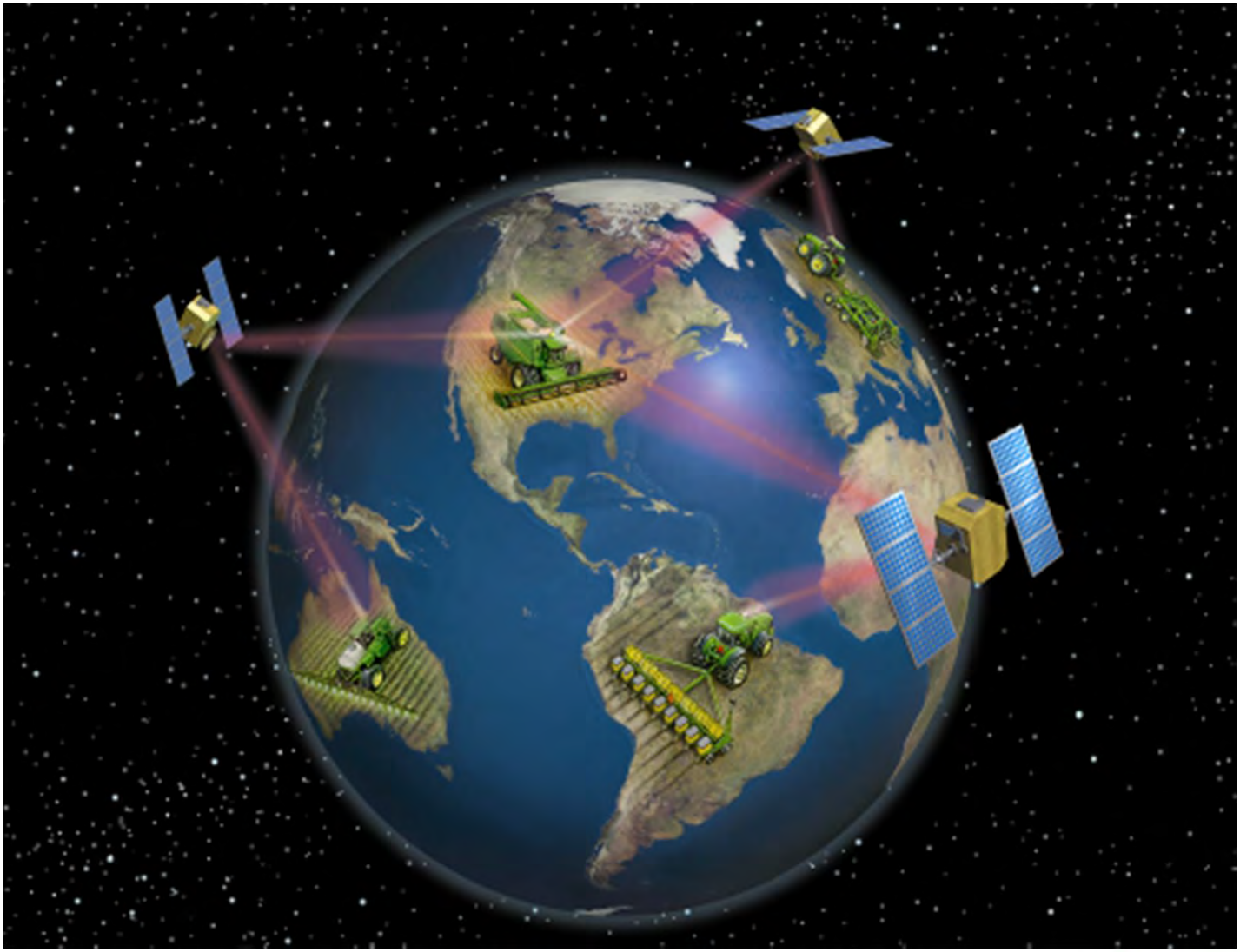
TECHNOLOGY EVOLVES



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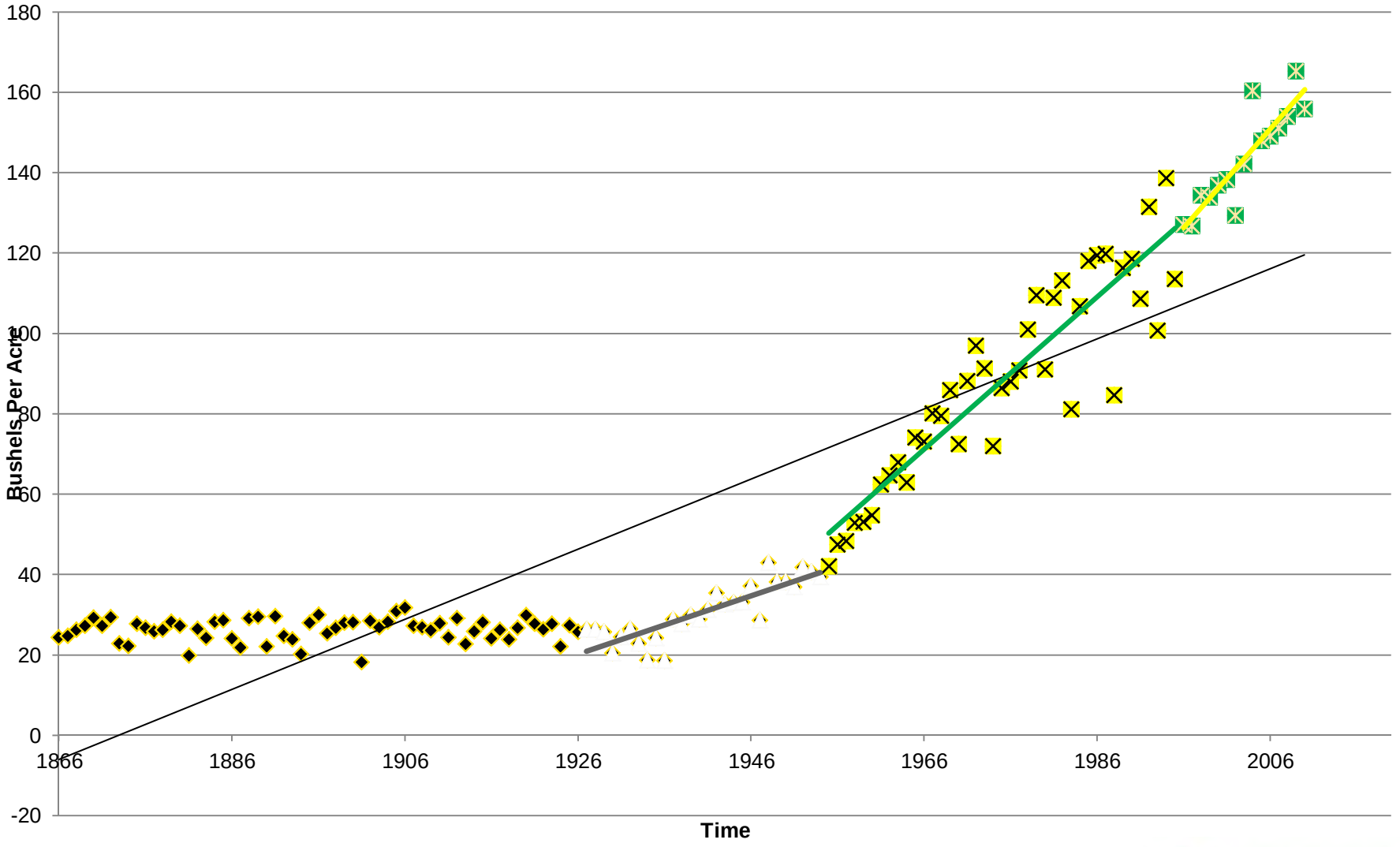
Can we grow enough corn?



