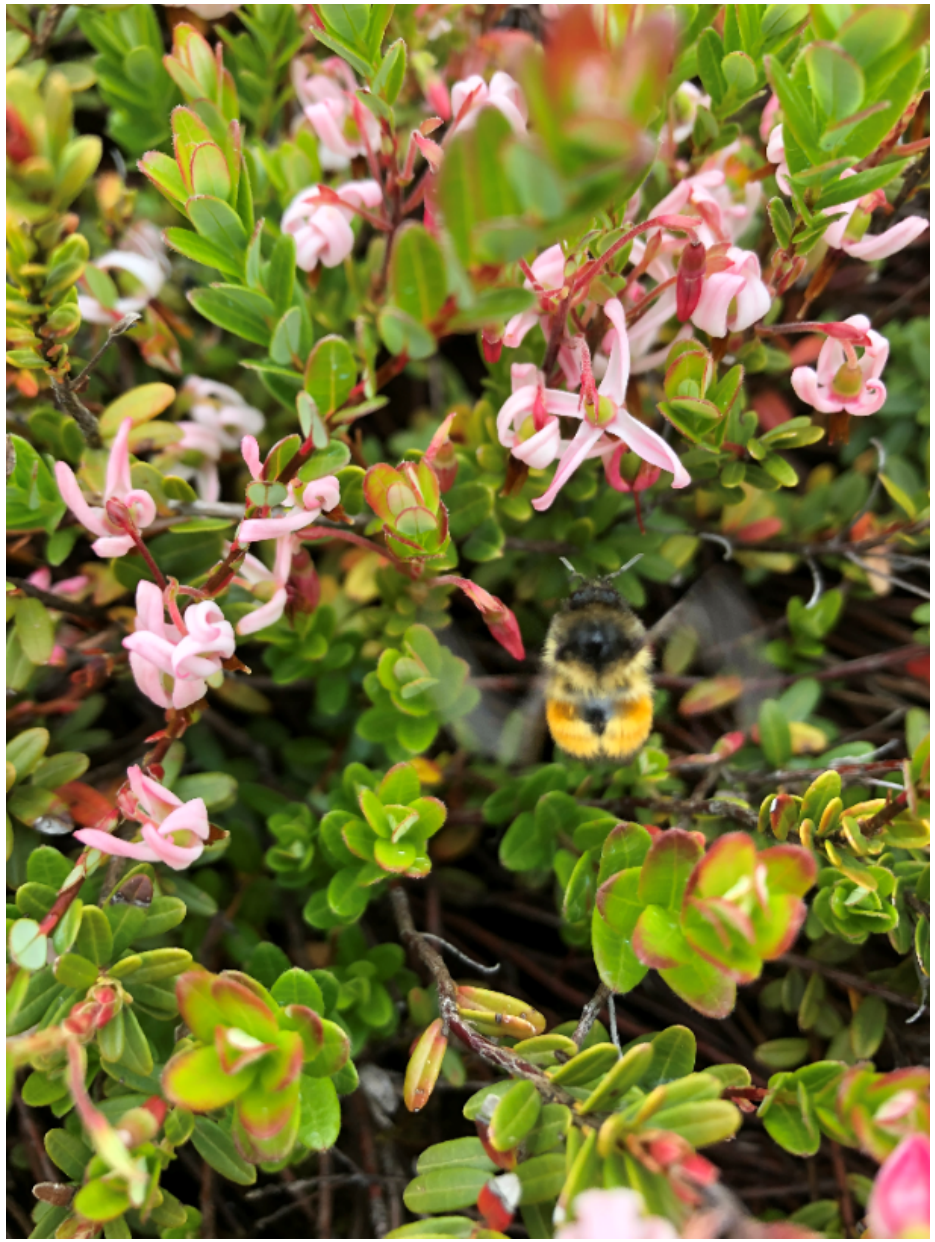


Washington Research Update

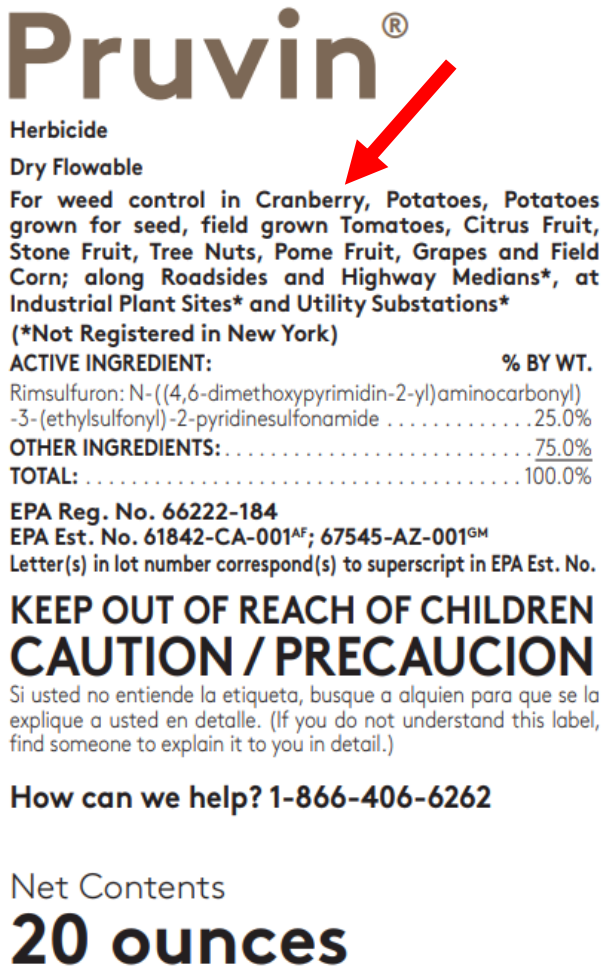
aka I survived my first year

Sam Tochen, WA Ag. Scientist
Ocean Spray Cranberries

2020 Washington Cranberry School

Quick product updates

- Pruvin (next prod. cycle: now-March)
  - Check w/handler for export fruit
  - Labeled weed activity:
    - Grasses/sedges: Numerous grass species including baryardgrass, quackgrass, annual bluegrass, yellow nutsedge
    - Broadleaves: Thistle, smartweed, dandelion, ragweed
  - Observed weed activity (c.o. K. Patten):
    - Numerous grasses, rushes and sedges: Efficacy varying by species, timing and rate
    - Broadleaves: Suppression to control of young silver leaf, small lotus, and small yellow weed, all size buttercup


Pruvin®

Herbicide

Dry Flowable

For weed control in Cranberry, Potatoes, Potatoes grown for seed, field grown Tomatoes, Citrus Fruit, Stone Fruit, Tree Nuts, Pome Fruit, Grapes and Field Corn; along Roadsides and Highway Medians*, at Industrial Plant Sites* and Utility Substations*

(*Not Registered in New York)

ACTIVE INGREDIENT: % BY WT.

Rimsulfuron: N-((4,6-dimethoxypyrimidin-2-yl)aminocarbonyl)-3-(ethylsulfonyl)-2-pyridinesulfonamide 25.0%

OTHER INGREDIENTS: 75.0%

TOTAL: 100.0%

EPA Reg. No. 66222-184

EPA Est. No. 61842-CA-001[AF]; 67545-AZ-001[GM]

Letter(s) in lot number correspond(s) to superscript in EPA Est. No.

KEEP OUT OF REACH OF CHILDREN

CAUTION / PRECAUCION

Si usted no entiende la etiqueta, busque a alquien para que se la explique a usted en detalle. (If you do not understand this label, find someone to explain it to you in detail.)

