

# Progress in the Use of a Spray Table to Simulate Aerially-applied Plant Deposits to Determine Efficacy

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# Objective

- To update you on what we have been doing this previous year on all aspects related to the use of a spray table to determine the effects of deposition pattern on plants of simulated aerial applications on efficacy of insecticides for controlling insect pests primarily on cotton and corn.

# Components of Spray Table Research

- Problems
- Pests
- Pesticides
- Plants (Crops)
- Spray Table Calibration
- Pesticide Efficacy Determinations
- Aerial Field Applications
- Field Efficacy Verification

# Problems

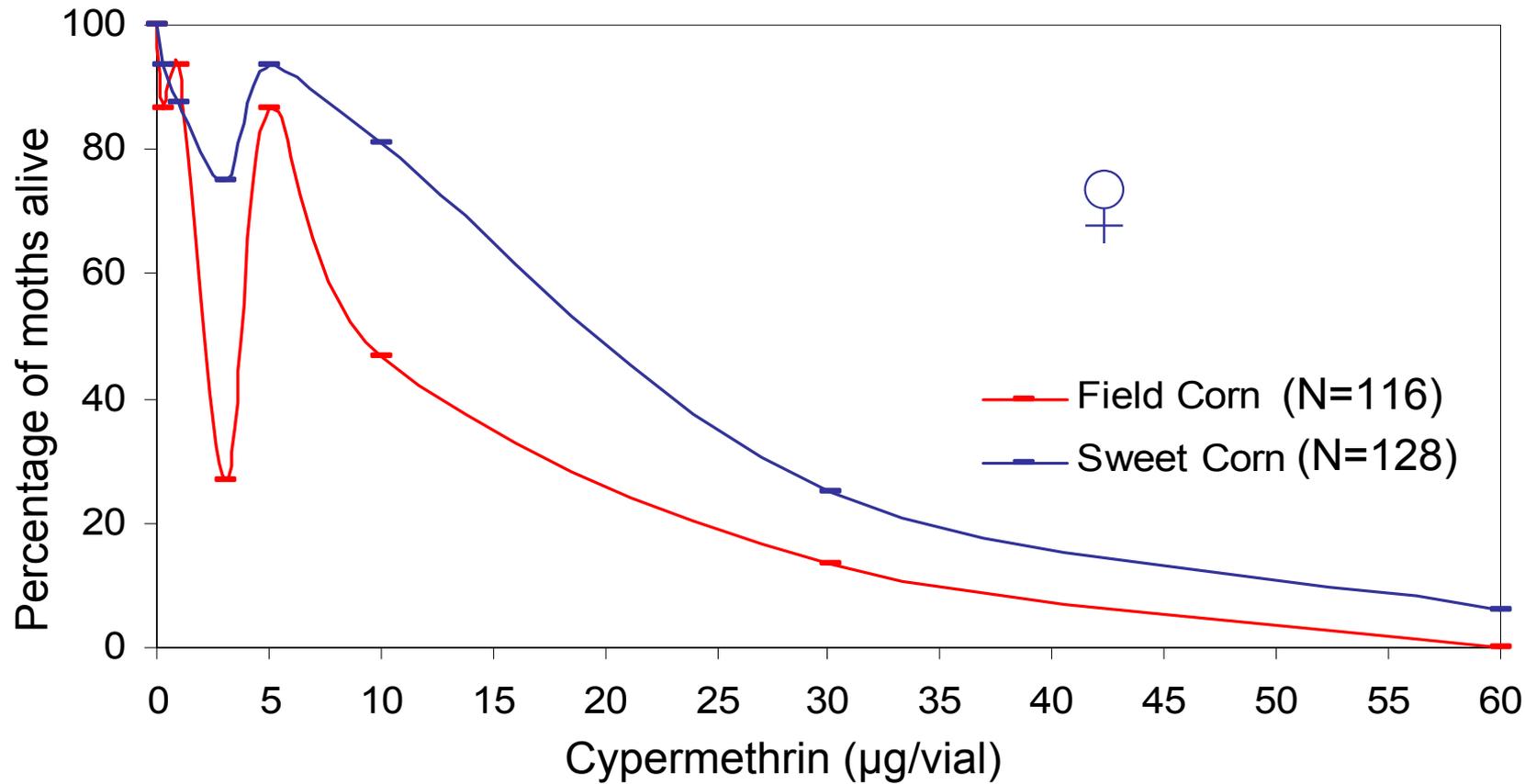
- Initial problem looked at was the effect of spray rate using 2 different nozzles on the spray table to control various cotton insect pest species with a variety of recommended or labeled insecticides.
- We want to expand this to include very definite deposition patterns on cotton and corn relative to droplet size spectrum and density.
- Need input from you about any specific aerial application problems that you are having that we can look at via use of the spray table or other capabilities.
- Example – problems with control of corn earworm on sweet corn at Olathe, CO identified because of conversation at the last NAAA convention with Leonard Felix.

