Input Price Volatility
Duane Griffith
Extension Farm Management Specialist

Bozeman, MT
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Types of Volatility

• Price (Demand and Supply)
  – Trend (Up, Down, Sideways)
  – Seasonal
  – Cyclical
  – Random (Information is not perfect = Noise)

• Natural Occurrences
  – Wide Spread Drought and Other…
  – Affects One or More of the Price Patterns

• National and International Policies
Major Sources of Volatility in Expenses

• Operating Costs
  – Fuel
  – Fertilizer
  – Chemicals
  – Labor
  – Others are Smaller Percent of total Expense

• Ownership Costs
  – Machinery and Equipment
  – Land and Improvements
Montana Representative Case Farm

- Fertilizer & Application
- Seed & Treatment
- Chemical & Application
- Repairs and Maintenance
- Machinery Fuel, Oil
- Hired Labor, Farming & Irrig.
- Insurance
- Other Misc. Expenses
Montana Representative Livestock Operation Expenses
No. 2 Diesel, Average Weekly U.S. Retail Price

March 1994 through August 2011
No. 2 Diesel, Average Weekly U.S. Retail Price

Standard Deviation for this period is $0.16 per gallon.

March 1994 through January 2002
No. 2 Diesel, Average Weekly U.S. Retail Price

January 2002 through August 2011

Standard Deviation for this period is $0.85 per gallon.
Urea Annual Price Index Values

Standard Deviation 1990 through 2001 is 10.2

Standard Deviation 2002 through 2010 is 48.7
Phosphates Annual Price Index Value

Standard Deviation
1990 through 2001 is 10.2
2002 through 2010 is 90.5
Mixed Fertilizers Annual Price Index Value

Standard Deviation
1990 through 2001 is **5.9**

Standard Deviation
2002 through 2010 is **43.03**
Agricultural Chemicals Annual Index Value

Standard Deviation 1990 through 2001 is 9.8

Standard Deviation 2002 through 2010 is 47.8
Standard Deviation 1990 through 2001 is 9.7

Standard Deviation 2002 through 2010 is 15.1
Montana Representative Farm/Ranch

- Total Crop Acres 2,525
  - Summer Fallow = 800 acres
  - Alfalfa/Hay = 225 acres
  - Small Grains = 1,500 acres
- 150 Head Breeding Cow Herd Size
- 3,500 Acres Range and Pasture
- Case Farm/Ranch Available at:
  http://www.montana.edu/softwaredownloads/financialmgtdownloads.html
<table>
<thead>
<tr>
<th><strong>Financial Indicator</strong></th>
<th><strong>Initial Case Scenario</strong></th>
<th><strong>Increase Crop Costs 10%</strong></th>
<th><strong>Inc. Crop &amp; Livestock Costs 10%</strong></th>
<th><strong>Decrease Crop and Livestock Revenue 10%</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Current Ratio</td>
<td>1.24</td>
<td>.98</td>
<td>.94</td>
<td>1.77</td>
</tr>
<tr>
<td>Rate of Return on Business Equity</td>
<td>1.19</td>
<td>.16%</td>
<td>.00%</td>
<td>-1.68%</td>
</tr>
<tr>
<td>Net Business Income (Accrual)</td>
<td>$87,033</td>
<td>$54,963</td>
<td>$50,148</td>
<td>-$5,058</td>
</tr>
<tr>
<td><strong>Net Cash Flow</strong></td>
<td>$39,108</td>
<td>$7,038</td>
<td>$2,223</td>
<td>-$52,983</td>
</tr>
<tr>
<td>Net Bus. Income From Operations</td>
<td>.15</td>
<td>.1</td>
<td>.09</td>
<td>-0.01</td>
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<tr>
<td>Operating Loan Credit Score</td>
<td>2.35</td>
<td>2.80</td>
<td>2.80</td>
<td>2.80</td>
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<tr>
<td>Term Loan Credit Score</td>
<td>1.90</td>
<td>2.20</td>
<td>2.20</td>
<td>2.20</td>
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</table>
Strategies for Managing Input Price Volatility