How can we help? 1-866-406-6262

Net Contents

20 ounces

ADAMA ESSENTIALS

Pre and Post-emergent weed activity in cranberry beds (hopefully suggestions)

Arrowgrass –(rush): We have had mixed results. For best control treat right after harvest when still green, and use repeated applications. Experiment. Not convinced of any efficacy after frost damage.

Yellowweed: Suppression ? Yes, but can get damage to vines with spring timing. Experiment.

Sedges (cutgrass): Maybe if young and small. Experiment.

Other rushes (Spike rush): Maybe if young and small. Experiment

Sheepsorrel/sourgrass – no

Lily – no

c/o K. Patten

Rates

- Label rate is 2 oz/ac = 0.12 oz/3 gallon backpack @ 50 gpa
- Label rate is twice that of Curio
- What ever you did with Curio – double for Pruvin

~70 granules in a gallon = 2 oz/ac @ 50 gpa

c/o K. Patten

Rates

- During the dormant season cranberry vines are very tolerant
- Once bud set occurs in the summer cranberry vines are tolerant
- Cranberry are sensitive in the spring during new growth, just like Curio.

c/o K. Patten

Surfantant

- NIS, COC or MSO
- Use a NIS that is safe for cranberries during new growth
- MSO or COC will work better during dormant season.

Mixing

- Same as Curio, pre-dissolve before adding to tank and continue to agitate

c/o K. Patten

- OR SLN label for chemigation of Clethodim product

CLETHODIM	GROUP	1	HERBICIDE

WILBUR-ELLIS.

HERBICIDE
VAQUERO®

ACTIVE INGREDIENT:
Clethodim* 26.4%
OTHER INGREDIENTS: 73.6%
TOTAL: 100.0%

Contains Petroleum Distillates

*(E)-2-[1-[[(3-chloro-2-propenyl)oxy]imino]propyl]-5-[2-(ethylthio)propyl]-3-hydroxy-2-cyclohexen-1-one
VAQUERO® contains 2.0 lb. clethodim per gallon.

