

Air Blast Sprayer Optimization Protects Central Valley Water Quality

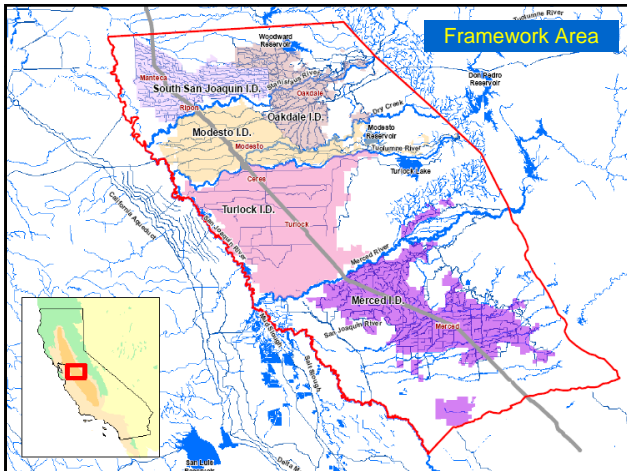
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Blankinship & Associates, Inc.
Agricultural & Environmental
Consultants

East San Joaquin Water Quality Framework



East San Joaquin Water Quality Framework Project's Objectives:

- Support Irrigated Lands (Ag Waiver) Program
- Provide data for TMDLs
- Collect data on potential water quality problem areas
- Provide information to differentiate pollutant sources (ag v. urban)
- Focus future efforts
- Evaluate effectiveness of management practices

Evaluation of Management Practice Effectiveness: Air Blast Sprayer Calibration



Air Blast Sprayer Calibration



Background

- Almond Crop Value: \$2.1 Billion in 2007
- Sprayers used for dormant- and in-season application
- Average Annual Use in Framework Area
 - Chlorpyrifos: 131,000 lbs
 - Diazinon: 26,000 lbs
- Historic surfacewater detections > TMDLs

Water Quality Data: Diazinon & Chlorpyrifos > TMDLs

- 82 samples collected from irrigation systems in Framework Area (12/05 – 8/06)
- Diazinon (TMDL = 0.16 µg/L)
 - ~16% of samples exceeded TMDL objective in stormwater season (Dec - March)
 - No samples exceeded TMDL objective in irrigation season
- Chlorpyrifos (TMDL = 0.025 µg/L)
 - ~10% samples exceeded TMDL objective (March and June)
 - Detected in 13% of samples in irrigation season



Air Blast Sprayer Calibration



- **Objective:** Improve sprayer accuracy and efficiency
- **Method:** Three Step Process:
 1. Pre: Measure Uniformity, Nozzle Output, Distribution
 2. Adjust/Repair
 3. Post: Remeasure Uniformity, Nozzle Output, Distribution

Airblast Sprayer Calibration

- **Step #1: Measure 3 things:**
 - Uniformity (Left v Right)
 - Nozzle Output (gpm) Relative To Manufacturer's Specifications
 - Tree & Canopy Distribution





Airblast Sprayer Calibration

- Step #2: Make improvements & adjustments:
 - Replace/Clean Nozzles
 - Replace Orifices
 - Adjust Deflector fins

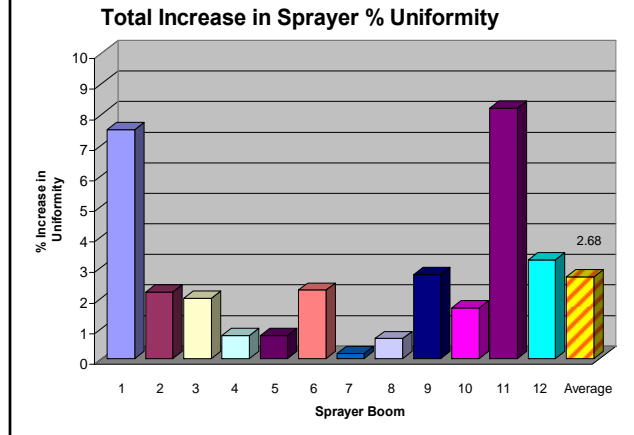
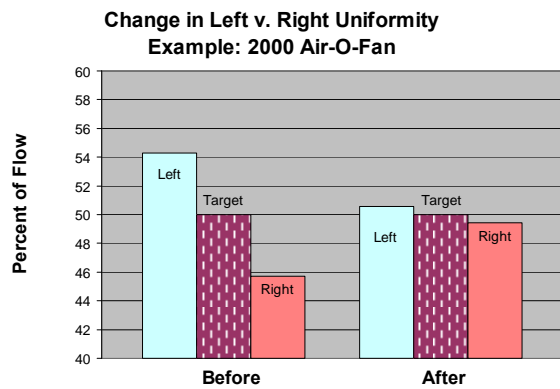


