Generating Solid Data: Clear, Concise, Complete

a thrilling data saga brimming with moral lessons, dire warnings and epic tales of remarkable data masters…

Stephen Flanagan: Assistant Regional Field Coordinator

w/ UC Davis, California

Leona Horst: Field Research Director

w/ USDA-ARS Wooster, Ohio

The IR-4 Project









Generating Solid Data

- Intro/Why?
- Completion Guidelines
- Challenging Studies
- Watch Outs & Discussion

Generating Solid Data: Introduction & Why?

- **Is your data ready for downstream?**
  - **Clear (Is your story well told?)**
  - **Concise (sufficient information, not a tome)**
  - **Complete (all protocol required elements, phyto?, PHIs, samples, etc)**
  - **Hopefully before it leaves FRD (and on a timely basis)**

- **Field Phase is 1st Step of a lengthy "downstream" data run…**
  - **-> QC review**
  - **-> eQA review**
  - **-> Petition prep**
  - **-> EPA Review**

What Category is your data?

I: Stellar

- **Breezes through QC (Complete), eQA (no GLP issues)**
- **Samples are all there & correct**
- **Analysis makes sense (clean controls & RACs in line)**

II: Rock Solid

- **A few minor QC/eQA findings**
- **Review process is straightforward and timely**
- **Same end result as Stellar**

III: Rocky

- **Significant # of QC/eQA findings**
- **Review process is costly & challenging**
- **Key Problem = Does the story match what happened?**

IV: Uh Oh's:

- **Usually cancelled**
- **Cancelled is sometimes out of your hands**
- **Really not where we want to be…. ☹**

Completion Guidelines

- Custom Forms (simplify calcs)
- Finish notes in field
- Check TS before going to field: Correct Chemical? Correct Formulation?
- Avoid copy & pasting (too easy to repeat errors)
- Notebook finishing checklist
  - Sample receipt by lab?
  - Adjuvant label?
  - Legible Temp graphs?
  - Correspondence?

Observe High Quality Work:
We brought (and posted) excellent examples

Example Field Data Notebooks

Complete, Correct & Concise

Data that's ready for the downstream...

Drip Injection.Mazzei n Airblast Oxithiopiprolin Avocado Ennes

Drip Injection.Tank V10208 Pepper Craig

Foliar Directed.Backpack Bifenzate Banana Coughlin

Greenhouse Cyclaniliprole Tomato Ennes

Post Harvest-Potassium Phosphite Citrus Ennes

Foliar Broadcast Quinclorac Cranberry Heider

http://wrir4.ucdavis.edu/nec.2020/solid.fdns.html

- Challenging Studies:

When the book doesn't match

- Injection Studies (Mazzei versus bulk tanks)