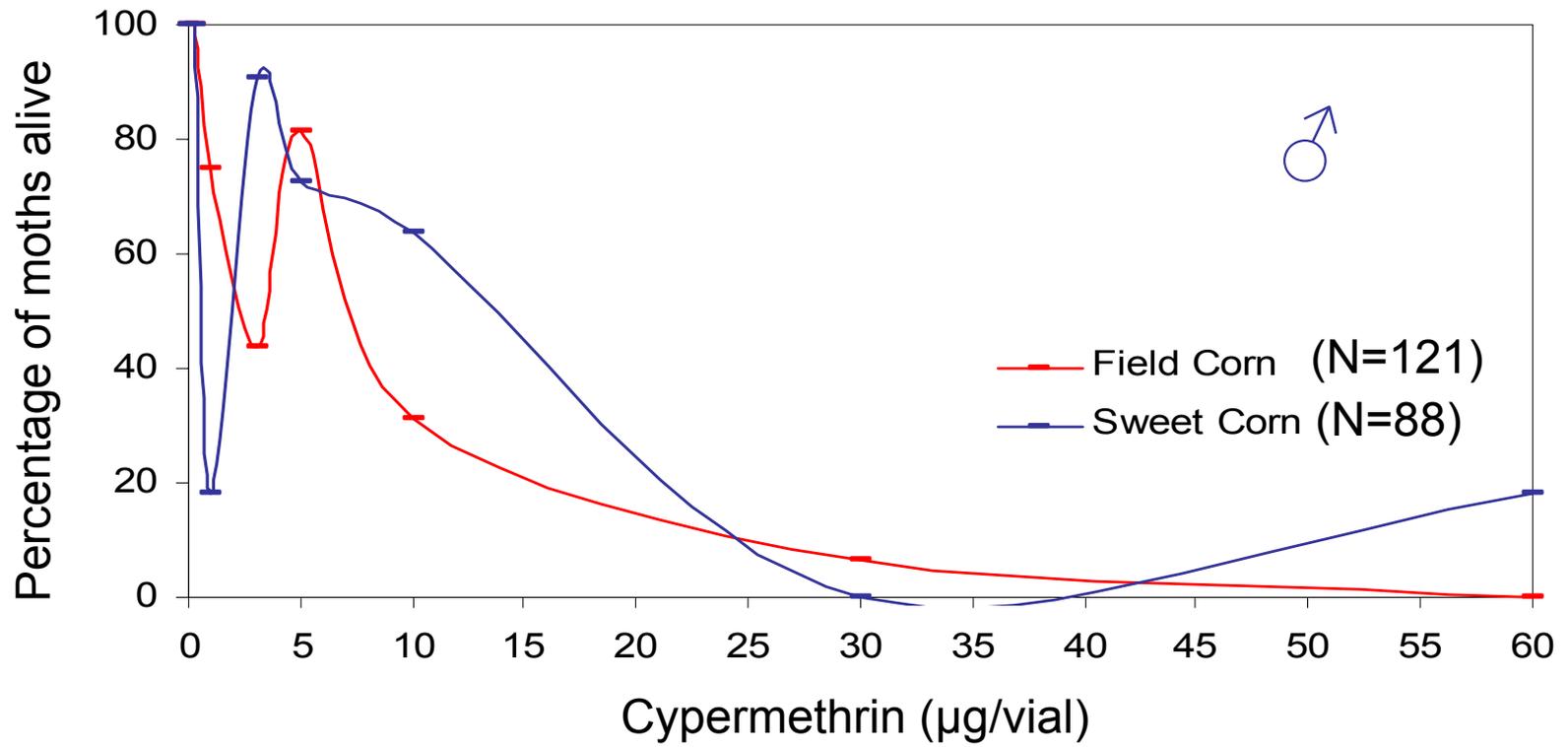
# Corn Earworm Control Problem on Sweet Corn