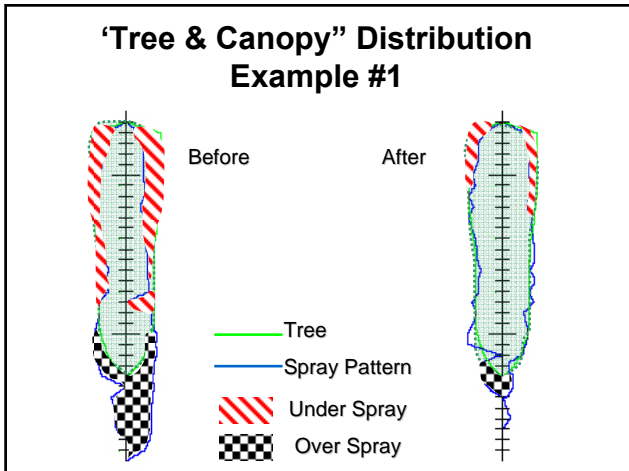
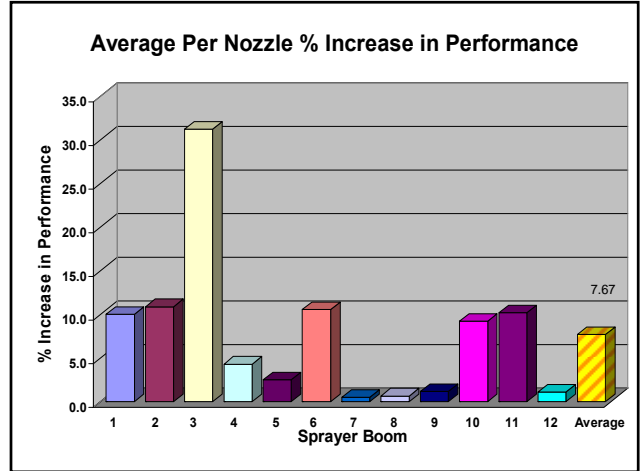
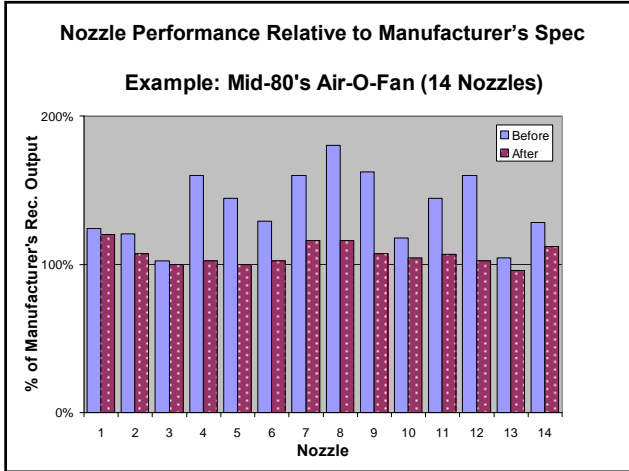
Airblast Sprayer Calibration

- Step #3: Re-Measure:
 - Uniformity (Left v Right)
 - Nozzle Output (gpm) Relative To Manufacturer's Specifications
 - Tree & Canopy Distribution

Airblast Sprayer Calibration

- Results:
 - Uniformity
 - Nozzle Output
 - Distribution





- Airblast Sprayer Calibration Conclusions**
- Uniformity: ↑ 2.7%
 - Nozzle Output Efficiency: ↑ 7.7%
 - Distribution: Improved
 - Less Ground Deposition = Less Potential Surfacewater Impact
 - Better Coverage = Better Control
 - Grower Cost Savings



Questions?

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