- Transplant drenches

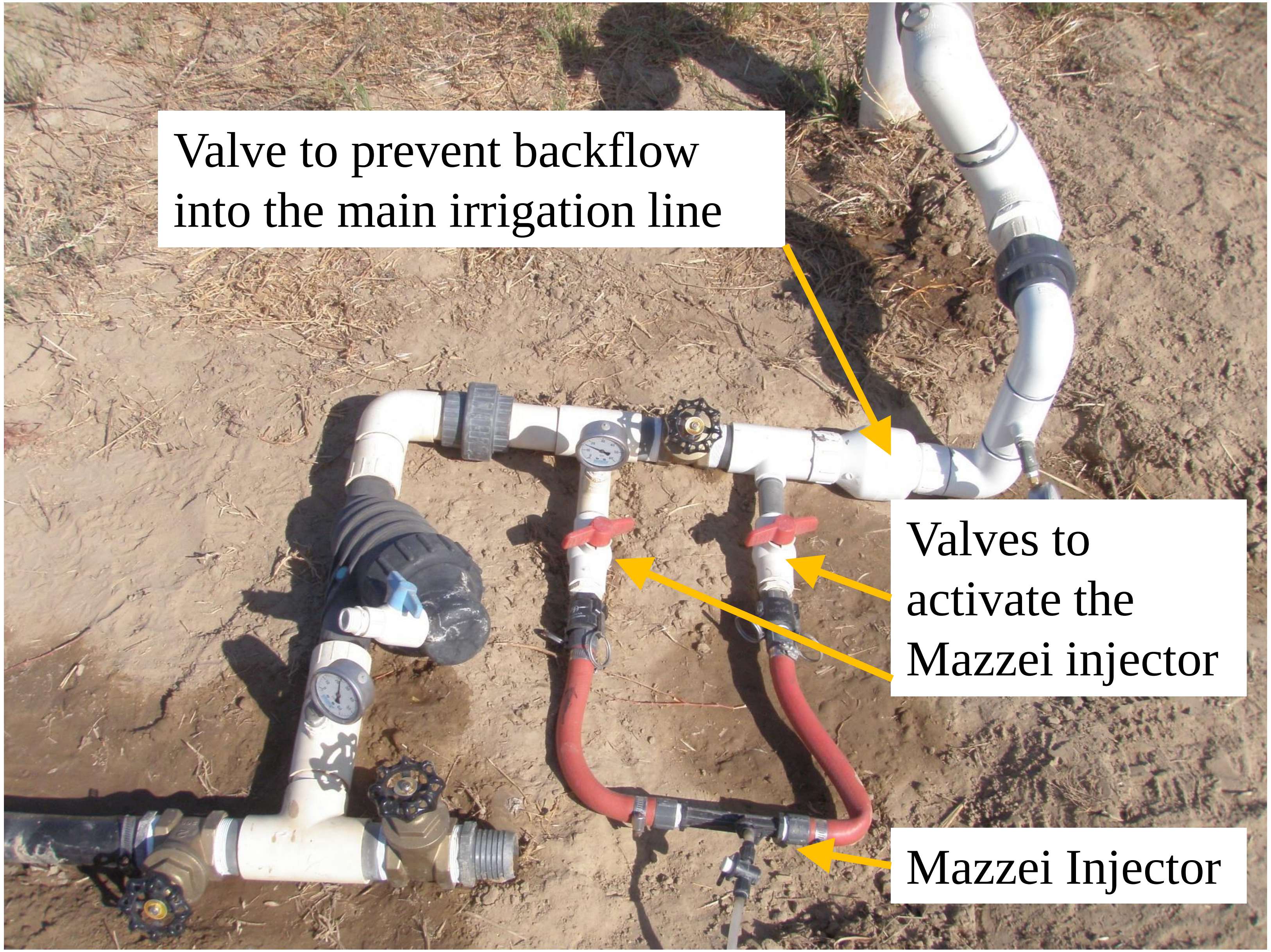
- Seed Treatments

- Greenhouses

- Post Harvest

Injection Studies

12650.19-CA433 Fluopyram+Trifloxystrobin Kiwifruit Application 1 10-1-19



Mazzei injector unit attached to irrigation system

12650.19-CA433 Fluopyram+Trifloxystrobin Kiwifruit Application 1 10-1-19

Test substance in solution with draw hose from Mazzei injector

Pipette in bucket used to stir the solution occasionally as the test solution is being injected into the irrigation water.

12650.19-CA433 Fluopyram+Trifloxystrobin Kiwifruit Application 1 10-1-19

Four line drip system in TRT 02 test plot

There were 4 lines used since the output of two lines was not sufficient to activate the mazzei injector when the trial was first started. The trial was restarted using 4 irrigation lines.

