

Cellulosic Considerations



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STARTUPS 101:

(Things to think about)

What's the demand for what I do?

Can I compete?

What happens if I succeed?

Deere and Cellulosic Ethanol:

- **We like it.**
- **We think it has promise.**
- **When it's viable, the environment benefits, our country benefits, our customers benefit and we benefit.**

**The marketplace will
forgive some optimism.
But it is unrelenting in it's
punishment of business
plans based on anything
other than pragmatism.**

What's the demand for what I do?

- +/-200 billion gallons
- Lots of room if you're competitive or the market is willing to pay more
- If you're not competitive, be prepared when (not if) the market decides it won't pay more

Can I compete (right now)?

- Who?
 - Starch and Sugar Cane

Can I compete (long term)?

- Who?
 - Starch and Sugar Cane
 - Oil

Can I compete (long term)?

- Who?
 - Starch and Sugar Cane
 - Oil
 - Electricity

Can I compete (indefinitely)?

- Who?
 - Starch and Sugar Cane
 - Oil
 - Electricity
 - Whatever else works (or can capture imagination and funding)

Can I compete (today)?

- Consider the entire production chain
- Conversion technologies and capital requirements are critical, but no more critical than what it costs to grow it, harvest it, haul it, and store it.

Can I compete (today)?

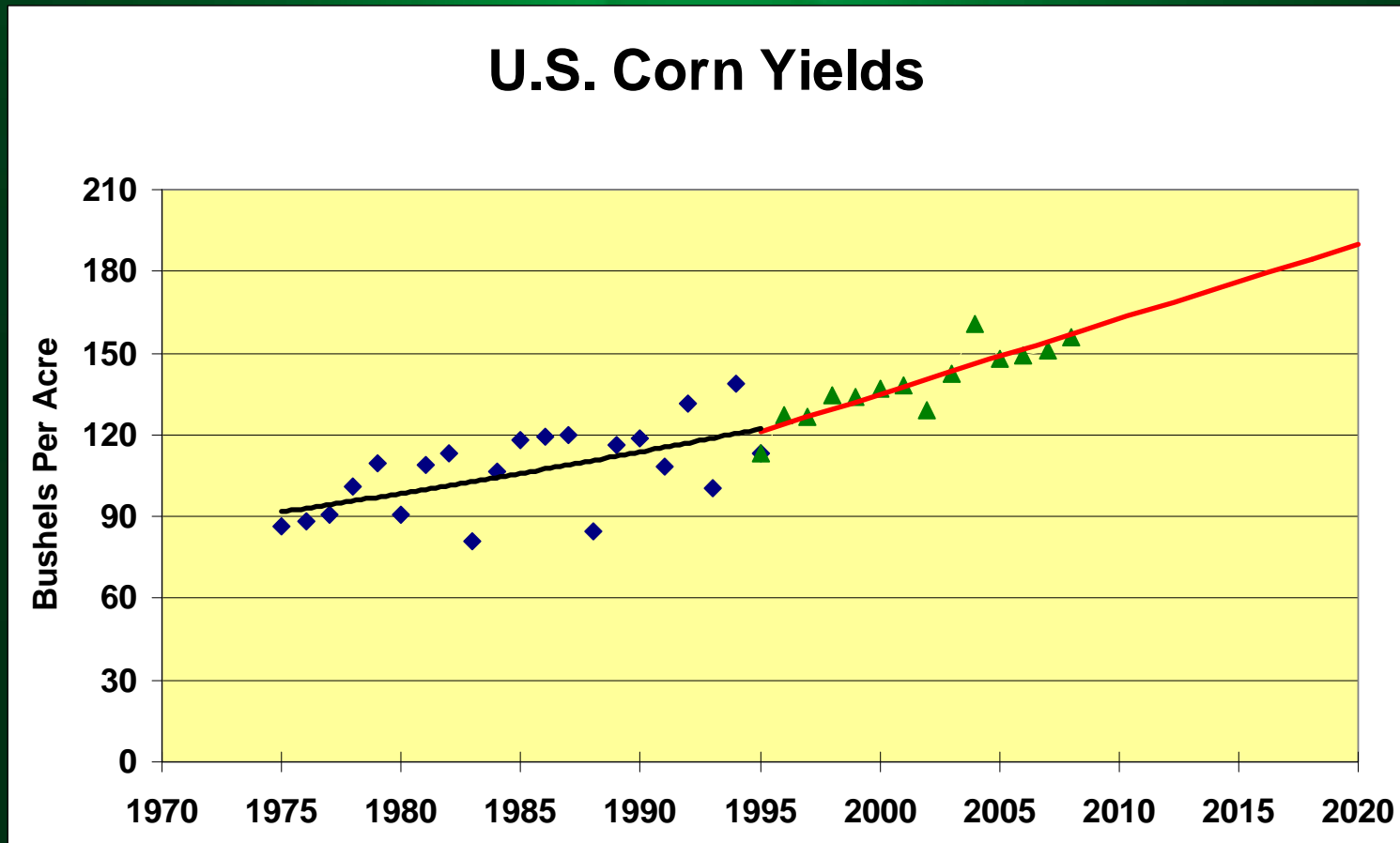
- It costs less to load 55,000 lbs of corn than to load 55,000 lbs of bales
- It costs about the same to haul a load of corn as a load of bales
- It costs less to unload and store a load of corn than a load of bales for 11 months
- Corn yields about 110 gallons per ton
- Does cellulose yield more or less?
- How do you make up for, or take advantage of, the difference?