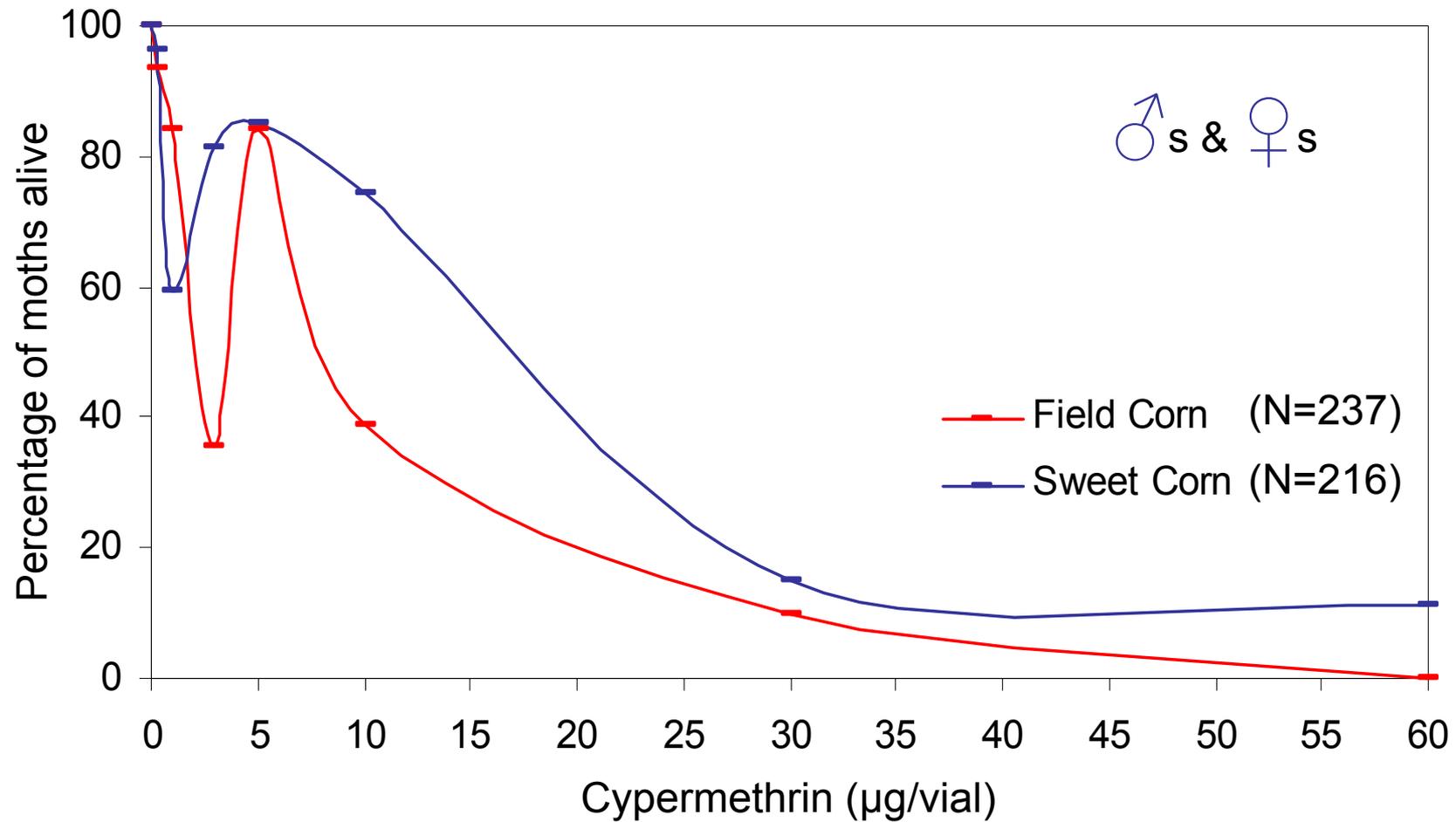
- Visited Olathe during growing season.
- Learned about aerial application of pesticides for control of corn earworm and sweet corn production.
- Concern - Potential migration of resistant corn earworm moths from cotton in Arizona.
- Use of Lannate LV as an ovicide/larvicide and Warrior as a larvicide at 10 gpa and small droplets.
- Problem? Coverage, Resistance, Spray Interval, etc.

