Ethanol Production:
Current Status
Future Trends
Implications

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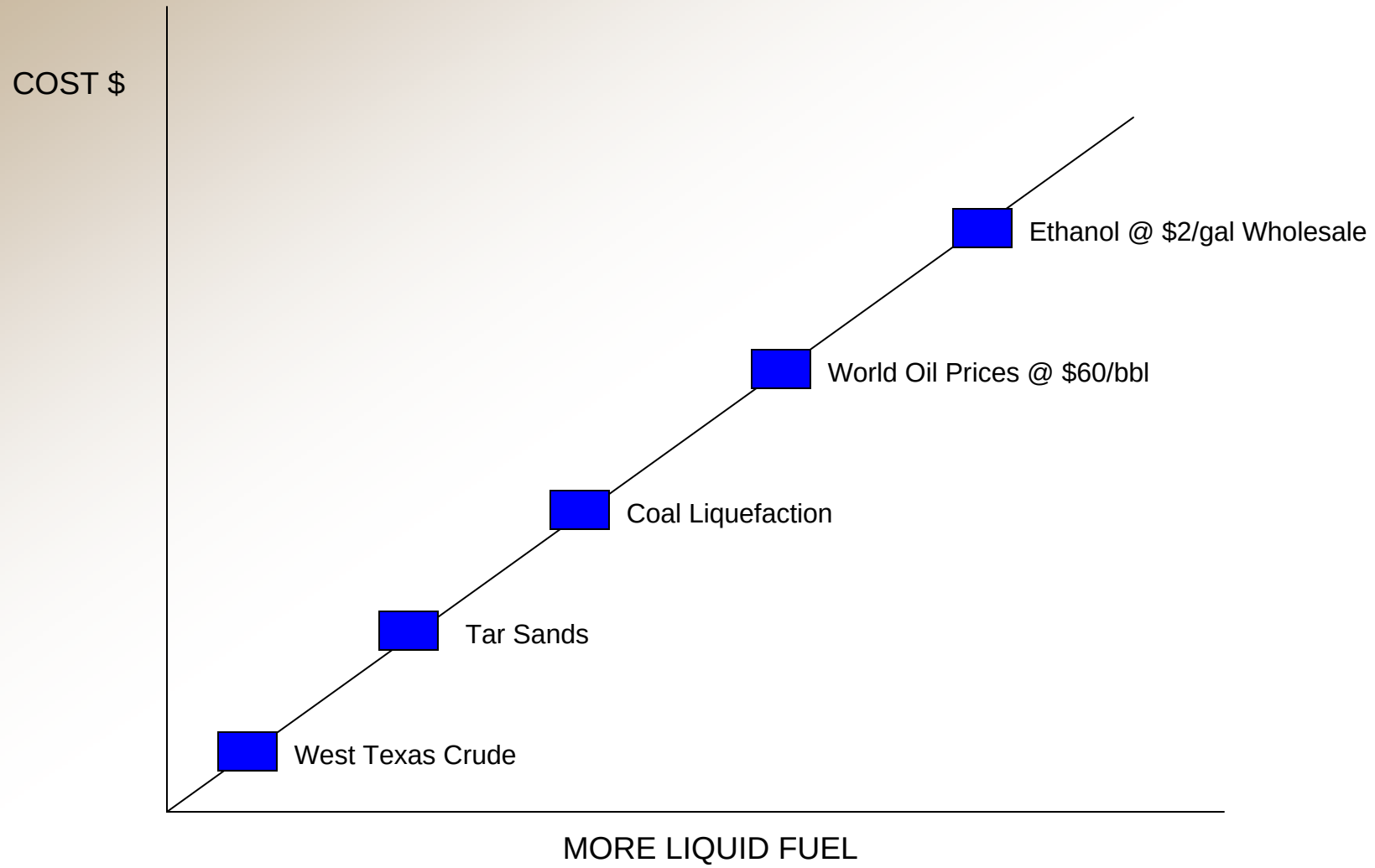
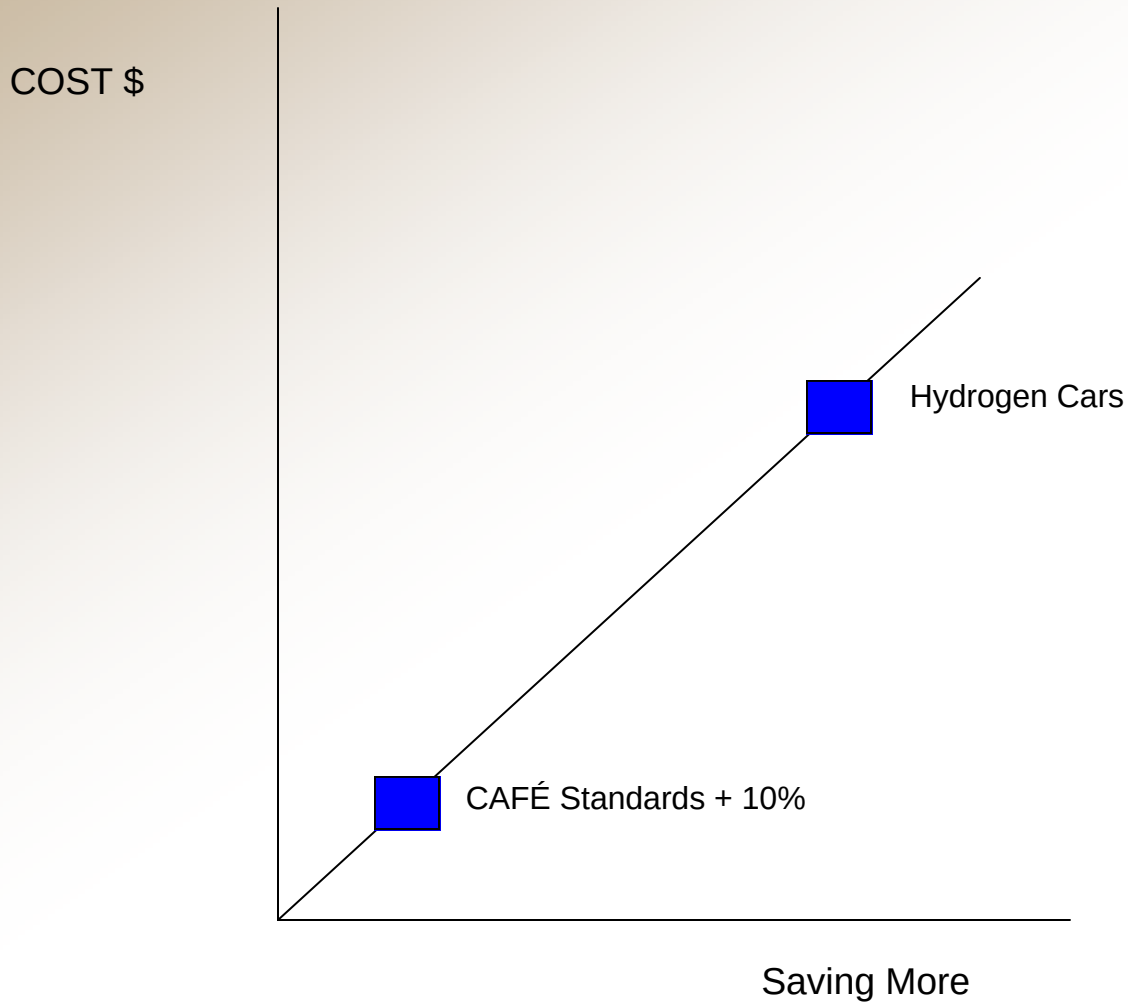
Background on Liquid Fuels