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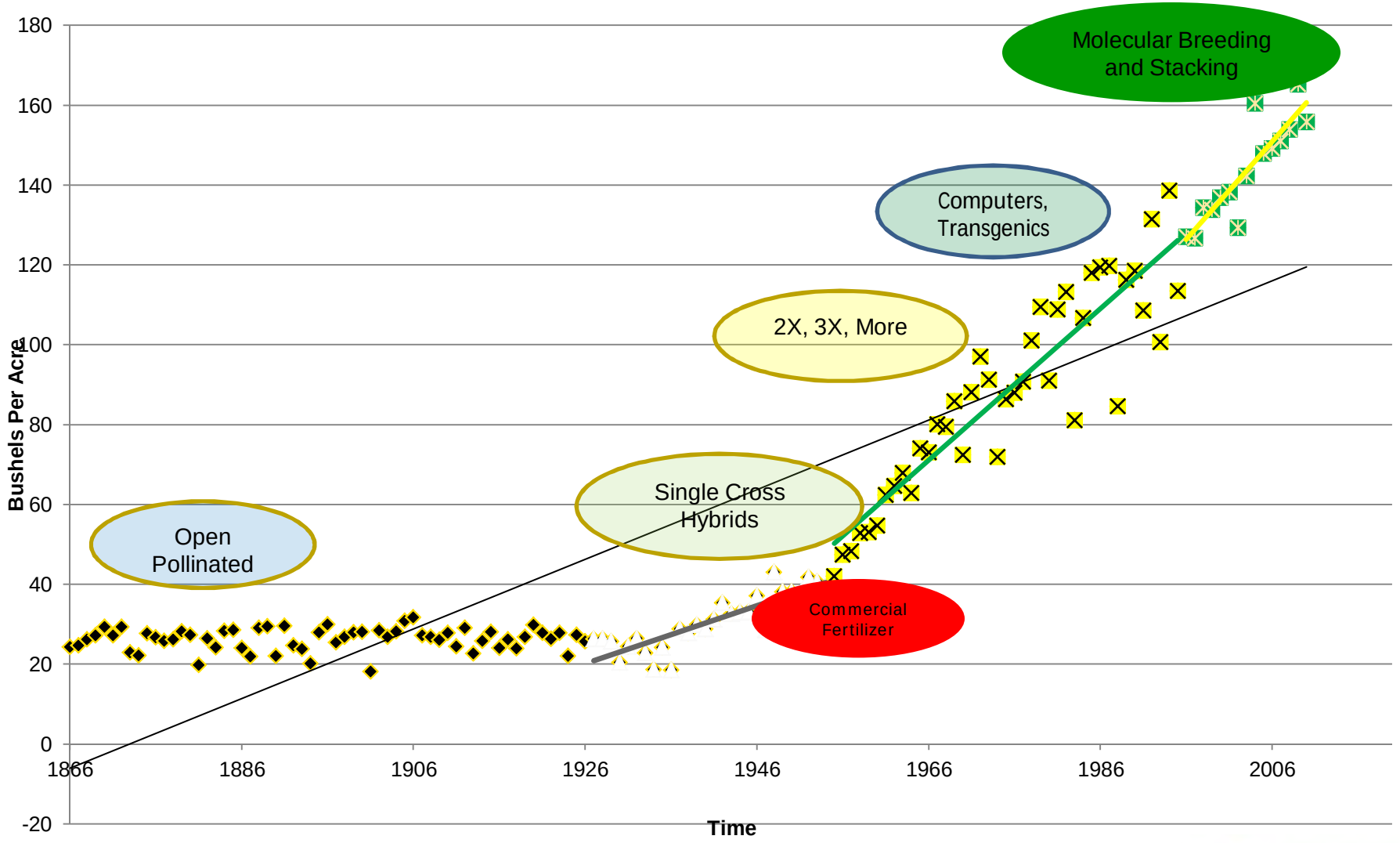
Historical Corn Yields 1866-2011