# Corn Earworm Control Problem on Sweet Corn

- Larvae collected from treated sweet corn and field corn, placed on artificial diet and sent to College Station.
- Larvae reared to the adult stage, confined with corn ears to lay eggs because too few adults to test.
- Larvae reared to the adult stage, sexed and tested when 2-3 days old.
- Adult Vial Technique or Test (AVT) used to evaluate response to technical cypermethrin.
- Lethal Concentration 50% ( $LC_{50}$ ) = 0.09 to 0.44 ug/vial (Moth Source - Texas Brazos Bottom 1988,89 & 93.)







# Corn Earworm Control Problem on Sweet Corn

- Discriminating dose with AVT between resistant and susceptible corn earworm adults for cypermethrin is 2.5 ug/vial.
- Results show pretty good tolerance to synthetic pyrethroids.
- Difference between field and sweet corn may indicate that coverage is not the problem.
- Will evaluate methomyl during the next generation of adults.
- Some kind of resistance management strategy is necessary to maintain efficacy of insecticides.

# Corn Earworm Control Problem on Sweet Corn

- Probably need to identify other effective insecticides with different modes of action for rotation to reduce selective pressure.
- For sure, any deposition evaluations using the spray table to determine insecticidal efficacy on corn silks will require use of field-collected insects to be realistic.
- Planning spray table research on effect of deposition pattern on corn silks relative to insecticide efficacy.

# Pests to be Evaluated in Spray Table Research

- **Need to use field-collected insect pests.**
- **Makes evaluations considerably more complicated.**
- We have made significant progress in this area with the different pests: thrips, cotton aphids, cotton fleahoppers, stink bugs, corn earworms/bollworms and tobacco budworms.







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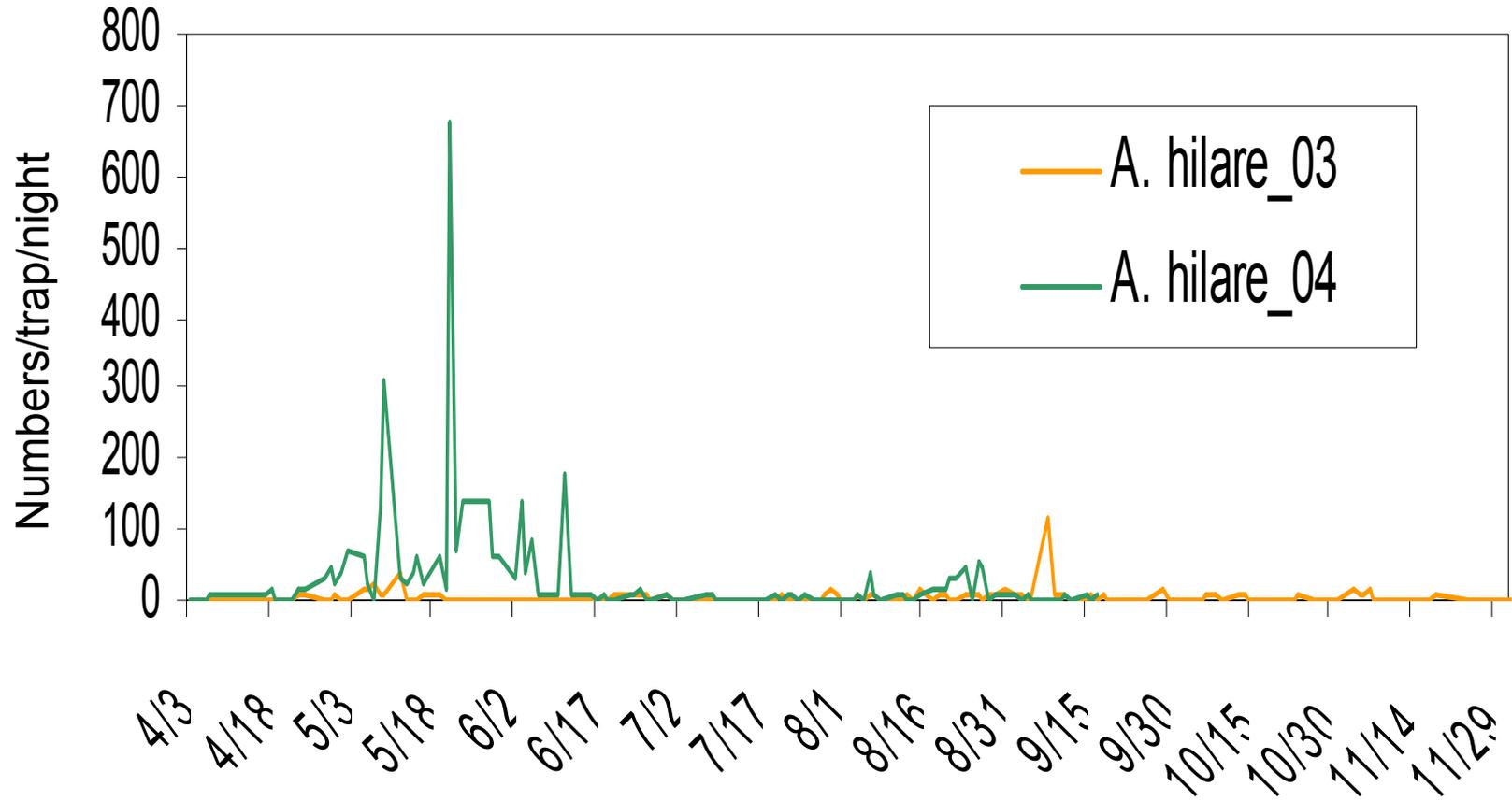