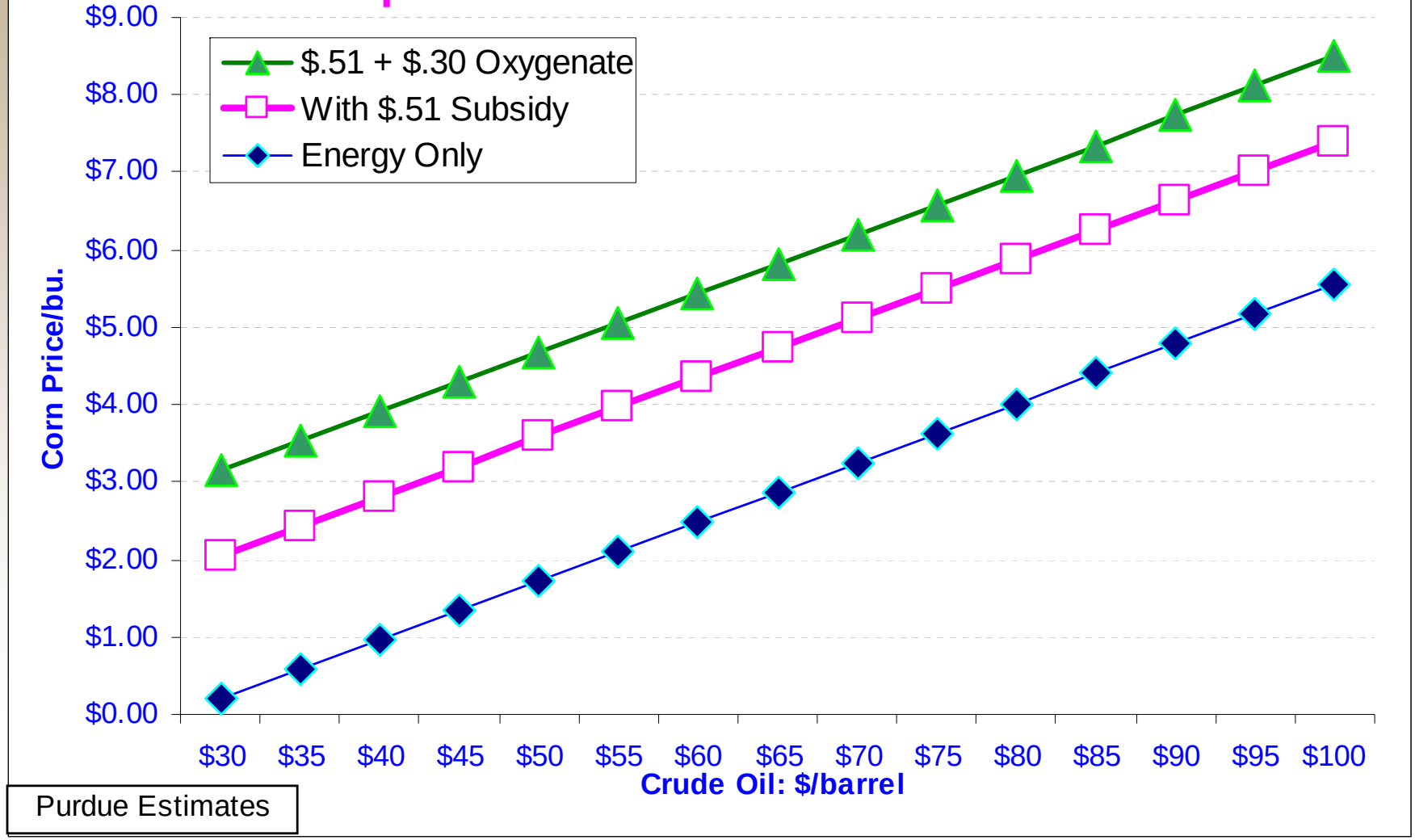
Marginal Cost of Liquid Fuel Supply



Marginal Cost of Liquid Fuel Saving (Replacement)



Corn Breakeven Price:
September 2006 Estimated Costs



Projecting to 2017

“Ethanol production from corn grain could grow to nearly 20 billion gallons by 2017.”

