NCGA Corn-to-ethanol Capacity estimates
for 10% fuel ethanol inclusion nationwide by 2015

Current Production:

USDA – ERS and PRX data show similar numbers for the 05/06 crop year:

	Harvested Acres (million acres)	Yield/ Acre (bu)	Total Production (million bu)
(05/06)	74.3	148.4	11032

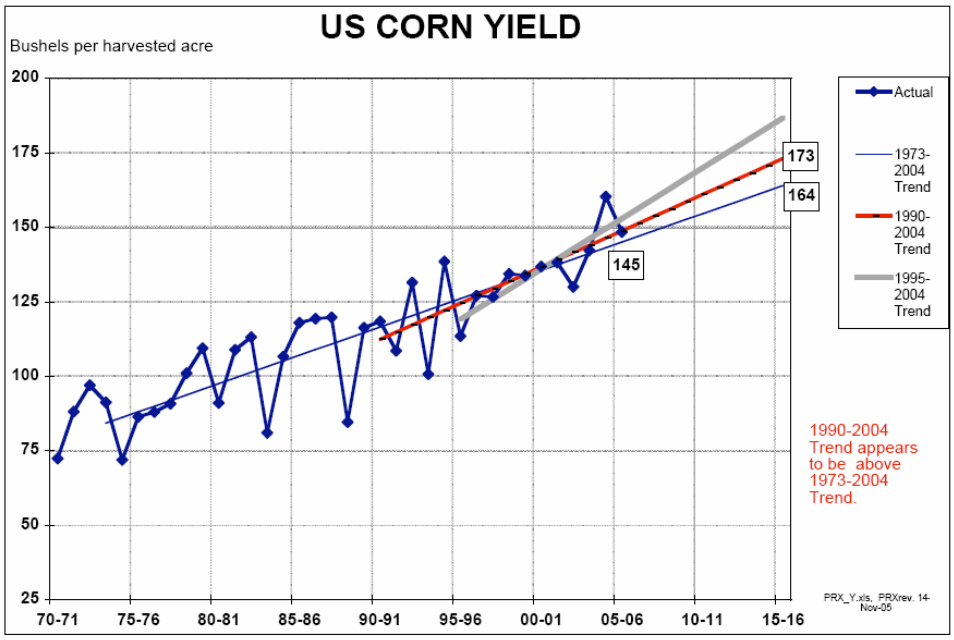
Corn-to-ethanol usage is approximately 1.6 billion bushels in crop year 05/06, producing 4.5 billion gallons of fuel ethanol.
Thus industry efficiency is calculated at 2.73 gallons of ethanol/bu of corn.

4501 million gal ethanol / 1648 million bu corn = 2.73 gallons/bu

The remainder of corn production (feed, seed, residual, non-ethanol industrial, export carryover, etc.) will not be separated for the purposes of this estimate.

Historic production and assumptions for 10-year predictions:

Corn production, PRX/USDA crops years 74/75 to 05/06, has increased from 4.7 billon bushels to 11 billion bushels. More specifically, from 95/96 we have seen an increase from 7.4 billion bushels to 11 billion bushels.



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(Source: 2005 ProExporter Network)

1) Consideration of production and yield increases over the last 10, 15, and 25 years were determined to be reasonable goals reached in the next 10 years.
2) Consideration of USDA baseline predictions, PRX forecasting and DOE estimates for acreage and yield were considered.
3) Natural gas for fertilizer production and other fuel prices are assumed to return to trend rates/increases, mitigating a long-term increase in corn production costs.

USDA Baseline, PRX & DOE estimates for 14/15:

	Harvested Acres (mill)	Yield/ Acre	Total Production (1000s)
ERS (based on 20-year history)	76.6	161.8	12393.88
DOE	76.6	207.3	15879.18
PRX (based on30-year history)	~79	164	12956*
PRX (based on15-year history)	~76	173	13148*
PRX (based on 10-year history)	N/A	~187	N/A

*NCGA calculated estimate

Notes: *USDA feed grains baseline, 05-14*
The number of acres planted to corn is expected to total 81 million in 2005 and increase to 84 million by the end of the baseline.
ERS yield trend tracks back 10 years before biotech inclusion, still predicts yield over 161 bu/acre by 2014.