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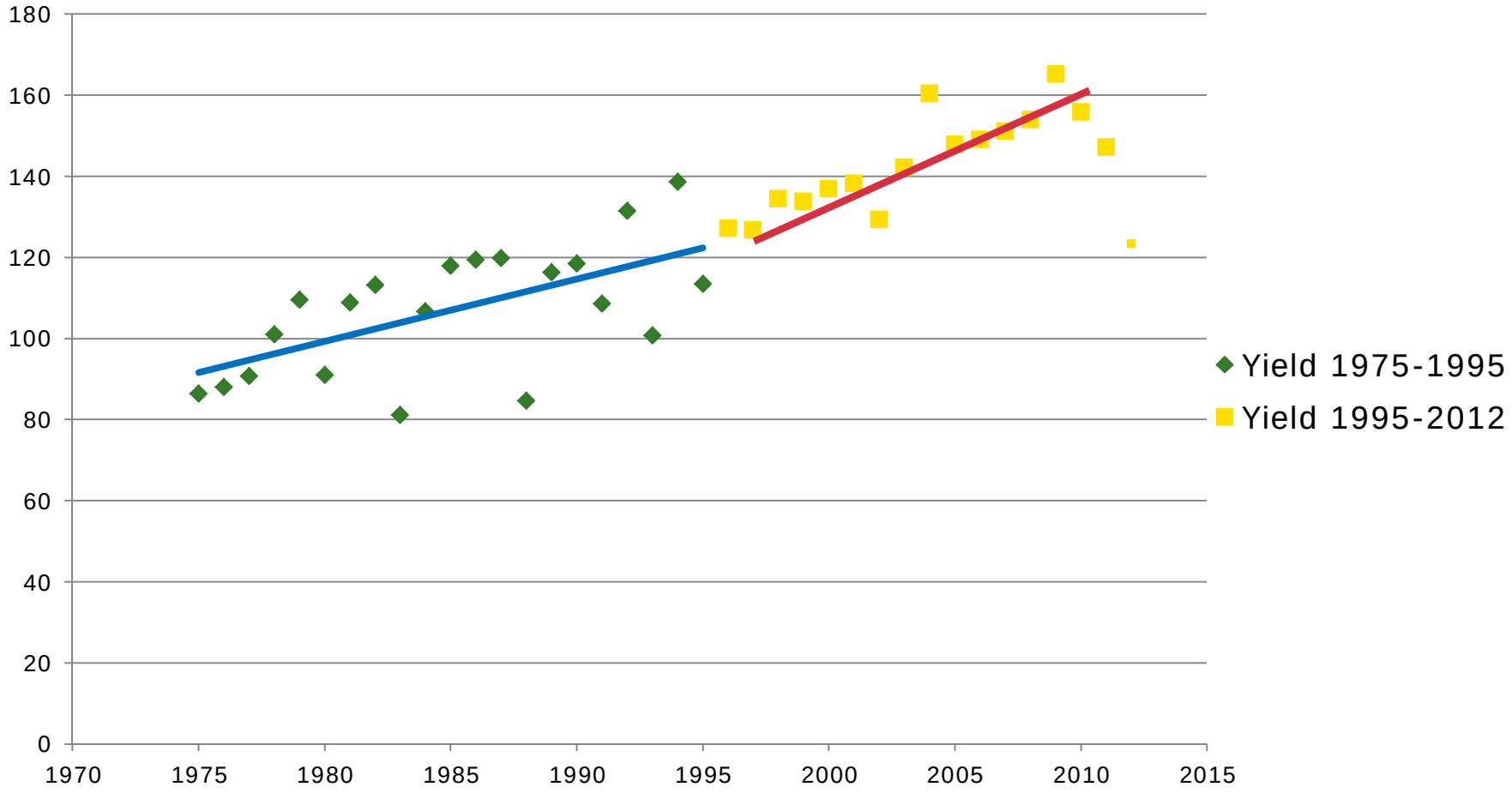
Corn Yield Data 1975-2012



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1982-2009

Farmland the size of Indiana lost to development– 23 Million Acres

Productivity Per Acre

20 Years of Progress

	Yield (Bushels Per Acre)	Acres To Produce 13 Billion Bushels
1989	116.3	113,499,570
2009	165.2	79,603,148

"Virtual" Acres Created	33,896,422

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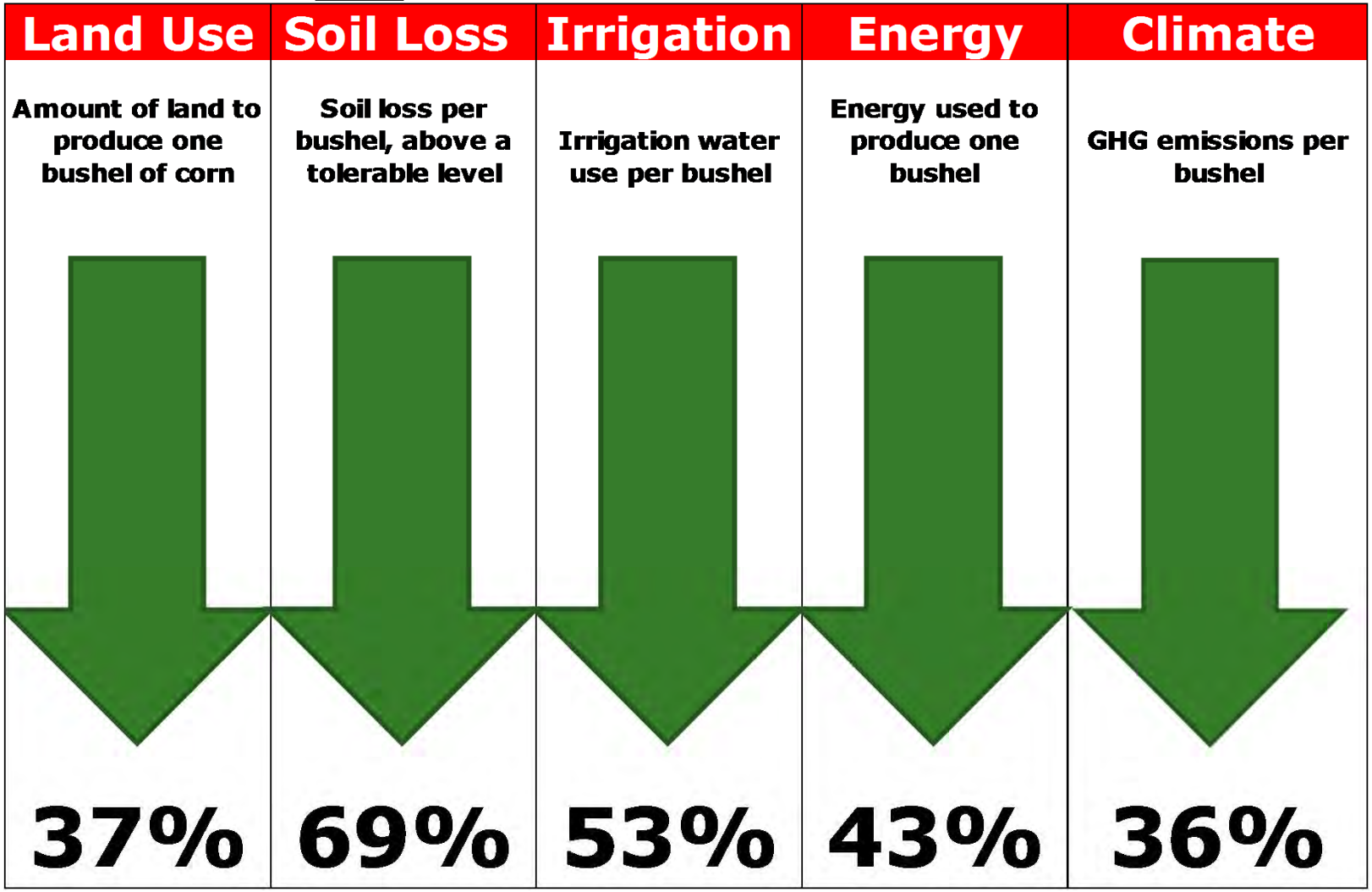
20 Years Of Progress



(USDA, U. of Nb., Field To Market)

