ADAPTIVE
EQUIPING THE INDUSTRY OF THE FUTURE

Matt Strmiska
Almond Pest and Weed Management
Practical Applications in Trees
**Integrated Pest Management**

IPM is an ecosystem-based strategy that focuses on long-term prevention of pests or their damage through a combination of techniques such as biological control, habitat manipulation, modification of cultural practices, and use of resistant varieties. Pesticides are used only after monitoring indicates they are needed according to established guidelines, and treatments are made with the goal of removing only the target organism. Pest control materials are selected and **applied in a manner** that minimizes risks to human health, beneficial and non-target organisms, and the environment.

Do our operations reflect this?
The Missing Link in IPM

- Target Specific Pesticides
- Biological Control
- Habitat Manipulation
- Cultural Practices
- Competitive Varieties
- Broad Spectrum Pesticides
- Application

Operational Decision Making
Our Mission — Operation Consultation

We exist to develop innovation, techniques, and processes for the agricultural industry for the achievement of true sustainable farming.

- Less Pesticides
- Shift of Operation Standards
- Accountability For Investors
- Increased IPM
- Asset Protection
- Employee Retention

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Where
Theoretical Intersects Practicality
**Tolerance or Resistance**

**Tolerance** is the natural ability of a species to withstand the specific effects of a particular chemistry.

“It doesn’t quite work like it used to.”

**Resistance** is the forced change in the genetic makeup of a population in response to selection of a resistant gene pool by chemistry exposure.

“It isn’t even phased by it anymore.”
**Factors at Play**

Take control of the things you **CAN**

Spray...
- at right time
- in right environmental conditions
- with full rate of pesticides
- based on your canopy or target structure
- **without trying to break laws of physics**

Don’t assume...
- your speedometer/computer is accurate
- your psi gauge is accurate
- your final nozzle output is accurate

Credit – Dr. Jason Deveau, 2009

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**Significance of Droplet Design**

**Volume Mean Diameter**

"VMD" or "DV0.5"

1/2 of spray volume = smaller droplets

1/2 of spray volume = larger droplets

"DV0.1"

10% of volume contains droplets smaller than *this* micron size.

"DV0.9"

90% of volume contains droplets larger than *this* micron size.
Weed IPM
Why we must care
Glyphosate resistance
# Weed Pest Organisms

They breed with only survival “in mind.” Your crop is only another competitor and a weak one at that because your crop is not bred for survival.

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Reasons to Care</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Abundant seed production</td>
<td>a) Competition: light, nutrients, water</td>
</tr>
<tr>
<td>b) Rapid population establishment</td>
<td>b) Reduction in crop yield</td>
</tr>
<tr>
<td>c) Seed dormancy</td>
<td>c) Host insects and diseases</td>
</tr>
<tr>
<td>d) Long-term survival of buried seed</td>
<td>d) Negative economic impact</td>
</tr>
<tr>
<td>e) Adaptation for spread</td>
<td></td>
</tr>
<tr>
<td>f) Presence of vegetative reproductive structures</td>
<td></td>
</tr>
<tr>
<td>g) Ability to occupy sites disturbed by human activities</td>
<td></td>
</tr>
</tbody>
</table>
coverage requirements

Contact
- Very fine/Fine
- Fine/Medium

Systemic
- Medium/Coarse
- Coarse/Very coarse

Soil Applied
- Very coarse/Extra Course

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Redefining Coverage for Foliar
Redefining Expectations

1 2 3 4 5 6

0.5% 3% 30% 50% 80% 100%

[Images of leaves with varying degrees of damage]
Science of Spraying

Physics/Engineering

Fluid Mechanics

Fluid Dynamics

Aerodynamics

Spraying over target
No coverage
Poor coverage
Marginal coverage
Good coverage
Drenching - runoff
Spraying under target

Industry Normal

Excessive blow through
Standard Loss at Suture 97-99%

ADAPTIV has learned how to double and even triple the quantity delivered.
Results-Driven Data

Sodium Molybdate Deposition Analysis (µg Mo/cm²)

High = 7.6m in walnuts and 6.7m in almonds
Low = 3m in both walnuts and almonds

Trial Data from 2016 CCFS Nealta – Jim Cook
Trial Data from 2017 ADAPTIV Miticide – Matt Strmiska
All SoMo analysis done by UC Davis – Franz Niederholzer
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WRAP TREES
DO NOT SPRAY
EVERY OTHER ROW
# Results-Driven Data