Notes: *DOE, Billion Ton Feedstock Study*
(Study designed not to increase corn acres due to emphasis on increasing acres of biomass crops)
DOE predicts moderate to high corn yields taking into consideration technology changes to range from 172.75 (low case) to 207.3 (high case) by 2014.

Note: *PRX*
Yield per acre increases take into consideration the effects of production efficiencies realized in the last 15 years, then the benefits of biotech hybrids in the last 10 years.

NCGA forecast

1) Yield: benefits of research, biotechnology and other models, average yield of 178 to 187 bushels per acre can be easily realized in 10 years
2) Acreage: Biotechnology and crop management programs can increase total acreage by making corn on corn more feasible resulting in a potential 76 to 78 million acres of corn harvested by 2015. Also assumes minimal acreage will shift from soybeans and cotton, provided corn input costs return to trend.
3) Whole corn usage in all other markets will remain flat, as ethanol coproducts will increasingly displace corn in livestock feed rations, mitigating any increase in increased feed demand.
4) Conversion of corn to ethanol is estimated to increase, conservatively to 2.9 gallons/bu by 2015, recognizing the increase in dry grind processing facilities and that further efficiencies can be realized.
5) Carryover stabilizes (average).

Whole corn usage in non-ethanol markets stands at 9.1 billion bushels in 05/06. (USDA/PRX) These scenarios assume non-ethanol usage will remain at or near that level

NCGA Moderate and High case scenarios:

	Harvested Acres	Yield/ Acre	Total Production (mill bu)	Ethanol Usage (mill bu)	Bu/gal EtOH	Ethanol (Mmgal)
Current (05/06)	74.3	148.4	11026.12	1648	2.75	**4532**
10-Year (15/16) High Case *(Based on 10 year yield curve + technology improvements)*	78	193	15054	5954	3.0	**17862**
10-Year (15/16) Medium Case *(Based on 10 year yield curve)*	78	187	14586	5486	2.9	**15909.4**
10-Year (15/16) Low Case *(Based on 15-year yield curve)*	76	178	13528	4428	2.9	**12841.2**

Maximum inclusion of corn can be estimated by maintaining current swine, poultry, and food markets, and decreasing cattle and dairy markets by 50% then utilizing all remaining corn produced. This would withhold approximately 1.5 billion bushels, resulting in total ethanol conversion to 38 billion gallons based on the 10-year yield curve (medium case).

Liquid Transportation fuel market and predictions:

U.S. gasoline demand is estimated at 168.48 billion gallons by 2015, according to the Energy Information Administration. Under our high-case scenario, corn-based ethanol accounts for 10.6 percent of gasoline demand. Using the low-case variables, corn-based ethanol would constitute 5.9 percent of gasoline demand.

Summary:

12.8 to 17.8 billion gallons of fuel ethanol from corn in 10 years is reasonable, provided that infrastructure surrounding increased corn and ethanol production is realized.

12.8 to 17.8 billion gallons constituting 10 percent of the U.S. liquid transportation fuel requirement depends on relative stabilization of the fuel market through increased fuel economy.

NCGA notes that current transportation infrastructure is inadequate for significantly increased corn and ethanol production and that ethanol plant building capacity must increase rapidly to get us to 12.8 to 17.8 billion gallons of capacity by 2015.

Further considerations:

The impact of emerging ethanol conversion technologies (enzymatic or chemical) was not considered in this analysis. These technologies hold the potential to drastically increase plant efficiency and diversify the feedstocks used in ethanol production and co-product displacement capacity of corn.