Construction/Plant Update
Appomattox Bio Energy

BEFORE
ABE Construction Progress

May 2009

July 2009

September 2009
ABE Construction Progress

March 2010

May 2010

July 2010
ABE Construction Complete

January 2011
Located in Hopewell, VA
Capital investment ~$170 million
Products produced:
- 65 million gallons of fuel-grade undenatured ethanol.
- 250 thousand tons of high-value Barley Protein Meal animal feed.
- 65 thousand tons of barley pellets
- 170 thousand tons of carbon dioxide.
Barley Contracting Program
Barley Contracting Overview

- Contracting partner: Perdue AgriBusiness

- Initial new crop program set at 80% of CBOT 2011 corn (JUL11) delivered to Hopewell

- Reduced to 75% of CBOT 2011 corn (JUL11) as of 2.10.11

- Acreage contract: allows producers to lock in price relationship and delivery location

- Producer can price bushels up until time of delivery

- Delivery to plant in Hopewell or Perdue elevators
Osage Bio Energy is developing a market for barley in Virginia and surrounding areas that will provide farmers with a valuable **cash crop** to serve as an alternative feedstock for ethanol production, produce a high-quality barley protein meal for livestock, and provide soil conservation benefits by promoting year-round farming opportunities.

The creation of Appomattox Bio Energy will have an **economic impact in excess of $100 million** on the agriculture community in Virginia and neighboring states, while reversing the trend of declining farm acres.

### USDA NASS – Virginia Statistics

**Barley Planted**

- 2008: 67,000 acres
- 2009: 105,000 acres

57% increase in barley plantings in VA alone.

**Barley planted prior to OBE**

- Highest acreage
- Lower acreage

[www.osagebioenergy.com](http://www.osagebioenergy.com)
2011 contracted acres shown in relation to Perdue and non-Perdue elevator facilities.
Barley related to soybean production

Example of a target growth area
Barley Breeding and Production
Why Barley For Ethanol?

- Barley fits well in Mid-Atlantic cropping production systems in double-cropping systems with soybeans

- Allows growers to double-crop more acres with barley/soybeans and wheat/soybeans because of earlier barley harvest in late May-early June

- Barley prices are tied to corn both as an ethanol feedstock and as livestock feed
  - Ethanol and co-product DDGS feed prices move with corn since corn is the primary feedstock in the US
  - 2011 contract barley pricing is at 80% of corn versus traditional feed prices around 60% of corn
Barley Price Based upon 80% ‘11 Corn

Price

Corn

Barley

$0.00

$1.00

$2.00

$3.00

$4.00

$5.00

$6.00

$7.00

$8.00

$9.00
Barley Research and Development

Double-crop Soybean Cropping Systems
VA Tech Soybean and Small Grain Specialist are completing a two year study on soybean double-cropping systems with barley. This work focuses on intensive crop management and planting date advantages with double-cropped soybeans.

New Barley Varieties
VA Tech’s Small Grain Breeding Program working on new hulled and hulless barley lines for ethanol production. This work also focuses on higher starch and protein barley lines and management practices.

Intensive Management and New Variety Evaluations
N.C. State Small Grain Specialist is initiating work on barley production techniques through nitrogen and fertility practices, plant growth regulators, fungicides, seeding rate studies and new variety evaluations.
Barley fits well in Mid-Atlantic cropping production systems in double-cropping systems with soybeans

Allows growers to double-crop more acres with barley/soybeans and wheat/soybeans because of earlier barley harvest in late May-early June

Provides environmental benefit as a winter commodity cover crop to help meet new water quality mandates related to nutrient management (Chesapeake Bay Act).
‘09 Soybean Yield Results

Suffolk Research Farm
Eunola loamy fine sand

Cropping System
Rye
Barley
Wheat

VA Tech Tidewater Agricultural Research and Extension Center
‘10 Soybean Yield Results

Suffolk
Rains fine sandy loam

VA Tech Tidewater Agricultural Research and Extension Center
## Cropping System Returns

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<tr>
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<th>Estimated Return per Acre</th>
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<tbody>
<tr>
<td>Barley/ Soybeans</td>
<td>Wheat/Soybeans</td>
<td>Soybeans Only</td>
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<tr>
<td>Barley Price</td>
<td>$5.38</td>
<td>Wheat Price</td>
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<td>Yield Per Acre</td>
<td>90</td>
<td>Yield Per Acre</td>
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<tr>
<td>Barley Income</td>
<td>$485</td>
<td>Wheat Income</td>
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<tr>
<td>Soybean Price</td>
<td>$12.91</td>
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<td>Yield Per Acre</td>
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<tr>
<td>Soybean Income</td>
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<td>Total Farm Income</td>
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<td>Total Farm Income</td>
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<td>Per Acre Costs</td>
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<td>Net Income Per Acre</td>
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<td>Net Income Per Acre</td>
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<td>Cash flow per acre</td>
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<td>Cash flow per acre</td>
<td><strong>$440</strong></td>
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<td><strong>(EBITDA)</strong></td>
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<td><strong>(EBITDA)</strong></td>
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Barley Cultivar Development