# Captures of Brown Stink Bugs in Blacklight traps

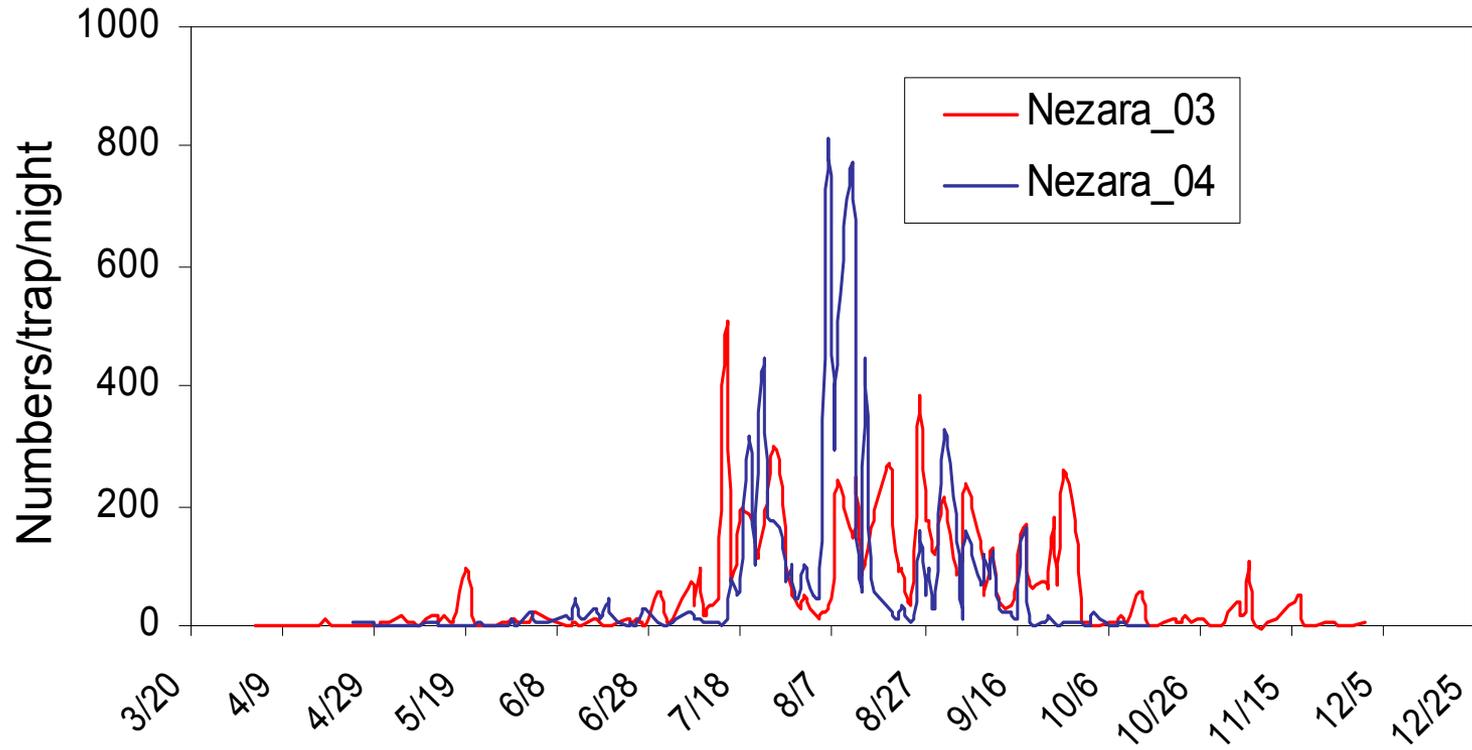
Numbers/trap/night



# Captures of Green Stink Bugs in Blacklight traps



# Captures of Southern Green Stink Bugs in Blacklight traps









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61-200a LT TRAP 2

# Pesticides to be Evaluated

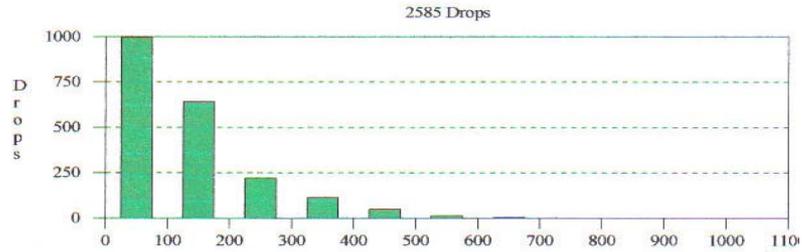
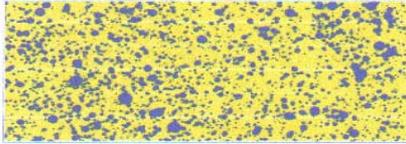