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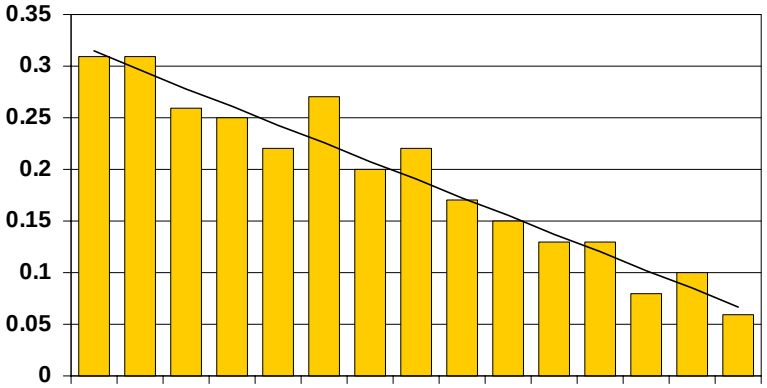
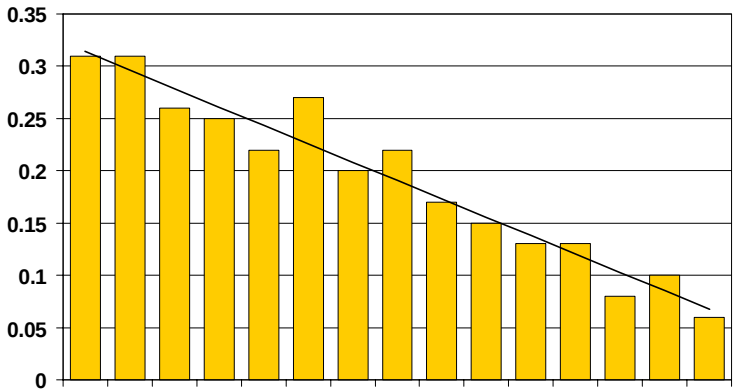
20 Years of Progress

Increasing adoption of hybrids with insect-resistant and herbicide-tolerant traits and precision application have greatly reduced the need for synthetic applications of herbicides and insecticides.

Insecticide Pounds Per Acre



Herbicide Pounds Per Acre



Source: USDA

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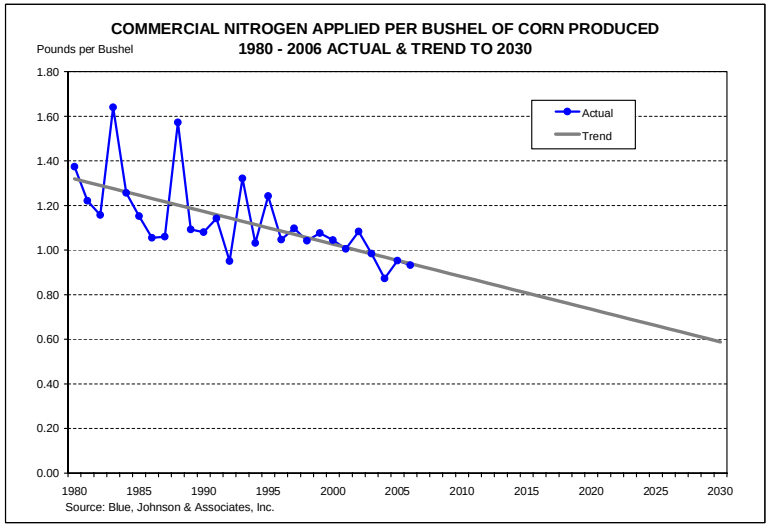
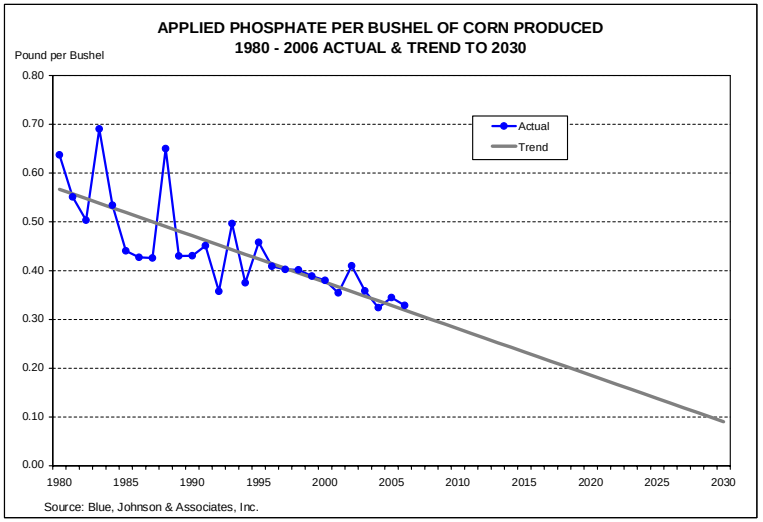
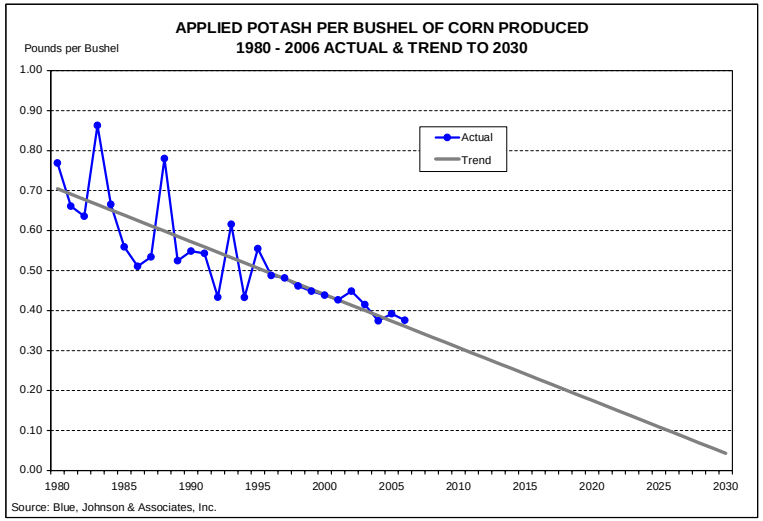
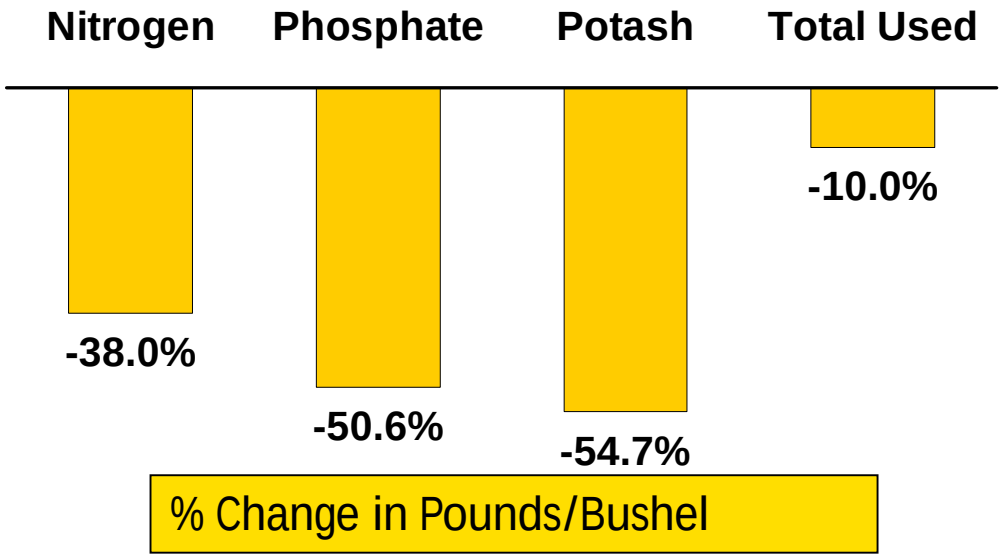
20 Years of Progress