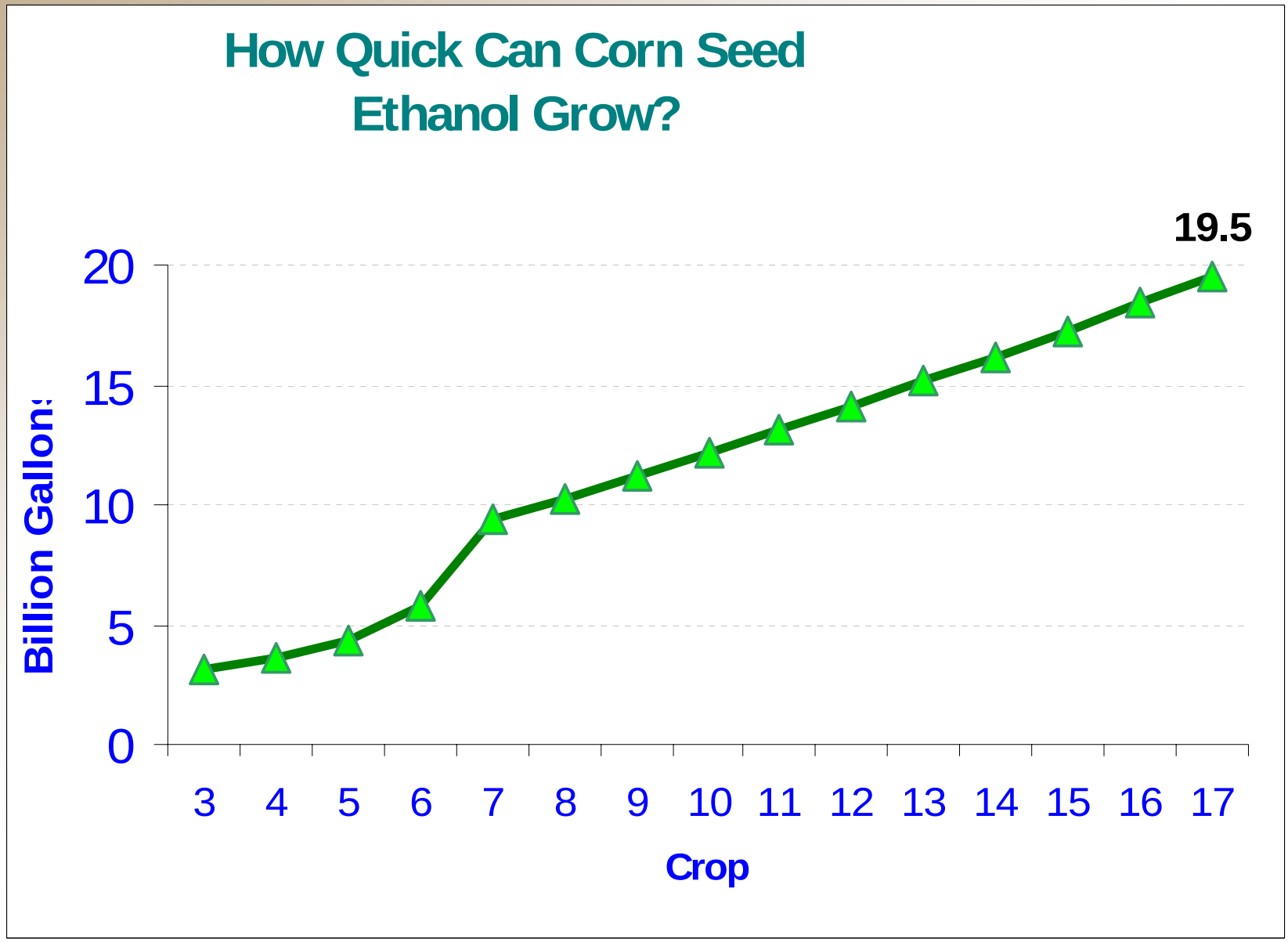
Judgments and Assumptions to obtain this future possibility:

1) Corn acreage is at 89 million acres in 2007 and then increases 1% a year to 2017.
2) Yields increase 1.7% per year (past increases were 1.5%).
3) Animal feed use drops for 2007-08 as livestock sector adjusts to high corn prices. Starting 2008, total corn consumption with addition of DDGS increases 1.5% a year.