Drench Applications

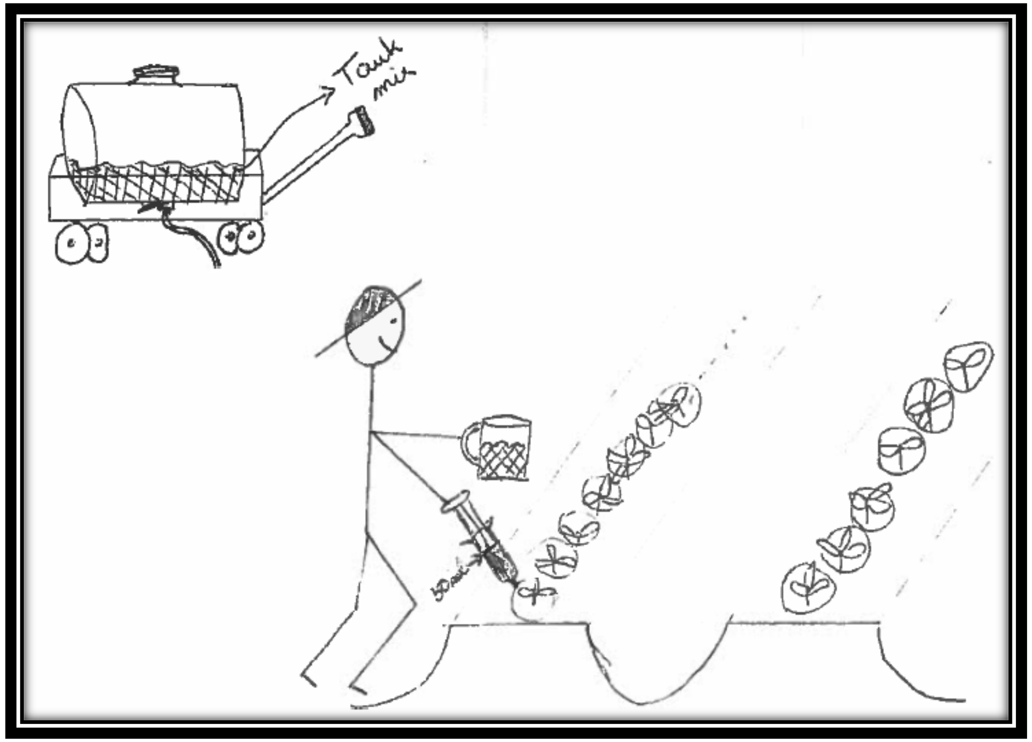
Cristina Marconi

Transplant Drench Application

- **Protocol**: Apply 100 ml of the fungicide/water solution (50 ml product/100 L water) to the base of each transplant, after crop has been transplanted into the soil.
- How to deliver TS?
- How to calculate amount of solution needed?
- Actual amount of TS applied?

How to deliver TS

- 60 ml Syringe with 1 ml increments
- Find a big enough container for total solution needed or divide in smaller containers (record accordingly into part 6G).
- Avoid run-off during app



How to calculate amount of solution needed?

Treated area for drench app:

3.33 ft (width) x 2 beds x 60 ft (Length) = 399.6 ft^2

plants/plot = (60 ft + 1 plant) x 1 foot x 2 rows/bed x 2 beds = 244 plants/p

244 plants x 100 ml/plant = 24,400 ml (24.4 L)

Amount TS = $\frac{50\text{ ml TS} \times 24.4\text{ L}}{100\text{ L}}$ = 12.2 ml TS in 24.4 L w

How to calculate actual amount of TS applied?

Note: *Use bed width for plots with multi-row beds.*

Amount left of the tank mix = 400 ml

$$\text{Amount applied} = 24{,}400\ \text{ml} - 400\ \text{ml} = \boxed{24{,}000\ \text{ml}}$$

$$\text{Deviation} = 100 - \left(\frac{\overset{\text{Applied}}{24{,}000\ \text{ml}}}{\underset{\text{calculated}}{24{,}400\ \text{ml}}} \times 100\right) = -2\%$$

$$\text{Amount TS applied} = \frac{\overset{\text{Applied}}{24{,}000\ \text{ml}} \times 12.2\ \text{ml TS}}{\underset{\text{calculated}}{24{,}400\ \text{ml}}} = \boxed{12\ \text{ml TS}}$$

$$\text{Deviation} = 100 - \frac{12\ \text{ml TS applied}}{12.2\ \text{ml calculated}} \times^{*} \times 100) = -2\%$$

WAS ACTUAL APPLICATION RATE WITHIN -5% TO +10% OF PROTOCOL RATE?

Trick from the pros: finished FDB checklist

Pepper
11790.19-TX367

✓ GLP letter
✓ SOP List
✓ C.V.'s CM / AR
✓ Training records CM / AR
✓ TS Use Log (Date range 11.5.19 to 11.11.19)
✓ Label for any adjuvant used. Adjuvant name: R-11
✓ TS Storage Temp Log-datalogger (Date range 2.18.19 to 11.11.19)
NA ~~Balance calibration check~~ Log (Date range ~~to~~)
NA ~~Weight calibration~~ log
✓ Station directions map
✓ Station test plot location map
✓ Station plot plan
✓ GPS coordinates
✓ GPS calibration check
✓ Soil Test Info. (routine, textural analysis, OM%)
✓ Site History (min 1 yr)
NA ~~Maintenance log for~~ Manual seeder after planting info.
✓ Cultural practices for Current Season
✓ Pesticides and fertilizer for Current Season
✓ Boom Maintenance Log (Date range 11.5.19 to 11.11.19)
✓ Equipment Maintenance Log (water therm., weather meter, soil therm.)
✓ Freezer #1 Log-Dataloggers (Date range 11.14.19 to 11.20.19)
✓ Freezer #2 Log-Dataloogers (Date range to)
✓ Freezer Contents Log (Date range 11.14.19 to 11.20.19)
✓ Freezer Maintenance/Repair Log (Date range Nov. ~~to~~)
✓ Rainfall Records for trial (Date range 5.22.19 to 11.14.19)
✓ Irrigation Records for trial (Date range 5.22.19 to 11.14.19)

