Team #858

Flora Pulse

Microchip implant that measures thirst of a plant in realtime.

Total interviews: 111
In-person: 74
Initial guesses...

Key Partners:
- Foundry
- Contract manufacturer
- Plant Scientists
- Wireless hardware
- Crop consultants

Key Activities:
- Manufacture
- Data collection and analysis
- Research & Development

Value Proposition:
- Cutting-edge fruit quality
- Realtime info = better
- Higher yield, consistency

Customer Relationship:
- Excellent customer
- Partner with consultant & growers
- Trade shows
- Scientific research and development

Customer Segmentation:
- Woody crop growers
- Commodity crop growers
- Concrete/food processing

Key Resources:
- Engineering know-how
- Plant science know-how
- CNF
- Patents

Channels:
- Data on web + iPhone

Cost Structure:
- Manufacture
- Customer support
- Research & Development

Revenue Streams:
- Data subscription
- Hardware sale
Hypothesis: everyone hates the current method. We will replace it.
WHAT IS THE PRESSURE BOMB?
WHO WOULD EVEN USE THAT?

WOOPS! Nobody cares in the east coast -> it rains too much. Nobody irrigates
33 days on the road
2,500 miles driven
Week #2 to #4 – Napa Valley

2 acres, $40/bottle

400 acres, $300/bottle

>10,000 acres managed
EVERYONE wants something different?!??

<table>
<thead>
<tr>
<th>Value Propositions</th>
<th>Customer Relationships</th>
<th>Customer Segments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Replace the pressure bomb - better accuracy, reputation</td>
<td>Excellent customer service = Word of mouth</td>
<td>Outside vineyard mgmt company/consultant</td>
</tr>
<tr>
<td>2. Better service to vineyard accounts</td>
<td>Partner w/ consultant &amp; management Co</td>
<td>Vineyard owner, only grows grapes</td>
</tr>
<tr>
<td>3. Cutting-edge fruit quality + reputation</td>
<td>Trade shows</td>
<td>In-house vineyard manager for integrated</td>
</tr>
<tr>
<td>4. Less water use, runoff, leaching. Eco-friendly</td>
<td>Scientific research and publications</td>
<td>Woody crop growers (fruit, nut, cotton)</td>
</tr>
<tr>
<td>5. Realtime info = better decisions</td>
<td>Media &amp; PR</td>
<td>$25—$75 vineyard manager/consultant</td>
</tr>
<tr>
<td>6. Prevent crop loss: waterlogged, disease</td>
<td>Data on web + iPhone (built in-house)</td>
<td>Small/medium vineyard management</td>
</tr>
<tr>
<td>7. High-tech image</td>
<td>Direct installation + maintenance.</td>
<td>Commodity crop growers - irrigated</td>
</tr>
<tr>
<td>8. Higher yield, consistency</td>
<td>Authorized service representative (install + maintain)</td>
<td>High-tech management company</td>
</tr>
<tr>
<td>9. Prove/know that grapes are grown correctly</td>
<td>Third-party PC/phone software</td>
<td>Landscaping, golf courses</td>
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</tbody>
</table>

Need to simplify
Not interested...

Traditional growers

Antinori family = 630 years

“What we are doing works just fine.”

DIY small operations

LauraMichael Wines

“Our 2-acre vineyard is in the backyard, can just go take a look at any time”

< $1,000/ton growers

Samantha Horn, grape buyer

“The lower-end growers are just looking for yield, barely break even. Water those grapes!”
“Our management company has not recommended we use a Pressure Bomb, so we haven’t”.

THANKS LAURA!!!
INSIGHT #1: Management companies - PAIN

“HELP ME DULL THE PAIN!”

Drive around hours.

Employees could use time better.