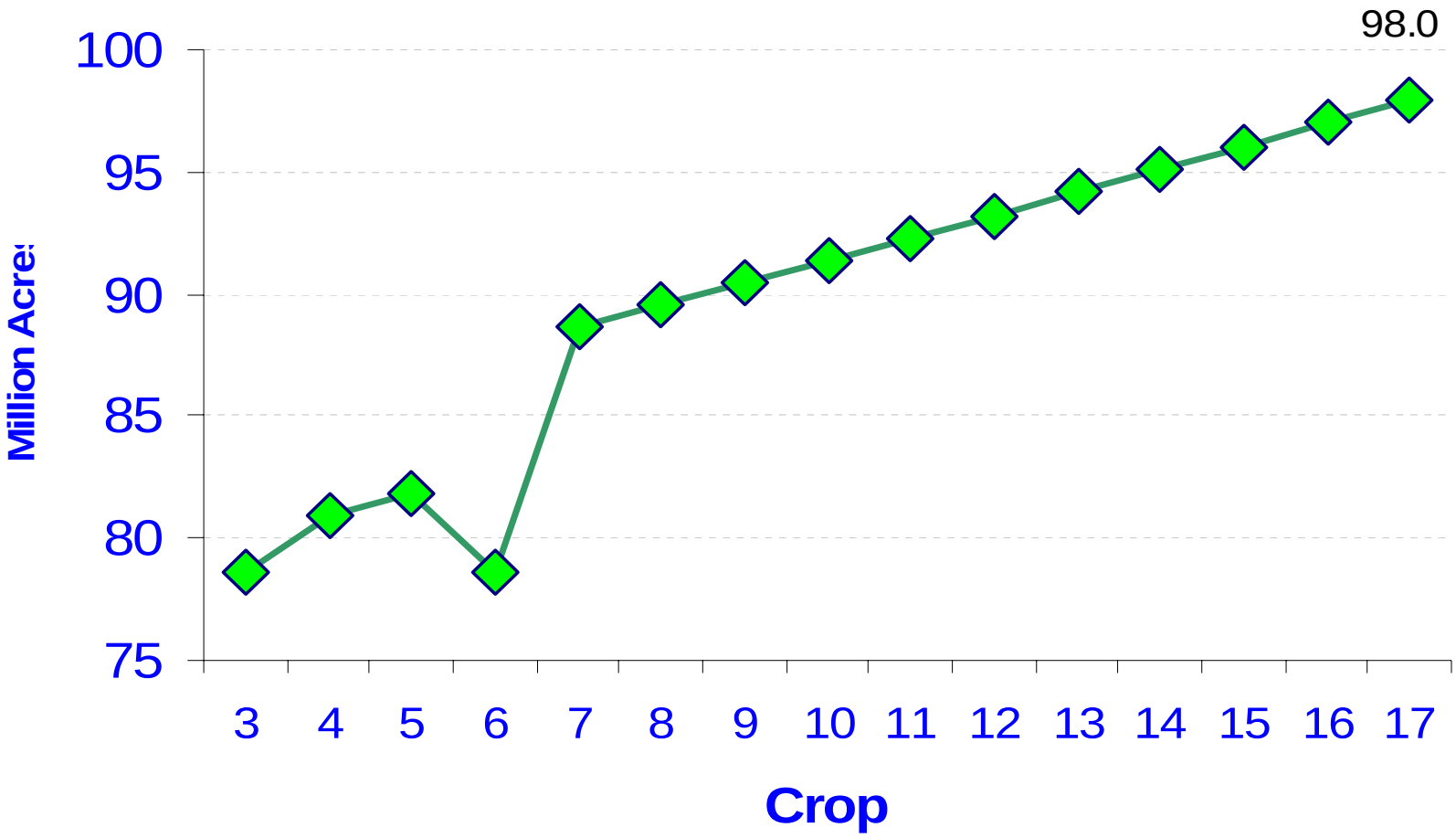
4) Livestock industry grows 1.5% a year meeting US population growth and allowing modest export increases.
5) Corn exports drop 2% per year.
6) Non-fuel seed, food, and industrial growth are at historical trend.

There is no specific price assumption- the various uses bid against each other and the non-fuel uses competing here are thought to be able to obtain corn at the volumes needed given the added acres projected.