Source: Blue, Johnson & Assoc. Inc. & The Fertilizer Institute

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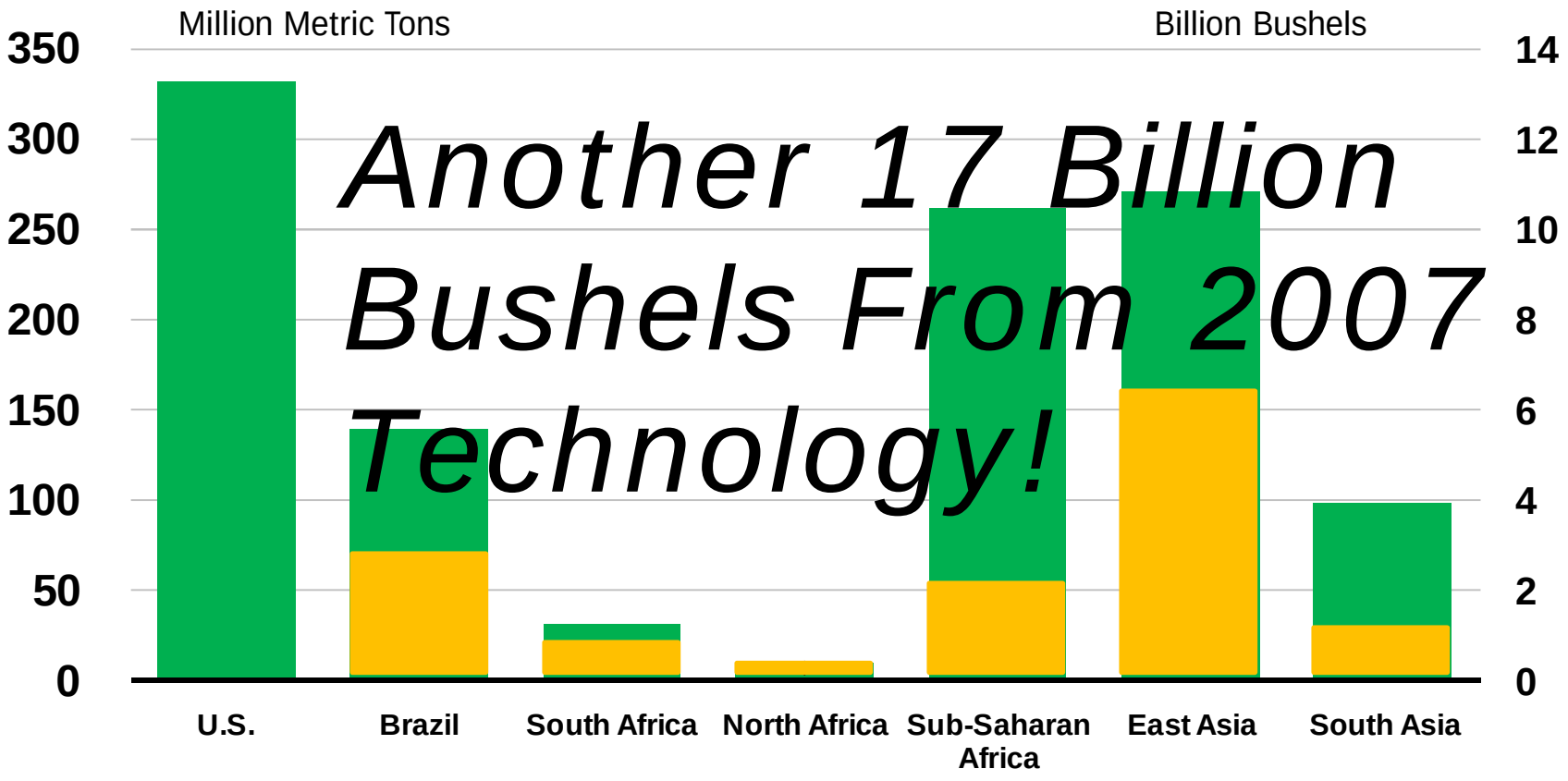
Developing World Productivity Opportunities

Corn production 2007, Actual and Potential with US yields.



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Can we grow enough Corn?

Yes, from a technology standpoint

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Perhaps not, if consumers don’t like the way we grow it

Can we grow enough corn?

Yes, from a technology standpoint

Perhaps not, if consumers don't like the way we grow it

Agriculture must proactively manage nutrients to gain customer acceptance

Sustainability Challenges

Environmental Groups Ask EPA to Limit Pollution Into 'Dead Zone'

Conservation organizations from nine states along the Mississippi River this week petitioned EPA for rulemaking under the Clean Water Act to set and enforce numeric limits on nitrogen and phosphorus flowing into the northern Gulf of Mexico that contribute to the gulf's "dead zone."

