Background

- Row crop production agriculture has a common set of inputs that are used by many of the traditional crops.
- These inputs include fertilizer, seed, fuel, machinery, labor, and land.
- However, each crop uses a different amount of a given input when compared to another crop.
- For example, soybeans use no nitrogen fertilizer while corn uses a large amount of nitrogen fertilizer.
- Thus, as the price of an input changes the profitability of each crop will be affected differently.

Problem

- Fuel is a somewhat unique input for crop production because other input prices are correlated to the fuel price.
- In addition, the fuel price is very variable from year to year which makes estimating the most profitable crop mix difficult.
- This poster examines the profitability of corn, soybeans, and cotton as diesel prices change. Included in the analysis is a stochastic analysis of the variability of fuel prices and the effects on profitability.

Data

- Fuel prices come from the EIA
- Fertilizer prices come from the USDA
- Yearly data for the last 11 years (April of each year)

Procedure

- Estimate the dollars spent on fuel and fertilizer by using the Mississippi State Budget Generator
- Simulate diesel and fertilizer prices for the last 11 years to determine the relationship between diesel and fertilizer prices

Results

- Table 1 shows the dollar amounts of fuel and fertilizer relative to total expenses
- Simulating fuel and fertilizer prices and then comparing the difference between fuel and fertilizer price for each simulated data point shows that the percent change in fertilizer prices is less than one percent lower than the percent change in fuel prices (0.94 correlation).
- Thus if fuel goes up 10%, fertilizer prices are expected to rise by nearly 10%.
- Corn is most affected by fuel changes.

<table>
<thead>
<tr>
<th>Fuel</th>
<th>Corn</th>
<th>Soybeans</th>
<th>Cotton</th>
</tr>
</thead>
<tbody>
<tr>
<td>$40.47</td>
<td>$32.45</td>
<td>$61.08</td>
<td></td>
</tr>
<tr>
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<td>$22.60</td>
<td>$84.50</td>
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<td>$225.64</td>
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<tr>
<td>$545.47</td>
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<td>$766.59</td>
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</tr>
</tbody>
</table>

| Fuel & Ferl as % of Total | 41% | 16% | 19% |

PDF Approximation

Gregory Ibendahl - 2011 AAEA Meetings - Pittsburgh, PA

Note: Cost of production estimates are based on 2010 input prices.