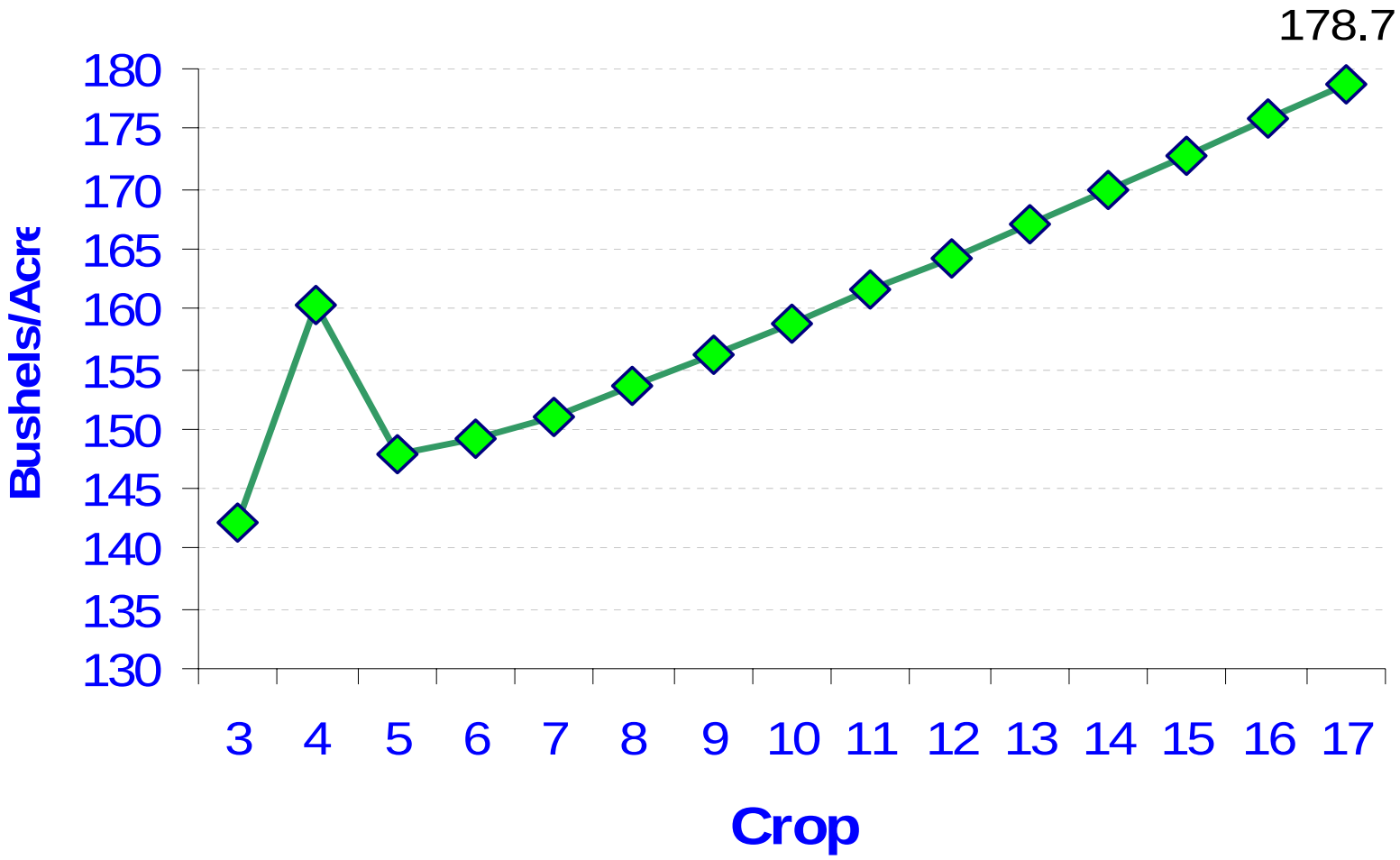
No CRP land is brought into production under this scenario.
If 10 million acres of CRP land suitable for corn/soybeans were brought in, this lower productivity land might yield 4 billion gallons of additional ethanol.