Proactive Technologies

Solutions that are Smarter, Faster *and more precise*

Proactive Technologies

Biggerwider
Vs.
Smarterbetter

THE BIGGERWIDER SOLUTION

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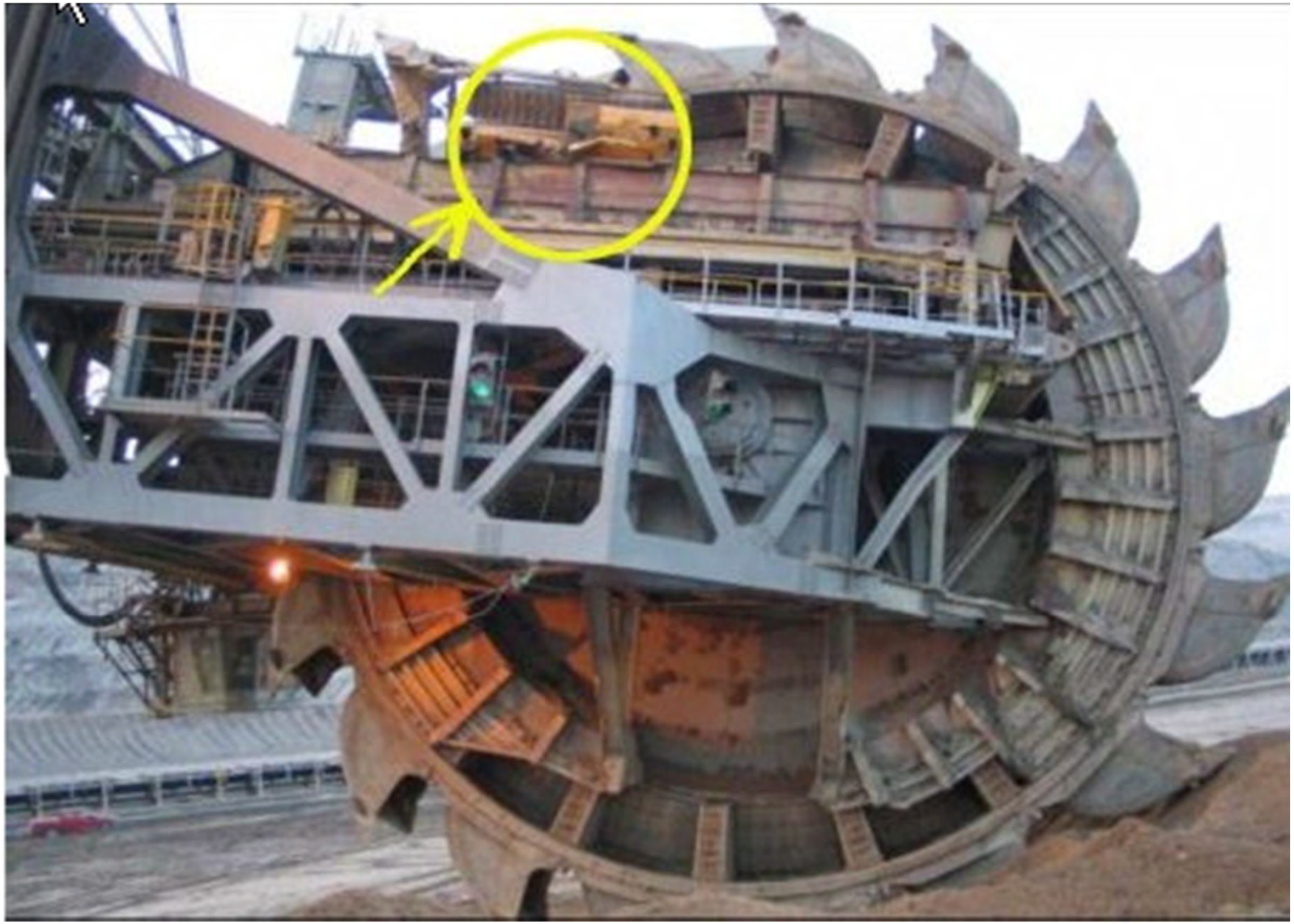
THE BIGGERWIDER SOLUTION



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THE BIGGERWIDER SOLUTION

The Fork in the Road?

Biggerwider?

- More horsepower
- More fuel consumption
- More carbon emissions
- More weight and compaction
- More capital (probably)

Proactive Technologies

The Smarterbetter Solution?

Proactive Technologies

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Proactive Technologies

- More soil friendly (less compaction)
- Low draft loads (less horsepower, less carbon)
- High residue capabilities
- High speed operation
- High speed “pit stops”
  - Smaller? Axle loads, tire capacities are issues
- NH3 or UAN (urea *may* involve too much soil disturbance or crop injury or volatilization)
- Enable *precise* nutrient and crop care application
- Subsurface application in sensitive watersheds

