An Update on Marketing and Economic Research

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Topics

1. How much has the cost of grower inputs increased?
2. What is the cost, carbon footprint, and water footprint of young plants?
3. Do brands really increase likelihood of purchase?
4. How’s the economy and when will the next recession start?
How much has the cost of grower inputs increased?

Proxy measures: ISM Prices Paid Index

>50 = inflationary period
How much has the cost of grower inputs increased?

Proxy measures: Prices Paid vs Received by Farmers

<table>
<thead>
<tr>
<th></th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prices received by farmers</td>
<td>110</td>
<td>99</td>
<td>90.5</td>
<td>95.3</td>
</tr>
<tr>
<td>Prices paid by farmers</td>
<td>113</td>
<td>109</td>
<td>105.5</td>
<td>107.0</td>
</tr>
<tr>
<td>Ratio of received/paid</td>
<td>97%</td>
<td>91%</td>
<td>85%</td>
<td>89%</td>
</tr>
</tbody>
</table>

How much has the cost of grower inputs increased?

NEW measure: Index of Prices Paid by Growers

<table>
<thead>
<tr>
<th>Cost category</th>
<th>% of sales</th>
<th>% of tracked expenses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Containers</td>
<td>4.50%</td>
<td>7.09%</td>
</tr>
<tr>
<td>Media (peat-based)</td>
<td>2.50%</td>
<td>3.94%</td>
</tr>
<tr>
<td>Propagation stock</td>
<td>15.00%</td>
<td>23.62%</td>
</tr>
<tr>
<td>Plant protection products</td>
<td>1.00%</td>
<td>1.57%</td>
</tr>
<tr>
<td>Fertilizers</td>
<td>1.00%</td>
<td>1.57%</td>
</tr>
<tr>
<td>Labor (wages)</td>
<td>22.00%</td>
<td>34.65%</td>
</tr>
<tr>
<td>Fuel/Energy</td>
<td>2.50%</td>
<td>3.94%</td>
</tr>
<tr>
<td>Maintenance</td>
<td>2.00%</td>
<td>3.15%</td>
</tr>
<tr>
<td>Freight and trucking</td>
<td>11.00%</td>
<td>17.32%</td>
</tr>
<tr>
<td>POP, tags, labels, etc.</td>
<td>2.00%</td>
<td>3.15%</td>
</tr>
<tr>
<td>Total</td>
<td>63.50%</td>
<td>--</td>
</tr>
<tr>
<td>Other expenses</td>
<td>36.50%</td>
<td>100.0%</td>
</tr>
<tr>
<td>Total</td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>
Index of Prices Paid by Growers, 2007-2017 (2007=100)

<table>
<thead>
<tr>
<th></th>
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<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Containers</td>
<td>7.09%</td>
<td>100</td>
<td>109.8</td>
<td>98.0</td>
<td>107.9</td>
<td>117.2</td>
<td>119.9</td>
<td>124.1</td>
<td>129.3</td>
<td>116.7</td>
<td>111.2</td>
<td>115.9</td>
</tr>
<tr>
<td>Media (peat-based)</td>
<td>3.94%</td>
<td>100</td>
<td>103.2</td>
<td>90.8</td>
<td>96.9</td>
<td>95.3</td>
<td>95.5</td>
<td>99.1</td>
<td>97.6</td>
<td>110.9</td>
<td>105.5</td>
<td>111.6</td>
</tr>
<tr>
<td>Propagation stock</td>
<td>23.62%</td>
<td>100</td>
<td>102.8</td>
<td>106.7</td>
<td>108.4</td>
<td>111.9</td>
<td>114.2</td>
<td>115.9</td>
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<td>119.5</td>
<td>121.4</td>
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<td>Plant protection products</td>
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<td>100</td>
<td>107.3</td>
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<td>120.7</td>
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<tr>
<td>Fertilizers</td>
<td>1.57%</td>
<td>100</td>
<td>181.7</td>
<td>127.7</td>
<td>117.1</td>
<td>152.4</td>
<td>154.6</td>
<td>147.4</td>
<td>144.1</td>
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<td>118.0</td>
<td>121.3</td>
<td>123.4</td>
<td>128.3</td>
<td>131.4</td>
</tr>
<tr>
<td>Fuel/Energy</td>
<td>3.94%</td>
<td>100</td>
<td>130.2</td>
<td>86.6</td>
<td>107.4</td>
<td>137.2</td>
<td>136.2</td>
<td>135.0</td>
<td>134.3</td>
<td>87.1</td>
<td>76.3</td>
<td>89.7</td>
</tr>
<tr>
<td>Maintenance</td>
<td>3.15%</td>
<td>100</td>
<td>102.9</td>
<td>104.9</td>
<td>106.9</td>
<td>111.2</td>
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<td>116.7</td>
<td>111.2</td>
<td>115.9</td>
</tr>
<tr>
<td>Weighted index (2007=100)</td>
<td>100</td>
<td>107.0</td>
<td>103.1</td>
<td>107.1</td>
<td>112.8</td>
<td>114.8</td>
<td>117.5</td>
<td>120.0</td>
<td>117.4</td>
<td>117.6</td>
<td>121.7</td>
<td></td>
</tr>
<tr>
<td>YOY increase/decrease</td>
<td>---</td>
<td>7.02%</td>
<td>-3.66%</td>
<td>3.86%</td>
<td>5.34%</td>
<td>1.79%</td>
<td>2.30%</td>
<td>2.16%</td>
<td>-2.14%</td>
<td>0.18%</td>
<td>3.43%</td>
<td></td>
</tr>
</tbody>
</table>

Index of Prices Paid by Growers, 2007-2017 (2007=100)
What is the cost, carbon footprint, and water footprint of young plants?