Finished: 1.30.20
Shipped: 2.3.20
pgs: 153

********Canada books REQUIRE 10-yr weather data*******

******Make sure all pages of FDB correspond to the right YEAR******

******Make copy of FDB******

SEND IN BLUE CARD!!!!!

Trick from the Pros: measuring device checklist

Description of Equipment Used to Measure Test Substances, Adjuvant and Carrier

Application No. 2 TRT #2

The syringes used to measure test substances, adjuvants and/or to remove water are 1, 3, 5, 10 and 60 mls. The 1 ml syringe measures in 0.01 ml increments, 3 ml syringe measures in 0.1 ml increments, 5 ml and 10 ml syringes measure in 0.2 ml increments, and the 60 ml syringe measures in 1 ml increments. The following syringes were used in this study:

Test Substance	**Adjuvant**	**Removed Water**
____ 1 ml	✓ 1 ml	____ 1 ml
____ 3 ml	____ 3 ml	____ 3 ml
____ 5 ml	____ 5 ml	____ 5 ml
____ 10 ml	____ 10 ml	____ 10 ml
____ 60 ml	____ 60 ml	____ 60 ml

The graduated cylinders used to measure test substance, adjuvant, carrier and remove water when applicable are 25 ml with 0.2 ml increments, 100ml with 1 ml increments, 250 ml with 2 ml increments, 500 ml with 5 ml increments, 1000 ml with 10 ml increments, 2000 ml with 20 ml increments and 4000 ml with 50 ml increments. The following graduated cylinders were used in this study:

Test Substance	**Adjuvant**	**Carrier Water**	**Removed Water**
____ 25 ml	____ 25 ml	____ 25 ml	____ 25 ml
____ 100 ml	____ 100 ml	____ 100 ml	____ 100 ml
____ 250 ml	____ 250 ml	____ 250 ml	____ 250 ml
____ 500 ml	____ 500 ml	✓ 500 ml	____ 500 ml
____ 1000 ml	____ 1000 ml	____ 1000 ml	____ 1000 ml
____ 2000 ml	____ 2000 ml	____ 2000 ml	____ 2000 ml
____ 4000 ml	____ 4000 ml	____ 4000 ml	____ 4000 ml