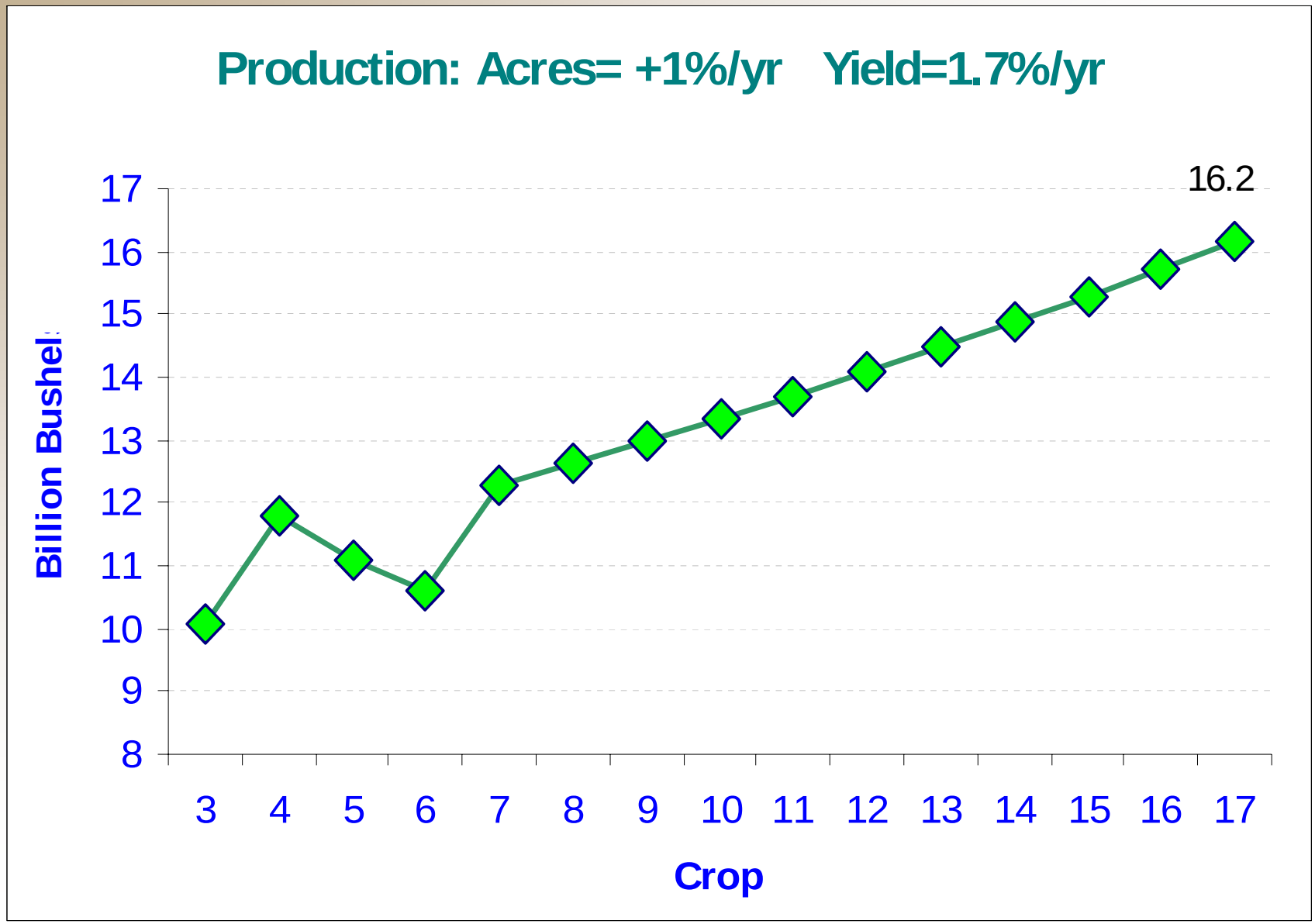

How Quick Can Corn Seed Ethanol Grow?
19.5
20
15
10
5
0
Billion Gallons
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
Crop