- FNRI & SCRI & HRI funding
- Economic engineering approach.
- Representative growing/irrigation BMPs.
- 3-gal woodies on East and West Coast.
- Young plants, Annuals (Begonias), Potted Flowering (Poinsettias), Outdoor (Mums)

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Young Plants -- Modeled 2 systems

**System A**
- Older, heated GH with natural gas, gutter-connected, rounded arch, no ridge vent
- Double-layer poly on roof; bi-wall polycarbonate on sides; shade cloth inside the house
- Overhead spray nozzles; well water

**System B**
- Modern, gutter-connected, Dutch-style greenhouse, water captured from roof
- Ebb-flood irrigation, storage tank + supplemental well water (+ calcium hypochlorite)
- Returning water filtered & chlorine added
**SYSTEM A**

- **Total GWP = 4.225 kg CO₂e/kg**

**SYSTEM B**

- **Total GWP = 2.276 kg CO₂e/kg**

46% lower than Sys A
Results & Discussion

- Carbon footprint was 46% lower with System B; Costs were almost $0.40/tray lower.
- Natural ventilation in System B = decreased electricity use for exhaust fans and evaporative cooling vs. System A.
- Less fertilizer costs for the subsurface irrigation method in System B than the overhead irrigation in System A.

Results & Discussion

- Water use for misting was similar between the systems at approximately 25 L per tray
- Production water use was greater in System A (64L/tray) than in System B (21L/tray). This would be expected given the recycling of water in the ebb-flood system.
- Interestingly, the water requirements for evaporative cooling was greater than for irrigation in both models.
- Net present value likely higher for System B.
Why does this matter?

Sustainable messages increase LTB and WTP.

1. Biodegradable & recyclable containers
2. Pollinator-friendly
3. Water and energy conserving
4. Carbon neutral or saving
5. Functional benefits (e.g. VOC removal)

Do brands really increase likelihood of purchase?

Wine labels:
- Pictorial & text branding to capture attention
- Images of animals & plants
Intrinsic cue
(attributes inherent to the product)

Extrinsic cue
(packaging, branding, labeling, attributes outside the product)

Influence of brands?

4x3x4 factorial design
Results & Discussion

- 87.4% agreed that “Plants don’t need to have a brand name to be high quality.”

- Majority disagreed that “Well-known national brands are best for me.”

- 60% place more emphasis on the retail outlet rather than the brand.

Results & Discussion

- Conjoint analysis showed that the type of plant influenced 55.3% of the purchasing decision, followed by price (27.1%), then brand (17.6%).

- 3 distinct clusters
  - Brand savvy buyers (17.2%) – older, spent most
  - Brand unaware, non-buyers (52.3%) – youngest, spent least
  - Brand reliant buyers (20.3%) – intermediate age & spending
Results & Discussion

- Visual behavior was consistent across clusters.
- All brands (even fictitious) attracted attention.
- Branded plants viewed faster.
- TFD = PW > Unicorn > Monrovia > Generic => **TFD did not predict LTB** (info processing vs confusion?).
- Consumers varied in their level of brand recognition, awareness, and purchase intention. Mean purchase intention was similar, however, for branded and generic products.

How’s the economy and when will the next recession start?

First, stock market performance **does not** equal economic performance.

Second, consumer confidence **does not equal** economic performance.
Regional differences do exist

2% is “slow and steady!”
Housing market

- LMI ↑ for 89% metro areas
- Home prices up 5.8% YOY
- YOY inventory ↓ 26 months
- Certain MSA’s skewing the avg.
- Geographic mismatch
- Rising number of 1st-time buyers

HEADWINDS

- Hurricane delays
- Lack of existing home turnover
- Lumber prices are up
- Shortage of lots
- Labor availability

Other current economic conditions

- GDP ~ 2.0% (1.4%Q1, 3.1%Q2)
- Job growth slowing
- Leading economic index positive (9th year)
- ISM manufacturing at 3-year high
- Consumer confidence holding
- Fuel prices remain low
- HH debt at all-time high
- Retail sales growing (slowly)
- International forecast better
When will the next recession start?

![Graph showing the St. Louis Fed Financial Stress Index](source: fred.stlouisfed.org)
15% chance of recession before this time next year

CETERIS PARIBUS
Questions?

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