Equipment used to measure dry formulation: Scale Sartorius BP3100 S ✓

Above data entered by: CM Date: 9.25.19

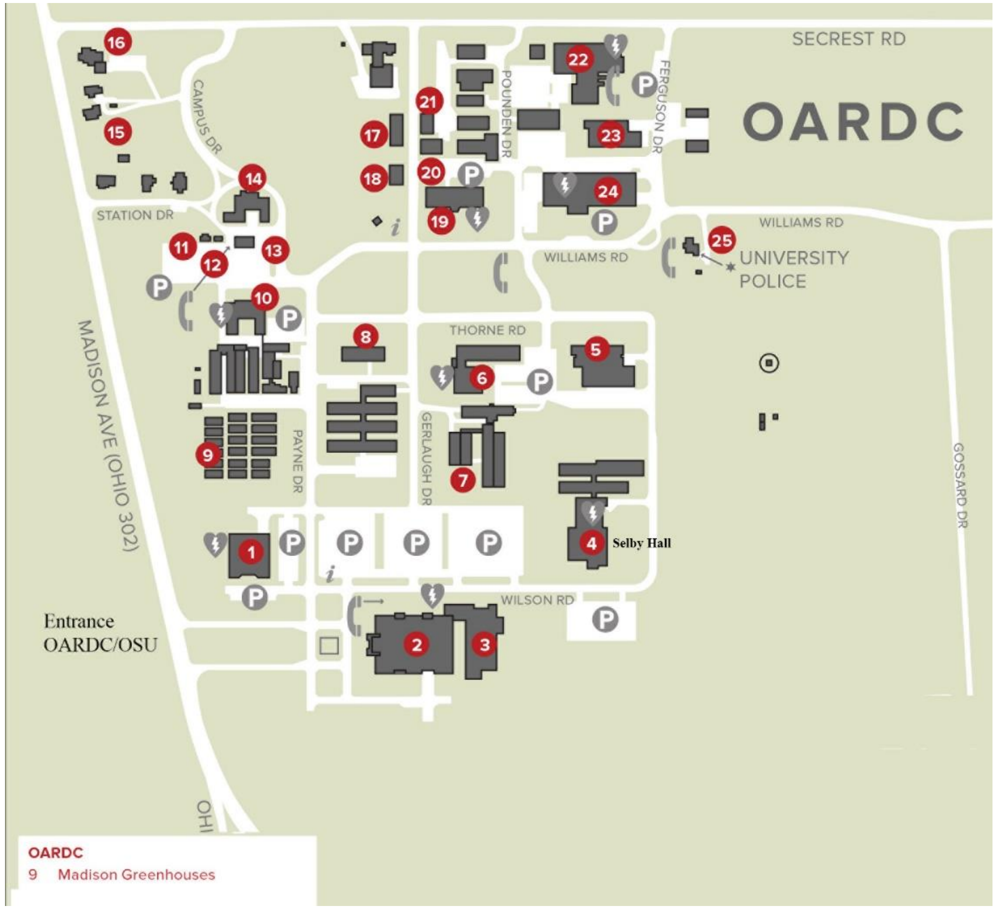
COMPLETE IF APPROPRIATE: ATHIS IS A TRUE, EXACT COPY OF THE ORIGINAL.

THE ORIGINAL IS IN ____________ INITIALS ______ DATE ________

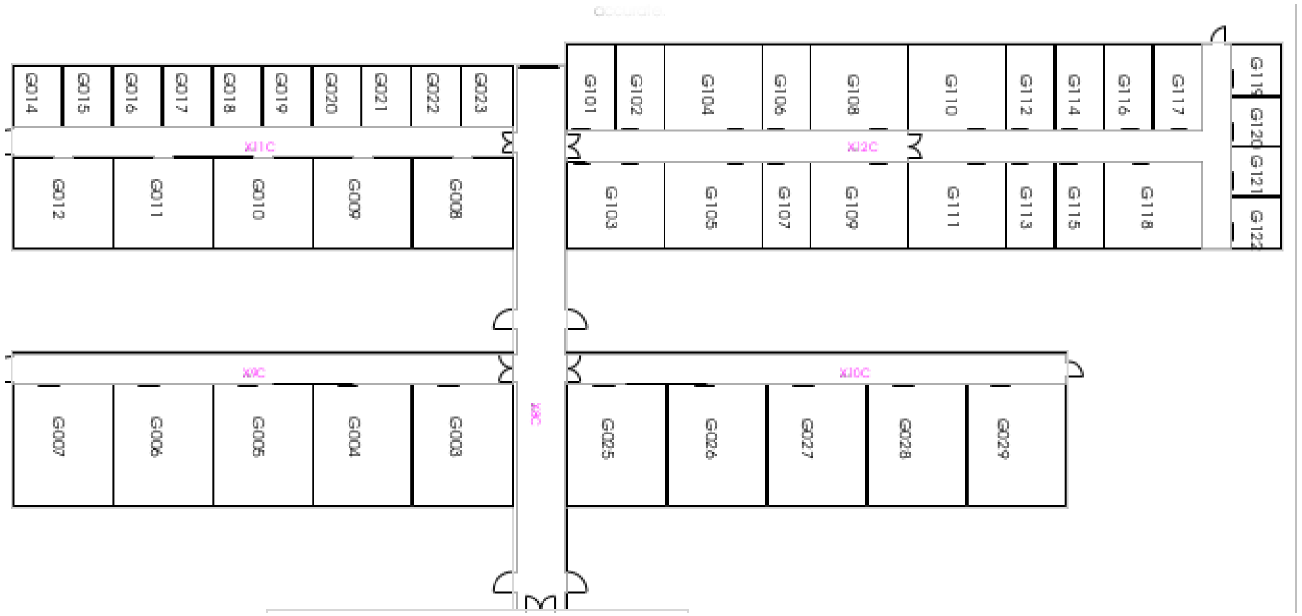
Greenhouse Trials

Rm 018 TRT02
cucumber

Trial Site Information



- How do I give good directions to the greenhouse test plot site?