• Fewer Alternatives Than for Prices
• Forward price when financially attractive
  – Understand the current condition
  – Combine with forward pricing output
• Understand price patterns and relationships that may determine futures prices
  – Urea Fertilizer Example
• Be Proactive Regarding Risk Management
Correlation Coefficients for April **Urea Fertilizer Price to Avg. Monthly Cash Price For:**

<table>
<thead>
<tr>
<th>Classes of Wheat</th>
<th>FUTURES</th>
<th>11%</th>
<th>12%</th>
<th>13%</th>
<th>14%</th>
<th>15%</th>
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<tbody>
<tr>
<td></td>
<td>KC</td>
<td>MLPS</td>
<td>ORD</td>
<td>HRW11%</td>
<td>HRW12%</td>
<td>HRW13%</td>
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<tr>
<td><strong>KC</strong></td>
<td>0.642</td>
<td>0.596</td>
<td>0.599</td>
<td>0.598</td>
<td>0.606</td>
<td>0.607</td>
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<tr>
<td><strong>MLPS</strong></td>
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<tr>
<td><strong>ORD</strong></td>
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<tr>
<td><strong>HRW</strong></td>
<td>0.587</td>
<td>0.574</td>
<td>0.578</td>
<td>0.574</td>
<td>0.564</td>
<td>0.564</td>
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<tr>
<td><strong>HRW11%</strong></td>
<td></td>
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<tr>
<td><strong>HRW12%</strong></td>
<td></td>
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<td><strong>HRW13%</strong></td>
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<tr>
<td><strong>DNS13%</strong></td>
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<tr>
<td><strong>DNS14%</strong></td>
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<tr>
<td><strong>DNS15%</strong></td>
<td></td>
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<tr>
<td><strong>GOLDEN TRIANGLE</strong></td>
<td>0.872</td>
<td>0.846</td>
<td>0.805</td>
<td>0.822</td>
<td>0.831</td>
<td>0.832</td>
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<tr>
<td><strong>May</strong></td>
<td>0.732</td>
<td>0.677</td>
<td>0.707</td>
<td>0.704</td>
<td>0.699</td>
<td>0.693</td>
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<tr>
<td><strong>Jun</strong></td>
<td>0.782</td>
<td>0.741</td>
<td>0.731</td>
<td>0.729</td>
<td>0.730</td>
<td>0.732</td>
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<tr>
<td><strong>Jul</strong></td>
<td>0.824</td>
<td>0.808</td>
<td>0.764</td>
<td>0.762</td>
<td>0.768</td>
<td>0.780</td>
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<tr>
<td><strong>Aug</strong></td>
<td>0.809</td>
<td>0.783</td>
<td>0.744</td>
<td>0.738</td>
<td>0.751</td>
<td>0.749</td>
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<td><strong>Sep</strong></td>
<td>0.842</td>
<td>0.811</td>
<td>0.755</td>
<td>0.772</td>
<td>0.789</td>
<td>0.796</td>
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<tr>
<td><strong>Oct</strong></td>
<td>0.861</td>
<td>0.855</td>
<td>0.808</td>
<td>0.765</td>
<td>0.795</td>
<td>0.818</td>
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<tr>
<td><strong>Nov</strong></td>
<td><strong>0.888</strong></td>
<td><strong>0.883</strong></td>
<td><strong>0.805</strong></td>
<td><strong>0.796</strong></td>
<td><strong>0.828</strong></td>
<td><strong>0.856</strong></td>
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<tr>
<td><strong>Dec</strong></td>
<td>0.858</td>
<td>0.842</td>
<td>0.740</td>
<td>0.759</td>
<td>0.794</td>
<td>0.828</td>
</tr>
</tbody>
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Case Farms Used During Presentations

Questions