Emphasis on productivity through efficiency

Proactive Technologies

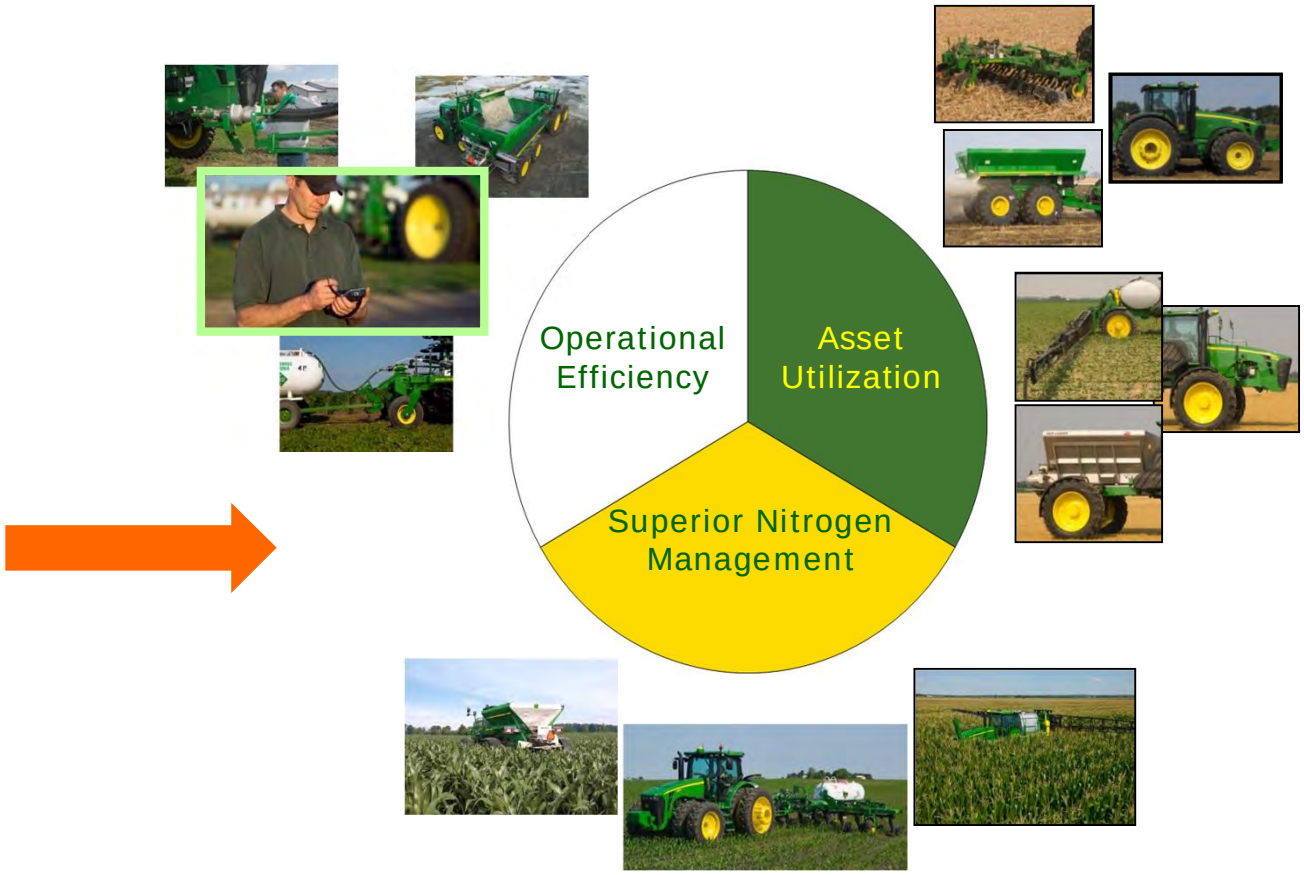
Technologies and Enablers

- Silicon processors replace carbon processors
  - RTK Guidance to eliminate overlap, enable speed, precise nutrient location
  - Geospatial control at each opener/nozzle
  - Variable rate application tied to soil history, location, permeability, etc.
    - collect, share, manipulate, analyze and act on machine data
- Enable multiple application—Make multiple applications practical and routine
- Real time sensing of nutrient needs
- Minimize carbon footprint
- "Mistakeproofing" (Silicon processors can be better than carbon processors in eliminating misapplication)

Emphasis on productivity through efficiency

Proactive Technologies

From “Product” focused to “Solution” focused...



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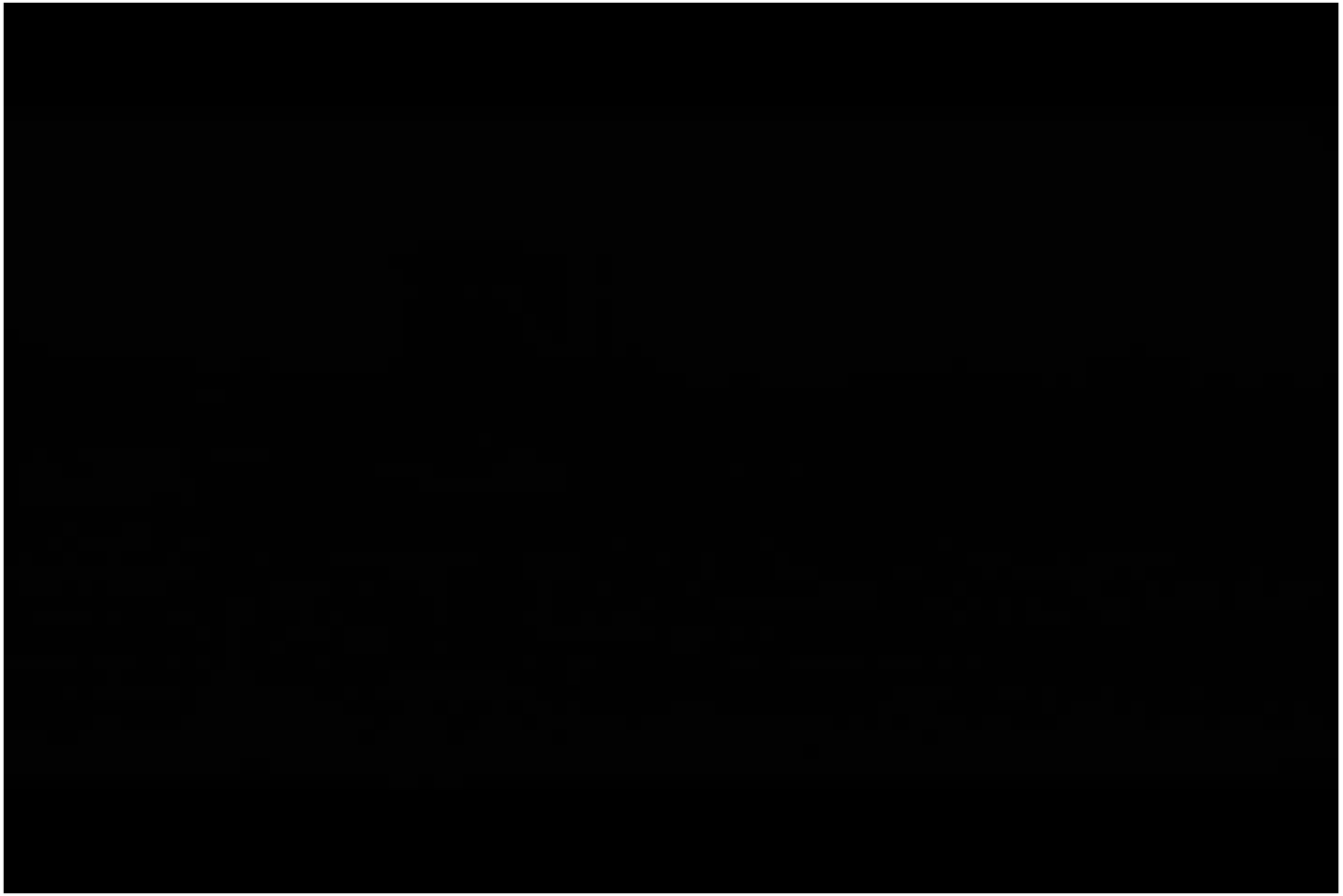
High Speed Liquid Pit Stops