Trial Site Information

- How do I document the soil information?
- How do I set up the plants to best facilitate the type of application required by the protocol?
- If the greenhouse has been used for other experiments, how do I document the test site history?

Trial Site Information - Hydroponics

- What do I do on Part 5F when there is no soil?
- How do I set up the plants to best facilitate the type of application required by the protocol?

Seed Treatment Trials
Leona Horst

Seed Treatment Trials – chain of custody

Seed TRT Trial Information

- How do I calculate the amount of seed to send for treatment?
- Where does this get recorded?

Seed TRT Trial Information

- What information is needed on the seed packet label?
- Where does this information go in the FDB?
- What if an expiration date is missing on the packet when the treated seed is returned?

Trial Site Information

- Ideas on how to document storage conditions/temperature data for the unused seed.

Post harvest Application on pack line

David Ennes

Post Harvest Grapefruit Control Droplet Applicator Application On PVC Roller Pack-Line

Mixing the test substance in water at 50 C. The metal pot is on a heated stir pad.

The pass time is being done for the treated fruit passing under the CDA.

Post Harvest Grapefruit Control Droplet Applicator Application On PVC Roller Pack-Line

Fruit running under CDA on PVC rollers

Multiple treatments laid out to dry after application

Post Harvest Grapefruit Drench Application On PVC Roller Pack-Line

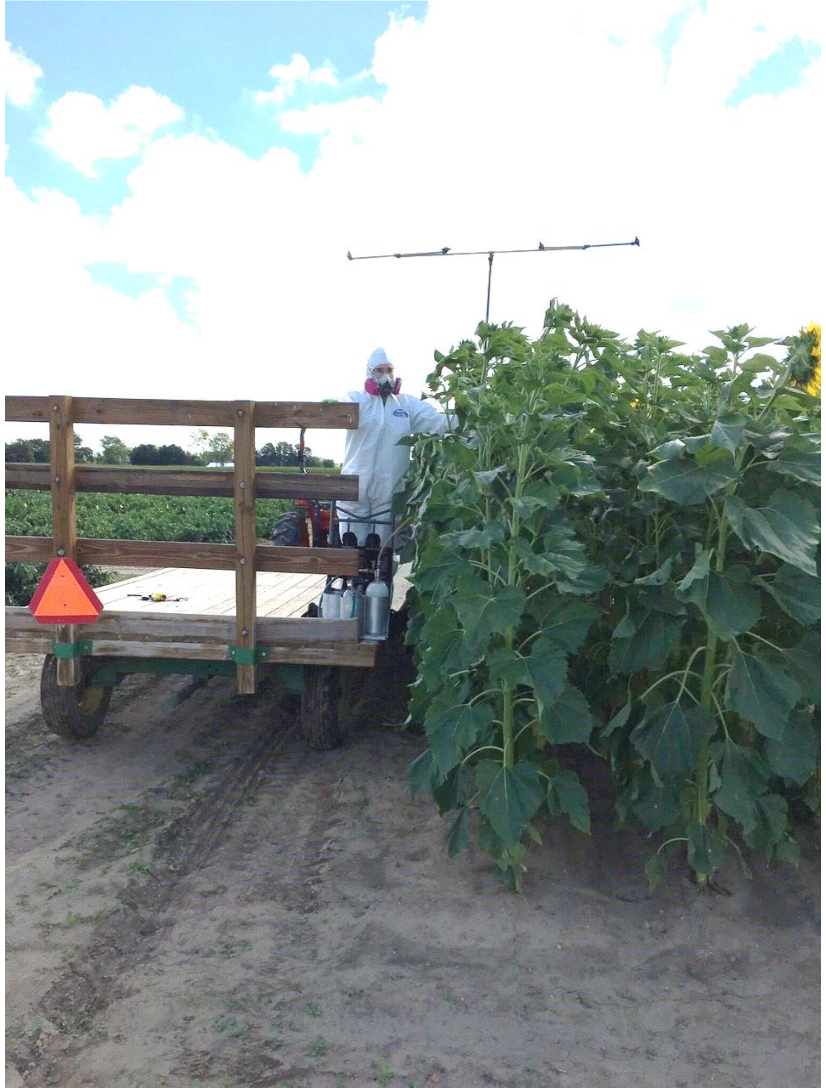
Fruit being feed onto rollers going under drench applicator

Fruit going under drench applicator

UH – OH moments

Uh oh moments:

(When the plants become like Jack's beanstalks in the fairy tale….)