- All recommended and/or labeled insecticides for different pests.
- New insecticides.
- Any additives.



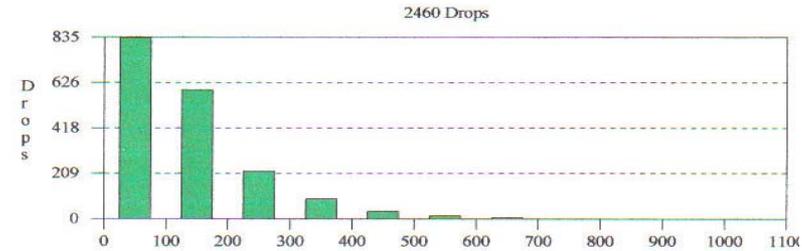
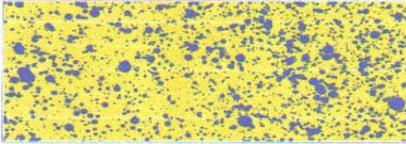




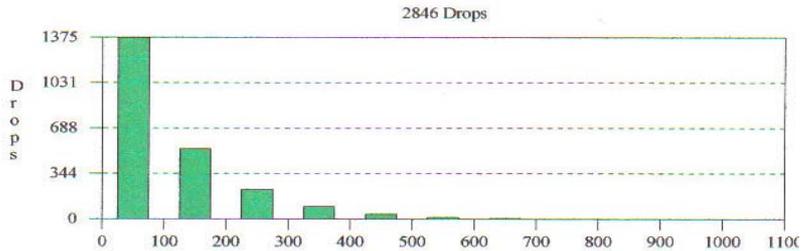
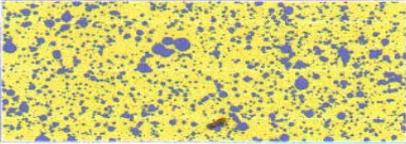
4.0 with 20.20 % area & VMD = 367



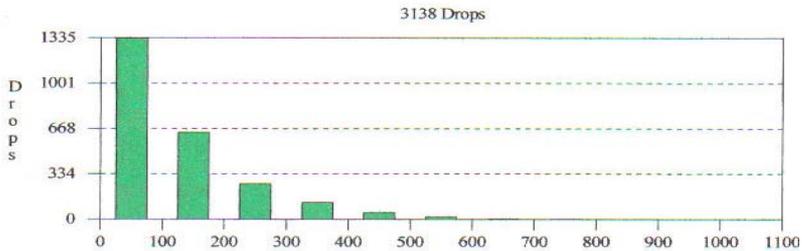
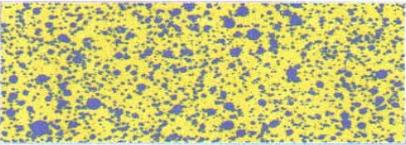
5.0 with 18.16 % area & VMD = 360