High Speed Nitrogen Applicator

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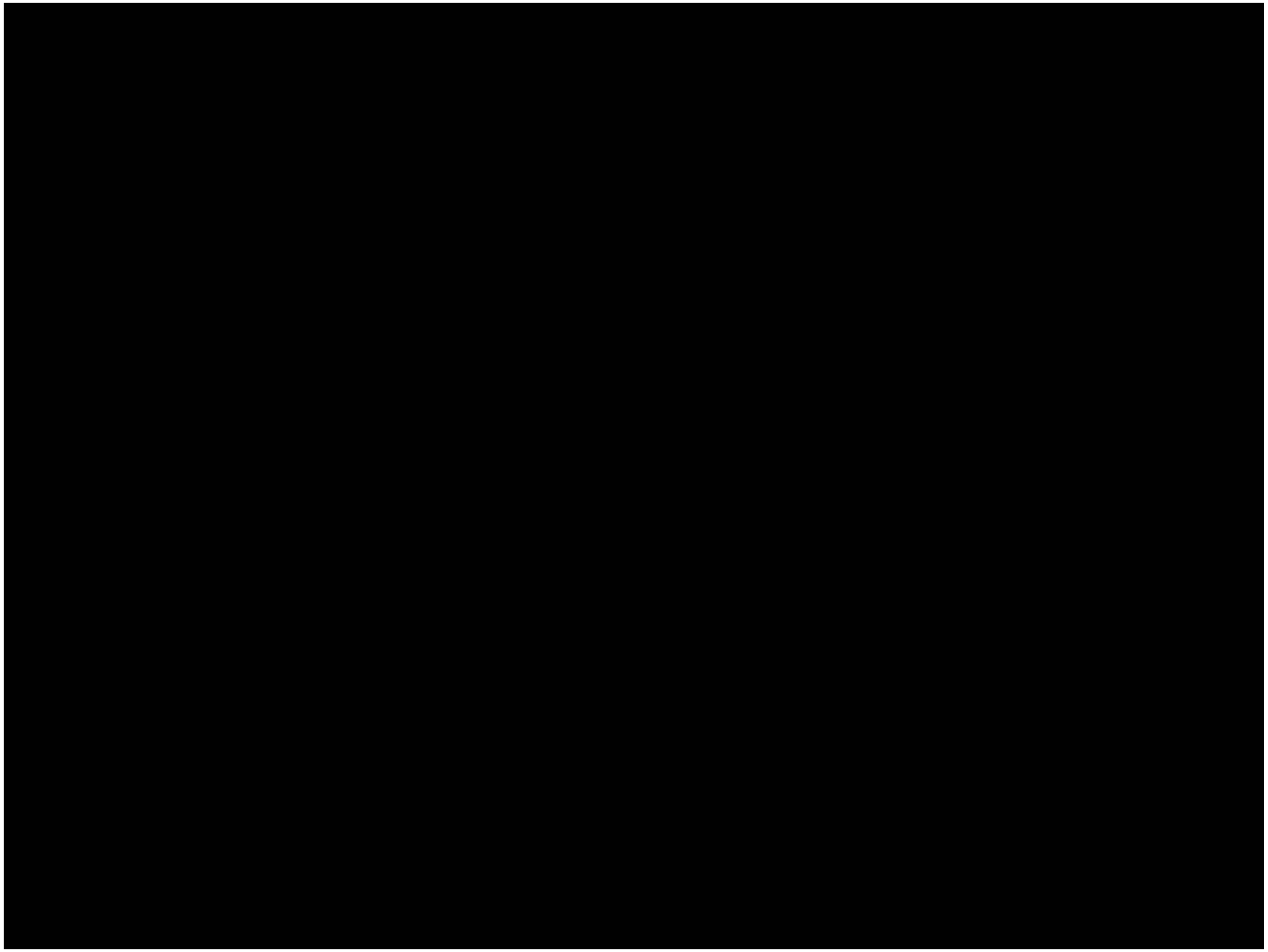
High Speed NH3 “Pit Stops”



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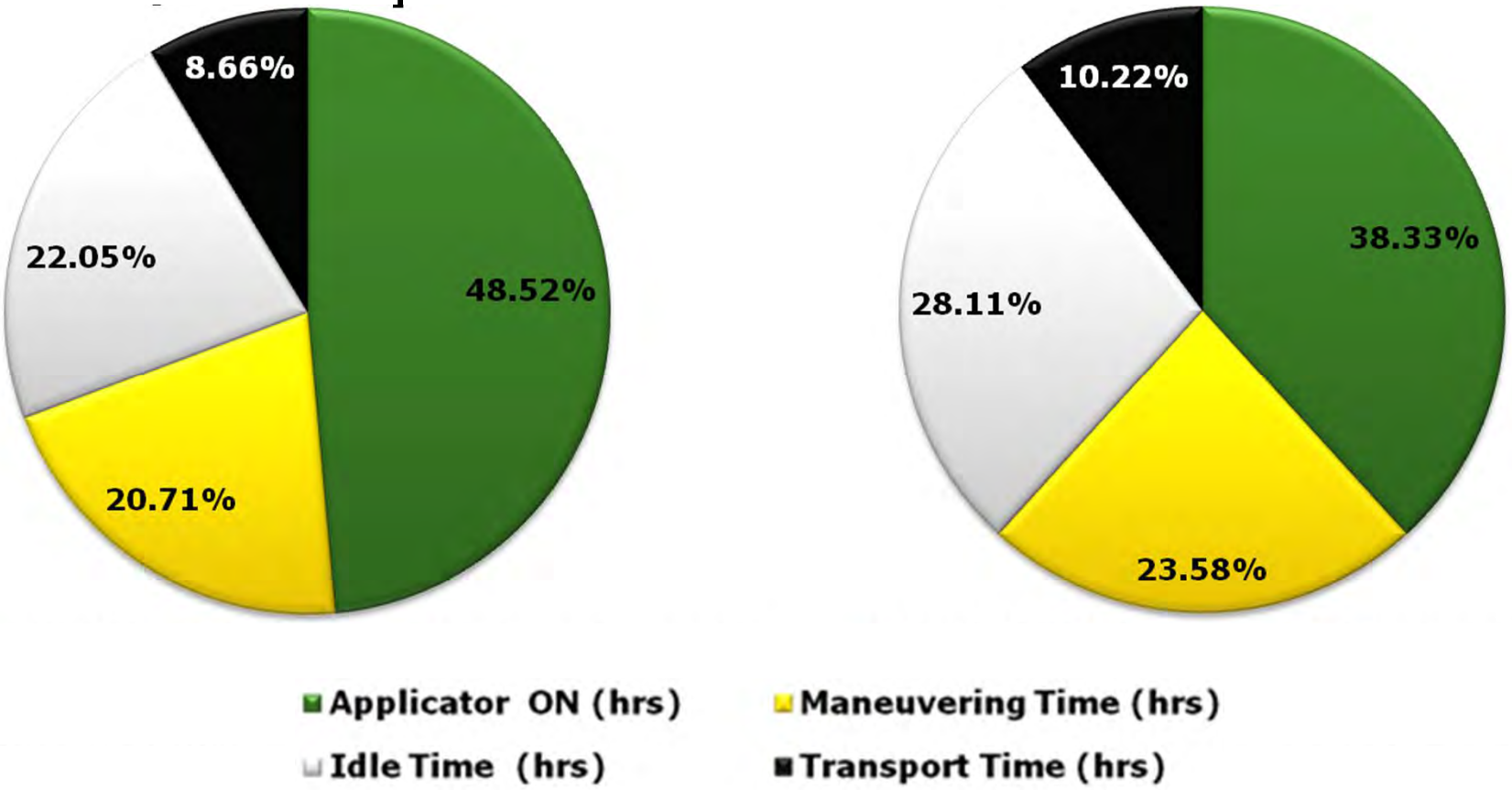
Some Results...

23R 2510H w/PitStop Pro

vs.

25R Conventional Bar



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Side by Side Results...

	23R 2510H w/ PSP	25R Conventional Bar
Acres Applied	5250 acres	2078 acres
In field Productivity	56.25 acres/hour	39.63 acres/hour
Actual Productivity	27.29 acres/hour	15.19 acres/hour
Fuel used/hour	20.56 gal/hour	28.58 gal/hour
Fuel used/acre	0.54 gal/acre	0.91 gal/acre

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