Can I compete (today)?

- CBOT 7/14 2009 December Corn =
\$3.43 per bushel
 - \$1.11 per gallon
 - \$122.50 per ton
- @ 60 gallons per ton, cellulose must cost =<\$68.39 per ton, delivered, to have the same feedstock cost as with \$3.43 corn

Can I compete (today)?

- Molecular breeding and trait stacking show remarkable corn yield changes going forward (1975-'95 +1.29 BPA/yr. 1995-'08 +2.89 BPA/yr)



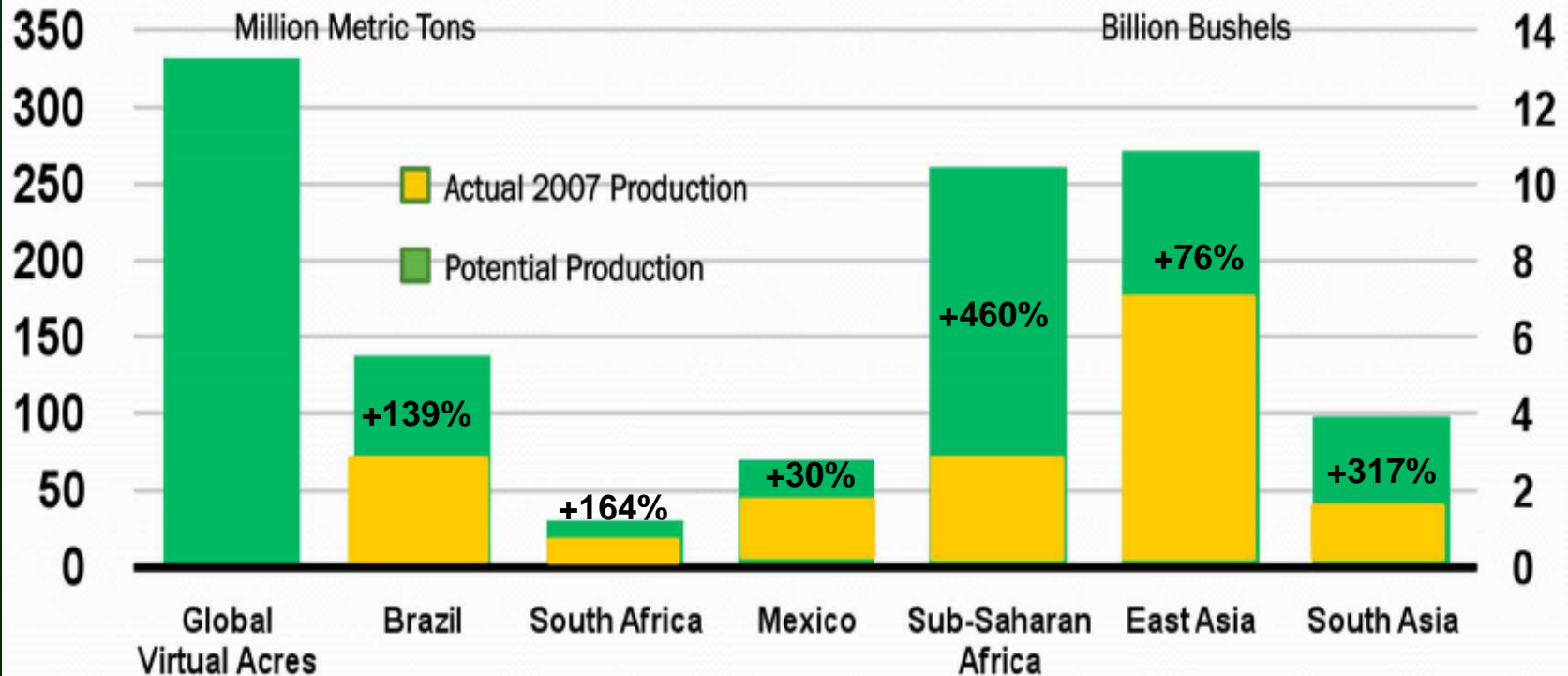
Can I compete (today)?

- '95-'08 trend line (before multiple stacks) delivers 174 BPA (14.4BBu.) in 2015
- 14.4 B bushel corn crop allows:
 - 16.7 billion gallons of ethanol
 - **And** corn exports equal to 2006 (2.224 B Bu)
 - **And** HFCS production equal to 2006 (520 M Bu)
 - **And** The same amount of whole corn feed as 2006 (5.975 B Bu)
 - **And** The same misc. use (1.385 B Bu)
 - **And** with fractionation technology at all plants you also get 1.25 Billion gallons of biodiesel (Corn oil alone could enable B2)

Can I compete (long term)?

Developing World Productivity Opportunities

Corn production 2007, Actual and Potential with US yields.



Exporting U.S. Yield Capabilities Could Add 17 Billion Bushels of Corn

What happens if I succeed?

- New detractors
- New competitors
- New regulations
- New political pressures
- New allies

What happens if I succeed?

1. I become a target
2. I need allies

What happens if I succeed?

1. I become a target. **So what? Would you rather be on the outside looking in?**

What happens if I succeed?

1. I become a target (So what? Would you rather be on the outside looking in?)
2. I need allies (**You sure do! Corn, Cane, Oil, Environmentalists, and Consumers come to mind**)

What's next?

**Go home and go to
work. We've got a lot
to do!**