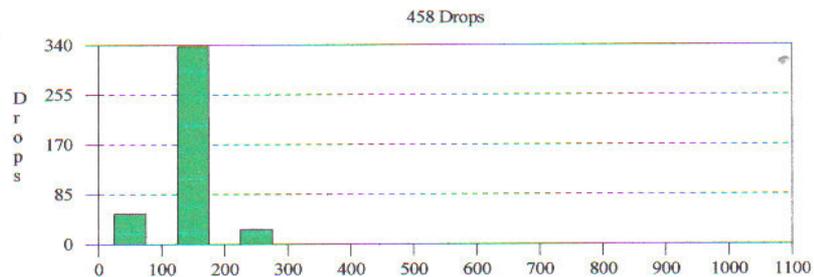
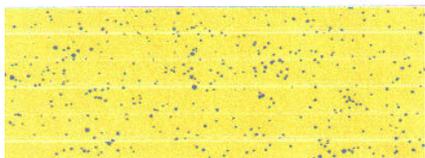
6.0 with 18.11 % area & VMD = 365



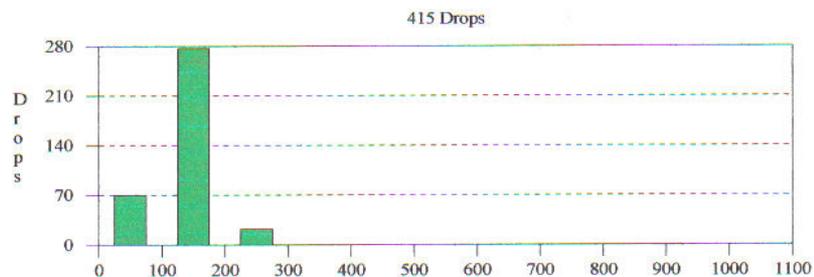
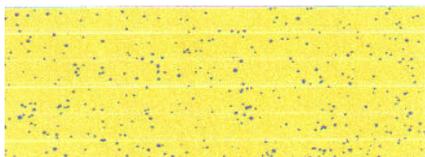
7.0 with 22.70 % area & VMD = 366



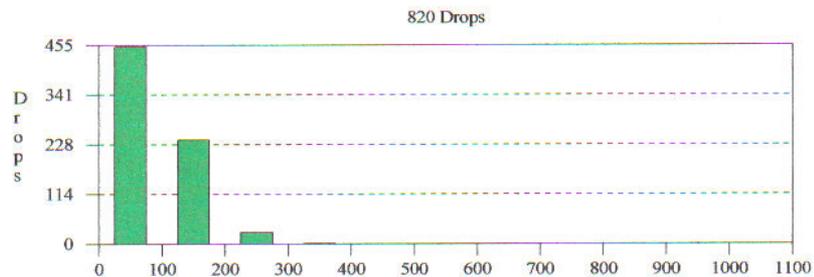
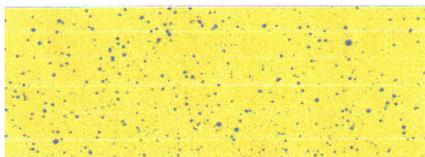
4.0 with 1.98 % area & VMD = 161



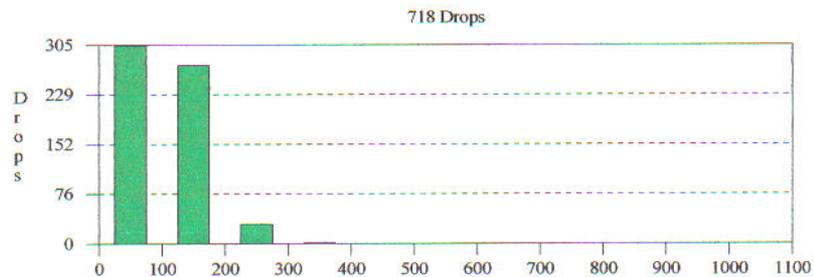
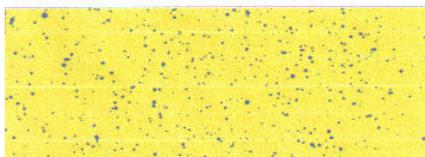
5.0 with 1.63 % area & VMD = 160