- Encourage development of high quality characteristics
  - High starch and protein per acre
  - Improved agronomic characteristics to enhance and/or protect starch and protein
  - Disease resistance (*FHB* – *DON* (*deoxynivalenol* / *vomatoxin*); *powdery mildew*; *leaf rust*)
  - Maturity (medium to earlier maturing)

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<thead>
<tr>
<th>Statewide</th>
<th>Yield</th>
<th>Test weight</th>
<th>Starch</th>
<th>2010</th>
<th>2009</th>
<th>2008</th>
<th>2010</th>
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<tr>
<td></td>
<td>bu/ac</td>
<td>lb/bu</td>
<td>% (dm)</td>
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<td></td>
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<tr>
<td>Hulled</td>
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<td></td>
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<tr>
<td>Thoroughbred</td>
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<td>45.2</td>
<td>58.7</td>
<td>54.7</td>
<td>59.2</td>
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<td>VA06B-19</td>
<td>92</td>
<td>46.2</td>
<td>54.9</td>
<td>52.7</td>
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<td>58.5</td>
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<tr>
<td>Hulless</td>
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<tr>
<td>Dan</td>
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<td>VA06H-25</td>
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<tr>
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** 2 year avg yield data (2009-10)**
Preferred Barley Cultivars

- **Thoroughbred** is currently the preferred barley cultivar based upon yield, test weight, starch, protein. It has performed well for the past 7 years but there are some concerns over disease resistance and late maturity.

- The good news is that there is a new line being considered for release this year. **VA06B-19** is a medium maturity (5 days earlier than Tbred), high yielding line from VA Tech. It is one pound higher in test weight at 47 lbs, is highly resistant to powdery mildew and head scab, and resistant to leaf rust. Breeder seed levels are under increase this fall so that Foundation commercial seed will be available to seedsmen fall of 2011.

- **VA06H-25**, a Tbred hulless backcross, is under breeder seed increases this year, with commercial release possible in 2012. Two additional Tbred hulless backcrosses, **07H-31WS** and **07H-35WS**, are under breeder evaluations and seed increases.

- Registered seed of **Price** cultivar planted for seedsmen Certified seed sales Fall 2011. Price is Medium maturity with a good disease resistance package.
Integrated Management
Head Scab Assessment & Monitoring

Fusarium Head Blight Risk Assessment Tool 2009

Virginia Commentary
8 May 2009 - Wheat in many areas of Virginia are at the flowering stage. There have been abundant periods of rain across the Commonwealth over the past 10 days. This has made condition favorable for fusarium head light to occur. There is a period of much warmer temperatures and drier weather to occur by mid-week next week, but infection may have occurred on a third to perhaps two-thirds of the head. Wet conditions in the fields and rain may have not permitted timely applications of a fungicide. In about 3 weeks we will know the extent of the disease in the Commonwealth.

http://www.wheatscab.psu.edu/riskTool_2009.html
Government Relations
The upcoming Farm Bill debate is one of the most important legislative vehicles for advancing policies that can be mutually beneficial to developing robust winter barley acreage.

Unlike the last two Farm Bills, the 2012 Farm Bill will be written at a time when significant additional sources of funding are likely not going to be available. Need policy strategies that have meaningful impact without a big cost associated with it.

Promoting the use of winter barley to produce advanced biofuels speaks to several different priority areas within a Farm Bill.

- There could be a commodity title play with regard to the income safety net surrounding winter barley.

- There is a conservation play because of the important role that winter barley plays addressing runoff on agricultural lands and potential for farmers to receive conservation payments because of these efforts.

- There is an energy title play because of the use of winter barley to produce advanced biofuels.
Osage is heavily engaged with current and potential grain farmers in the Virginia/NC/MD region.

Our new market opportunity stands to drive this region towards meaningful barley production and harvest.

We have the opportunity to influence Farm Bill policy priorities as the Farm Bill debate begins this year and continues in 2012. We want to influence this in a manner that incentivizes market growth in the Mid-Atlantic region.

We want to hear what would be helpful to the National Association and find ways to incorporate those priorities into our thinking in the 2012 Farm Bill debate.
Conclusion

- Osage Bio Energy is the first commercial scale multi-feedstock ethanol processing plant in the United States.

- We seek to revitalize the market for winter barley as a viable East Coast ethanol feedstock while integrating our products into the near-by fuel and animal feed markets.

- Our network of partners allows us great opportunities and promise in what we see as a next generation model.

- We thank you for the opportunity to be with you today!