Acres of Corn: +10 Million in 07 Then 1% Per Year

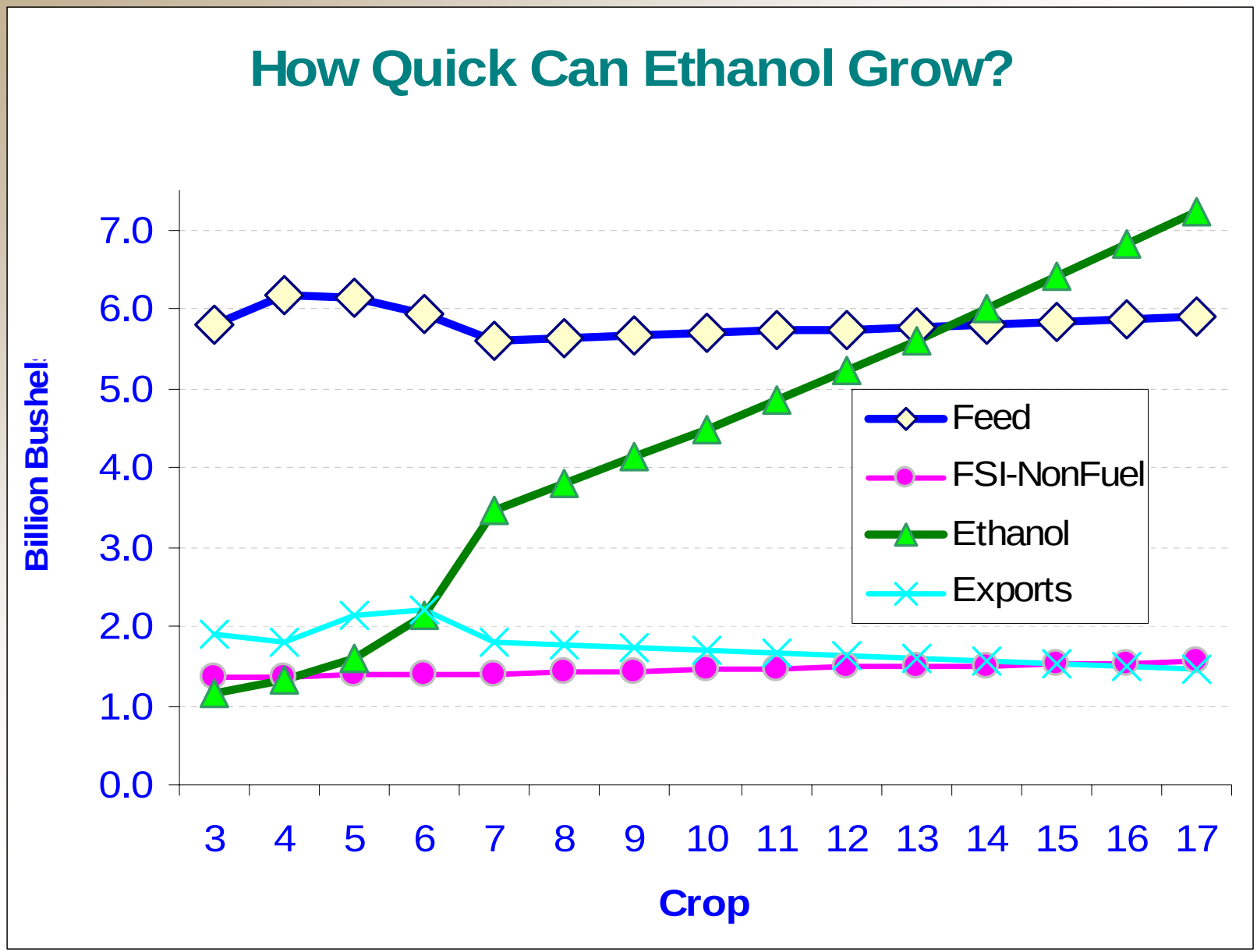


Corn Yields Per Acre: 152 in 2007 then 1.7% Per Year Increase




Production: Acres= +1%/yr Yield=1.7%/yr
16.2
17
16
15
14
13
12
11
10
9
8
Billion Bushel
3 4 5 6 7 8 9 10 11 12 13 14 15 16 17
Crop

How Quick Can Ethanol Grow?



The Other Growth Issues:

Logistics
Land Use
Limits

Does Cellulosic Solve These?

What About Water Quality?

What About Strategic Liquid Fuel Concerns?

Estimated Changes in U.S. Oil Supply and Demand in 2030 for the Modified NCEP Oil Independence Strategy (Millions of Barrels per Day)

	Oil Demand	Oil Supply
Reference Case	**27.57**	**10.42**
NCEP Changes		
Light vehicle fuel economy	**-3.50**	
Heavy vehicle fuel economy	**-0.53**	
Rail and ship energy efficiency	**-0.20**	
Eliminate building heating with oil	**-0.37**	
Industrial efficiency, substitution	**-0.62**	
Coal to liquids		**1.00**
ANWR and Pacific Offshore		**2.00**
Biofuel	**-2.00**	
Subtotal: Decrease in Demand	**-7.22**	
Subtotal: Increase in Supply		**3.00**
NCEP Case Totals	20.35	13.42
Percent Change from Reference Case	**-26%**	**29%**

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Oak Ridge National Laboratory
for their article on "Oil Independence"

For more information see http://www.ces.purdue.edu/bioenergy