<table>
<thead>
<tr>
<th>Life Stage</th>
<th>Sides Sprayed</th>
<th>Kill % (sample size)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adult</td>
<td>Both/Wrap</td>
<td>68.98% (232)</td>
</tr>
<tr>
<td></td>
<td>One/Every Other</td>
<td>33.33% (24)</td>
</tr>
<tr>
<td>Egg</td>
<td>Both/Wrap</td>
<td>95.37% (2,050)</td>
</tr>
<tr>
<td></td>
<td>One/Every Other</td>
<td>70.00% (200)</td>
</tr>
</tbody>
</table>
Results-Driven Data

NOW Kill – Altacor 4.5oz / 133mL

<table>
<thead>
<tr>
<th>Speed</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.4 - .0 kph</td>
<td>100.00%</td>
</tr>
<tr>
<td>3.2 - 3.7 kph</td>
<td>80.00%</td>
</tr>
<tr>
<td>4.0 kph</td>
<td>60.00%</td>
</tr>
<tr>
<td>4.8 kph</td>
<td>40.00%</td>
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<tr>
<td>5.6 kph</td>
<td>20.00%</td>
</tr>
</tbody>
</table>
Results-Driven Data

100 Hull Split Trials - 2014

133 mL/ac Altacor
3.2 kph

Engine Drive

PTO Drive

Percent Kill

Sample Height

1.8m 3.0m 4.6m 6.1m 7.6m

6' 10' 15' 20' 25'

71% 78% 69% 67% 57%

67% 54% 55% 39%

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## Results-Driven Data

<table>
<thead>
<tr>
<th>Intrepid mL/ac</th>
<th>Speed KPH</th>
<th>Kill (%)</th>
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</thead>
<tbody>
<tr>
<td>355</td>
<td>3.0</td>
<td>32</td>
</tr>
<tr>
<td>355</td>
<td>3.2</td>
<td>34</td>
</tr>
<tr>
<td>355</td>
<td>3.2</td>
<td>41.3</td>
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<tr>
<td>355</td>
<td>3.5</td>
<td>38.5</td>
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<tr>
<td>355</td>
<td>3.5</td>
<td>44.3</td>
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<tr>
<td>414</td>
<td>3.2</td>
<td>67.3</td>
</tr>
<tr>
<td>414</td>
<td>3.4</td>
<td>67.3</td>
</tr>
<tr>
<td>414</td>
<td>4.3</td>
<td>46.7</td>
</tr>
<tr>
<td>710</td>
<td>3.2</td>
<td>72</td>
</tr>
<tr>
<td>710</td>
<td>3.2</td>
<td>78</td>
</tr>
<tr>
<td>710</td>
<td>3.4</td>
<td>83.3</td>
</tr>
</tbody>
</table>
# Formulations

<table>
<thead>
<tr>
<th>Formulation</th>
<th>Inhalation Hazard</th>
<th>Hard on Equipment</th>
<th>Forms True Solution</th>
<th>No Agitation Needed</th>
<th>Easily Clogs</th>
<th>Drift Potential</th>
<th>Easy to Use</th>
<th>Difficult to Mix</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wettable Powder</td>
<td>★★</td>
<td>★★</td>
<td>★★</td>
<td>★</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Soluble Powder</td>
<td>★★</td>
<td>★★</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Water-Dispersible Granule</td>
<td>★★</td>
<td></td>
<td>★★</td>
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<td></td>
<td>★★</td>
<td>★★</td>
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<tr>
<td>Water-Soluble Concentrate</td>
<td>★★</td>
<td>★★</td>
<td></td>
<td></td>
<td></td>
<td>★★</td>
<td>★★</td>
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<tr>
<td>Emulsifiable Concentrate</td>
<td>★★</td>
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<td>★★</td>
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<td>★★</td>
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<tr>
<td>Flowable</td>
<td></td>
<td></td>
<td>★★</td>
<td></td>
<td></td>
<td>★★</td>
<td>★★</td>
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<tr>
<td>Aqueous Suspension</td>
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<td>★★</td>
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</tbody>
</table>
Simple Steps in Any Operation

Allow enough time for:

- Scheduling and planning the application
- Obtaining the products
- Setting up the application date
- Weather delays or maintenance problems, if necessary
- Calibrating equipment
- Planning spray route from beginning to end with IPM in mind

When the decision is made to spray “RIGHT NOW,” high chance of failure.
Launching New Services in Australia!


RETHINK THE MEANING OF “GOOD ENOUGH!”

hello@adaptiv.us
Find out how we can help you.

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