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Communicating with Data: Pipelines and Pitfalls

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Footprints in the field 2000 → 2020

- Improved detectors
- Development of precision ag
- Data capture and processing
- Power scouting that is GPS guided and sensor driven
Data Pipeline

- Data collection
- Classification
- Interpretation
- Delivery
- Implementation
- Effect

- Sensor type, frequency
- Algorithm, timeline
- Cookbook or custom
- Digital/analog?
- Final use.
- What was it worth?
Detection of Fairy Ring Disease in Cranberry

Drone provides 3-4 year improvement in detection

```
<table>
<thead>
<tr>
<th>Ring ID</th>
<th>Ring Area (ft)</th>
<th>Ring Area (acre)</th>
<th>Water Volume (gal)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>998.62</td>
<td>0.02</td>
<td>199.72</td>
</tr>
<tr>
<td>11</td>
<td>950.41</td>
<td>0.02</td>
<td>190.08</td>
</tr>
<tr>
<td>12</td>
<td>700.72</td>
<td>0.02</td>
<td>140.14</td>
</tr>
<tr>
<td>13</td>
<td>776.43</td>
<td>0.02</td>
<td>155.29</td>
</tr>
<tr>
<td>14</td>
<td>1423.46</td>
<td>0.03</td>
<td>284.69</td>
</tr>
<tr>
<td>Total</td>
<td>4849.63</td>
<td>0.11</td>
<td>969.93</td>
</tr>
</tbody>
</table>
```
Detecting stem blight in blueberry

### Orthomosaic Imagery

**Altitude:** 61m

## Classification

### Quantification of Area

<table>
<thead>
<tr>
<th></th>
<th>Entire Field</th>
<th>Pixel Count</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bare Ground</td>
<td></td>
<td>44239219.00</td>
<td>44.63</td>
</tr>
<tr>
<td>Potential Stem Blight</td>
<td></td>
<td>350032.00</td>
<td>0.35</td>
</tr>
<tr>
<td>Healthy vegetation</td>
<td></td>
<td>54531334.00</td>
<td>55.02</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>99120585.00</td>
<td>100.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Single Row</th>
<th>Pixel Count</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bare Ground</td>
<td></td>
<td>449608.00</td>
<td>37.81</td>
</tr>
<tr>
<td>Potential Stem Blight</td>
<td></td>
<td>12599.00</td>
<td>1.06</td>
</tr>
<tr>
<td>Healthy vegetation</td>
<td></td>
<td>726768.00</td>
<td>61.13</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>1188975.00</td>
<td>100.00</td>
</tr>
</tbody>
</table>

**Figure 9.** Tables 1 & 2 show the extracted pixel counts from both the field and row extraction.
Estimation of crop size and exposure

Estimation of crop

Average berry weight (BWT) at harvest:
  (cv Mullica Queen) 2.1g
Berry count/square meter (BC)
  is calculated from imagery

BC*BWT*10 = Yield (kg/ha)
Where are the opportunities?

Available Now
• Acreage Mapping
• Estimating Losses
• Validating Soils Maps
• Disease Identification
• Scouting Efficiency

In Development
• Vegetation Maps
• Creating Yield Maps
• Estimating Yields
• Scouting and Deep Learning