Maximizing Barley Bioprocessing to Create Food and Fuel
Osage Bio Energy (OBE) is a Virginia-based company that will use regional grain to produce biofuels and related products for East Coast markets. OBE’s sister company, Osage Inc, is also a Virginia-based company and is one of the largest ethanol distribution companies in the Southeast.

Osage Bio Energy is backed by First Reserve Corporation, a leading private equity firm serving the energy sector exclusively, which has committed $300 million to Osage Bio Energy.

In addition to ethanol fermentation, our process captures the naturally occurring, high-value proteins in barley. OBE will use these to provide the livestock industry with a competitively priced, nutritionally superior feed product. Our process also separates the fiber fraction (hulls), making it available in a pellet form for use as a renewable fuel.

Osage Bio Energy’s long range plans include developing projects that evolve from emerging technologies.
OBE’s location in the Mid-Atlantic utilizing winter small grain is unique for ethanol producers.

- Most ethanol producers are located in the Midwest and must ship the ethanol primarily to the East or West Coast where most demand exists.
- Osage Bio Energy intends to procure its feedstock from farmers in barley growing regions on the East Coast.
### Why Barley?

<table>
<thead>
<tr>
<th>Cropland</th>
<th>East Coast Barley</th>
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<tbody>
<tr>
<td>• Additional double-crop agricultural opportunities not presently used during the winter months in Mid-Atlantic and Southeast.</td>
<td>• Barley can be produced in moderately productive soils.</td>
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<td>Farming benefits</td>
<td>• Barley crop is symbiotic with the soybean crop as it reduces double-crop yield drag because of timely harvest (barley) and planting (soybeans behind barley), reduces nitrogen requirements, as well as utilizing the same harvesting equipment.</td>
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<td>• Winter planting reduces the likelihood of off-target impacts from nutrient loss to the environment, enabling better crop nutrient utilization, as well as help with soil and water conservation efforts in sensitive watersheds like the Chesapeake Bay.</td>
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<td>• A challenge is the need for added grain storage.</td>
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<td>Co-product</td>
<td>• Barley Protein Meal - Improved amino acid composition for dairy, poultry and swine.</td>
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<td>• Fuel Pellets – Similar to woodchip pellets for pellet stoves.</td>
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The Agricultural Opportunity

- Each Osage Bio Energy plant will utilize 28 million bushels of barley per year.

- Will require almost 300,000 acres of winter cropland per year for barley.

- Will create over 450 seasonal farm jobs.

- Will provide an economic market value in excess of $100 million annually to growers.

- Will offer over 170,000 tons of barley protein meal per year as poultry and swine rations.

- Will offer over 50,000 tons of renewable fuel pellets per year as a green energy source.
Compared to wheat, double cropping with barley and soybeans provides a longer growing season for soybeans, enabling a higher yield.

<table>
<thead>
<tr>
<th>Soybean Cropping System</th>
<th>Planting Date¹</th>
<th>---Soybean Yield²---</th>
<th></th>
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<tbody>
<tr>
<td>Single-crop</td>
<td>21-May</td>
<td>51.3</td>
<td>100</td>
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<tr>
<td>Double-crop after barley</td>
<td>6-Jun</td>
<td>50.7</td>
<td>99</td>
</tr>
<tr>
<td>Double-crop after wheat</td>
<td>24-Jun</td>
<td>42.5</td>
<td>83</td>
</tr>
</tbody>
</table>

¹Four-year average, 1972-75.
²Average of two soybean varieties

- Trials at Penn State and Virginia Tech show “Thoroughbred” cultivar average ‘s 100 bushels per acre in a double-crop production system.
- 3.3 million acres of soybean production in the region, 2.1 million of which is not currently double cropped.
Locally produced products from regionally grown winter barley offers key environmental advantages

- Winter barley offers cropland soil conservation benefits.
- Local production reduces impact of transporting fuel and livestock feed products from outside the region.
- Barley hull pellets as renewable biomass fuel will offset use of fossil fuels.
- Use of ag-based alternative fuels and ag-based fuel pellets provides greenhouse gas reduction opportunities.
- Ethanol produced will primarily be used in regional fuel markets which are non attainment zones.
Consistent and dependable barley supply is critical. Need to attract the attention of growers and provide assistance with deploying a new crop option.

Need to attract the attention and business of the livestock industry and demonstrate the nutritional value of barley protein meal.

The agricultural industry needs help in facing the challenges associated with introducing a new crop to the area.

Need for increased grain storage to support the new crop production as Virginia’s grain storage deficit is a barrier.
Grain Storage Opportunities

Options include on-farm storage and strategically located grain terminals. Significant incentives exist in the New Market Tax Credit program.

- Offer direct financial incentives targeted at capital construction in rural distressed communities. Net benefit is typically 20%.

- Existing allocations are opening up and a new allocation of $3.5 billion is scheduled for next month.

- Virginia has a relatively weak history in competing for and securing allocations and federal programs like to “spread-the-wealth”.

We expect to start up the plant in Hopewell in Q2 2010.

- Estimated construction time from ground-breaking to operations is 19 months.
- Construction contract signed.
Osage Bio Energy Products:
- Barley Bio Ethanol
- Barley Protein Meal (BPM)
- Barley Fiber Pellets

Agriculture Gains:
- Energy Cash Grain Crop
- Nutritionally Superior Animal Feed
- Barley/Soybean Double Crop Advantage
- Increased Agricultural Revenue