- What do you do when the plants are too tall for your sprayer system?
- Seed description stated plant height would be 5-6 ft tall. By application time, they were actually 14-16 ft tall.

Uh oh moments:

(When the applicator gets stuck in the mud….)

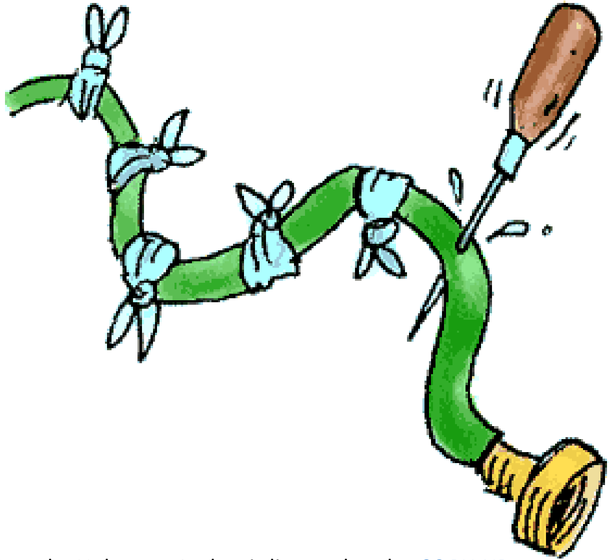
- The weather had been many rainy days. Applications were already started for the trial and the application window was at the maximum interval allowed in the protocol.

- So, an application needed to be applied by hand instead of with a tractor & sprayer.

- In the middle of a foliar broadcast application in a very wet muddy field the applicator's boots got stuck in the mud. What should the applicator do?

Uh oh moments:
(When the hose flies off the handle)

- After doing an application, a hose splits that goes to 1/3 of the boom during a calibration recheck.
- No extra hoses the correct size are in the truck to replace the broken hose.
- Solution?



Uh oh moments:

(When the weather channel is incorrect)

- Calibration is complete and the tank mix made and ready to apply.
- Suddenly the day that was forecast as no rain changes to a downpour.
- Downpour yields a flooded field site.

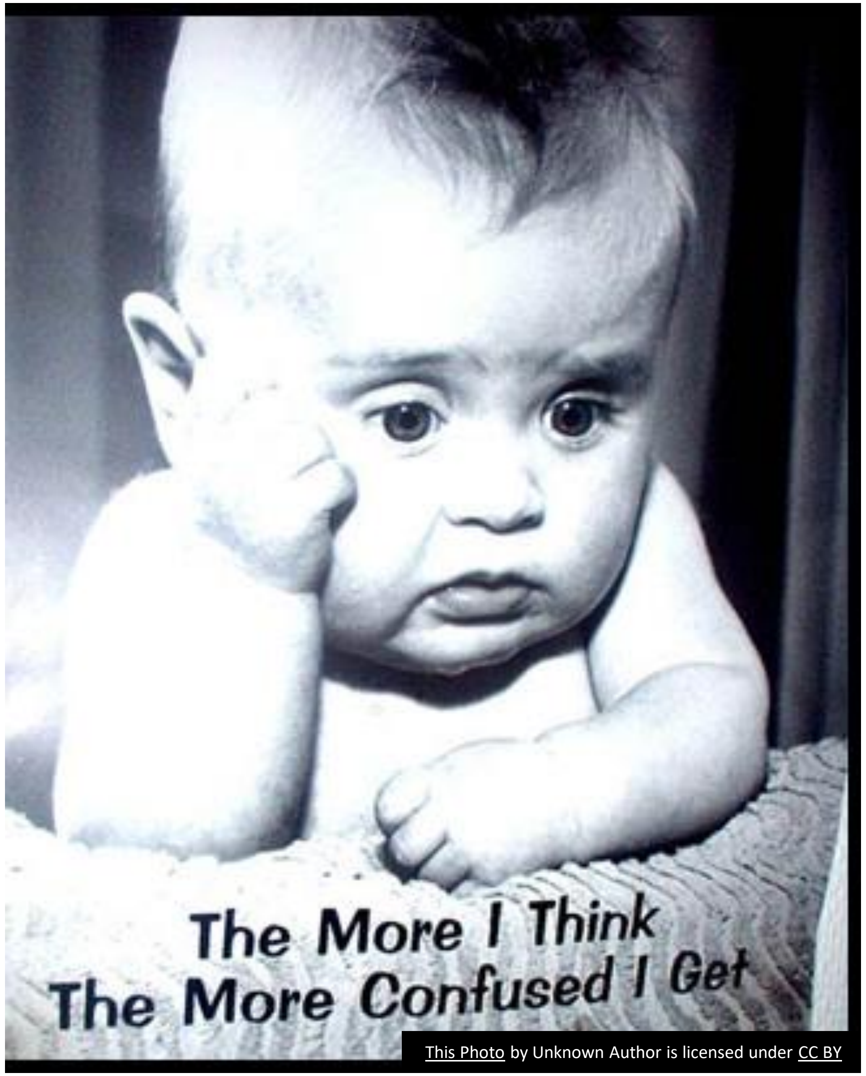
Uh oh moments:

(When that pesky fly buzzing around your face causes ....)

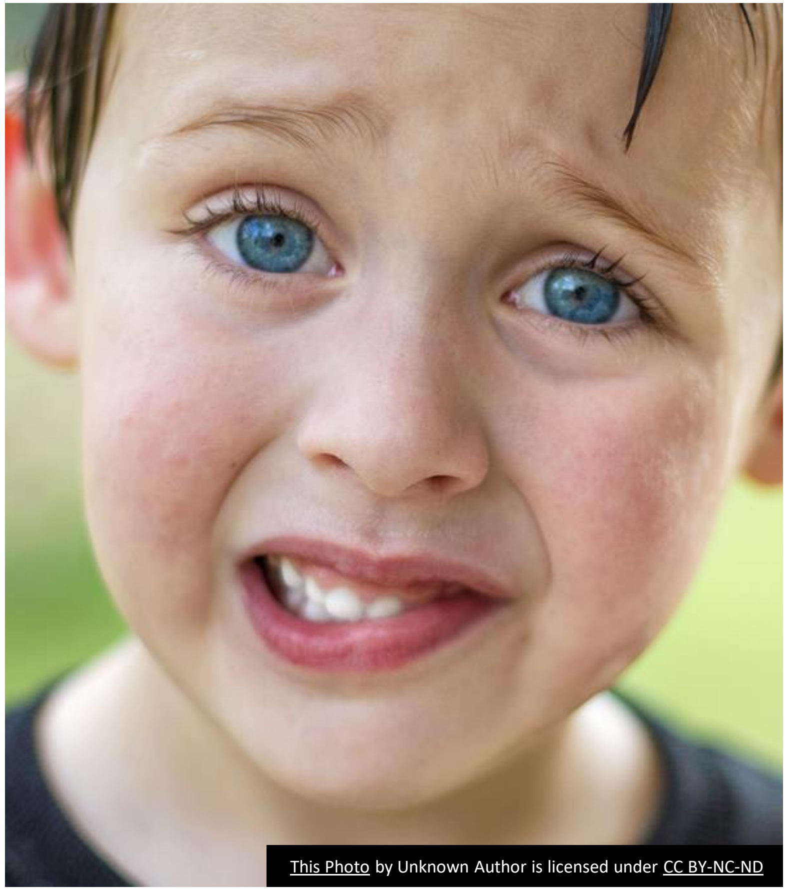
- When measuring the pesticide to add to the water in the sprayer tank, your hand slips and part of the chemical spills on the ground.
- The remainder is still in the graduated cylinder.
- How do you record this error on the test substance usage page?
- What is the safe way to clean-up the spilled chemical?

Uh oh moments: (When the full CO2 tank ……..)

is discovered to be empty after traveling several hours to a field site.



Traveled to a distant field site and discover the graduated cylinders are missing!



You get to the field site and UH-OH……….

UH-OH moment: Phyto or Disease?

What are some of your UH-OHs