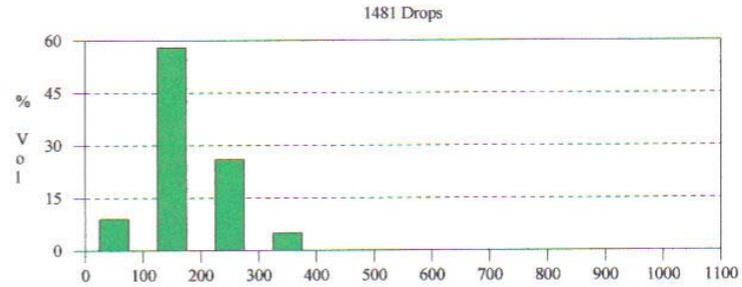
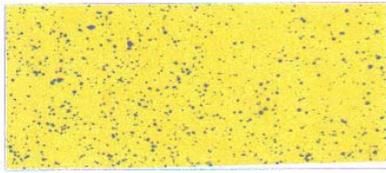
6.0 with 1.96 % area & VMD = 173



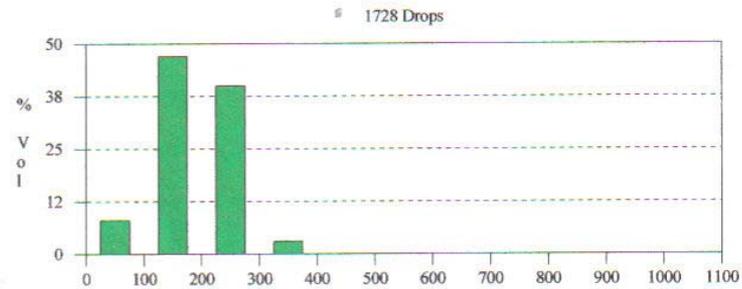
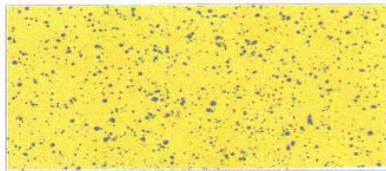
7.0 with 1.99 % area & VMD = 168



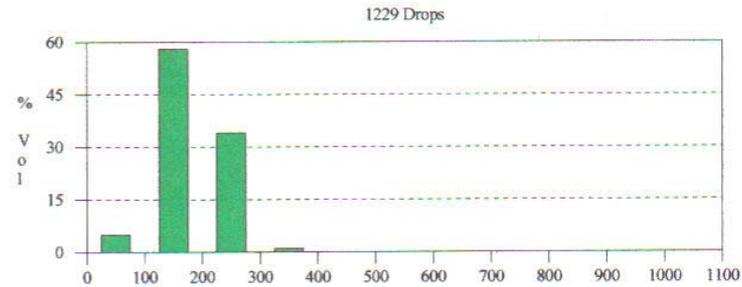
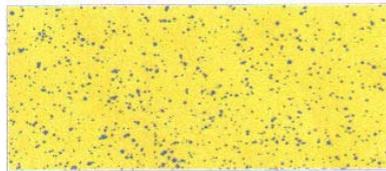
0.0 with 0.976 GPA & VMD = 170



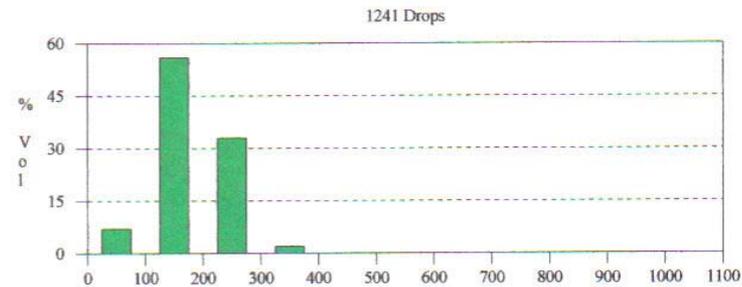
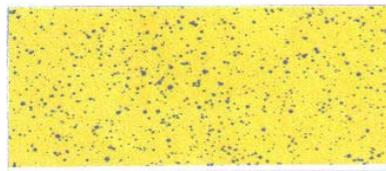
1.0 with 1.266 GPA & VMD = 188



2.0 with 1.155 GPA & VMD = 179



3.0 with 1.151 GPA & VMD = 177





# Final Two Components

- Set-up aircraft spray system to get optimum spray deposition indicated by spray table.
- Verify insecticidal efficacy under field production conditions with pests present.