“I will buy everything you got”

>10,000 acres

Michael Wolf vineyard management
INSIGHT #2: Water BIG problem... some places

What drought? (everyone)

*Unanimously*
Water is our biggest challenge: quality and quantity.
- Bradley Higbee, Wonderful Co

MAYBE WE CAN TACKLE THESE HUGE MARKETS!!!!
(Nuts and fruits)

I’m spending 48% of my total budget... on water.
- John Burr, Avocado grower
Expand the market

2 value propositions

Improve grape quality
less labor

Improve water use efficiency
‘crop per drop’

Premium vineyards
> $2000/ton

Woody crops in water-scarce areas
(fruits, nuts)

Growers are trying many different solutions...
All have BIG problems.
Went to meet the competition @ trade show

I got their hat!

Learned:
- ‘Competitors’ could be partners or coopetitors
- Even the competition is friendly
### Meet the competition – mkt feedback

<table>
<thead>
<tr>
<th>Company</th>
<th>Sensor</th>
<th>Pros</th>
<th>Cons</th>
<th>Mkt penetration</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jain Irrigation</td>
<td>Soil moisture</td>
<td>Tried and tested technology</td>
<td>Inaccurate, must be calibrated to soil</td>
<td>Large</td>
<td>$1500/year/install</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$?/acre</td>
</tr>
<tr>
<td>TerrAvion</td>
<td>Aerial imaging w/ airplanes</td>
<td>Cover large acreage</td>
<td>“Pretty pictures, not actionable”</td>
<td>Many testers</td>
<td>$30/year/acre</td>
</tr>
<tr>
<td>Tule</td>
<td>Evapotranspiration</td>
<td>Averaged over 10 acres, how much water used</td>
<td>Does not tell plant water-stress</td>
<td>Small</td>
<td>$1500/year/install</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$300/year/acre</td>
</tr>
<tr>
<td>Fruition Sciences</td>
<td>Sap flow</td>
<td>Fancy new tech, cool, continuous reading</td>
<td>‘Debunked’</td>
<td>Very small</td>
<td>$5,000/install</td>
</tr>
<tr>
<td>Phytech</td>
<td>Dendrometer</td>
<td>Continuous data, see patterns</td>
<td>Unclear what a particular value means</td>
<td>Very small</td>
<td>?</td>
</tr>
</tbody>
</table>
Distribution – doing it wrong

Vineyard consultant

Website/Google

Vineyard manager

Sensor

Install

RF

Maintenance

Weather station

Cellphone app

Cellular modem

Cloud database

Laptop website
INSIGHT #3: Key people are information/product channels

Vineyard managers
Michael Swanton

Management/consultant companies
Mike Wolf

Plant water-stress expert
Prof. Ken Shackel (UC Davis)

trust
PRODUCTS

trust
INSIGHT #3: Key people are information/product channels

- Vineyard managers: Michael Swanton
- Management/consultant companies: Mike Wolf
- Woody crop growers: Hal Crain
- UC Extension: Mark Battany
- Plant water-stress expert: Prof. Ken Shackel (UC Davis)

Connections:
- Trust from Michael Swanton to Mike Wolf
- Trust from Mike Wolf to Mark Battany
- Trust from Mark Battany to Hal Crain
- Trust from Hal Crain to Prof. Ken Shackel (UC Davis)
Reinvent wireless transmission? I THINK NOT!

**Multitech**

- $600 repeater
- $30/modem
- $360/year for data
- Some installation costs

*Used by -> WaterBit*

**Verizon**

- $6/modem
- $10/device/year for data
- Works anywhere with cel reception

*Used by -> itk*
Managers want ‘full solution’ -> nothing less

JOB THEY ARE TRYING TO DO:
Irrigate: when, where and how much.

MONEY

Sensors installed

Simple, powerful UI

Turnkey solution. Follow Tule’s example (growers only had good things to say about them)
Initial Market Size (from USDA Survey)

USA Irrigated Fruit
5M acres
$250M

Currently use sensors
750,000 acres
$37.5M

$50/acre
NEXT STEPS – Develop tech for 2 value props

1. Sensor CAN reliably replace the Pressure Bomb.

2. Information DOES help growers improve water use efficiency.

Technical video: https://youtu.be/O7BH6NHGmI0
Lessons learned video: https://youtu.be/IFu-vS3lO7k