EPA Reg. No. 2935-559 EPA Est. No. 42750-MO-001

Ideas to Grow With

FIFRA Section 24(c) Special Local Need Label

FOR DISTRIBUTION AND USE ONLY WITHIN THE STATE OF OREGON

VAQUERO®

EPA Reg. No. 2935-559 EPA SLN No. OR-190014

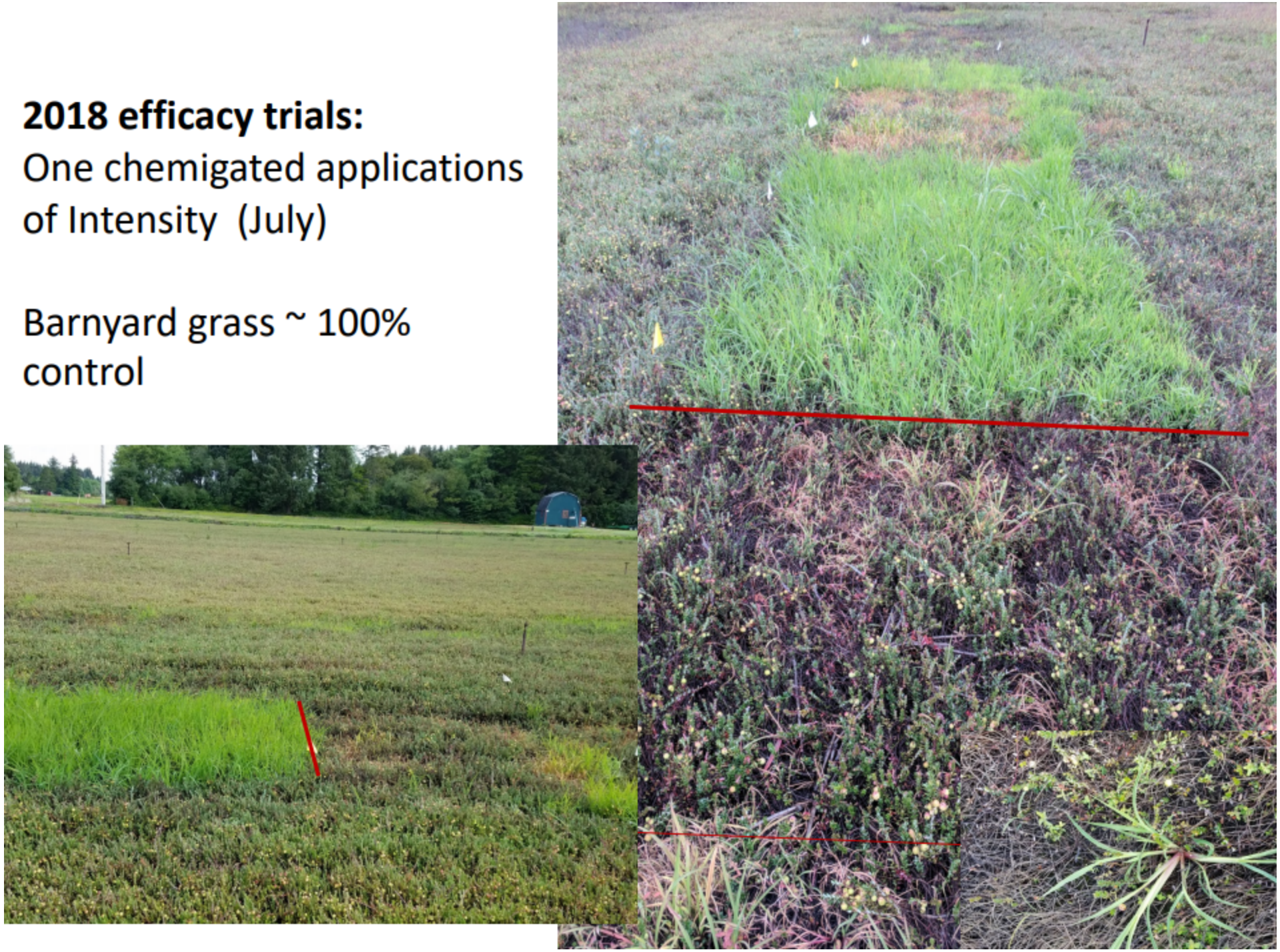
For Application by Chemigation for Control of Grass Weeds in Cranberry

This label is valid until December 31, 2024 or until otherwise amended, withdrawn, canceled, or suspended.

Active Ingredient:

2018 efficacy trials:
One chemigated applications of Intensity (July)

Barnyard grass ~ 100% control



c/o K. Patten

2018 efficacy trials:

Grasses with excellent control

Sweet Vernal ~ 90 to 100 %
Barnyard grass ~ 100%
Velvet grass ~ 80 to 100%

Grasses with moderate control

Fescues ~ 10 to 40%
Reed Canary grass ~ 50 - 75%
Creeping Bent grass ~ 40 to 80%
Salt Grass ~ 10 to 40%

Grasses with no control

Fine Fescues

Cost per application:

~ 5-7$/ac Rate: 6-8 oz
May require >1 application

Timing:

Young actively growing
Early post-emergence

Two options – no differences

Intensity
Intensity One

Effect on Crop:

None noted
30 day PHI

c/o K. Patten

Quick product updates cont.

- Fanfare
  - September 2020 (tentative)
- Still no Chateau ☹

GROUP 14 HERBICIDE

NET WEIGHT 2-1/2 POUNDS

Active Ingredient	By Wt
Flumioxazin*	51.0%
Other Ingredients	49.0%
Total	100.0%

*2-[7-fluoro-3,4-dihydro-3-oxo-4-(2-propynyl)-2*H*-1,4-benzoxazin-6-yl]-4,5,6,7-tetrahydro-1*H*-isoindole-1,3(2*H*)-dione

Chateau® Herbicide SW is a water dispersible granule containing 51% active ingredient.

EPA Reg. No. 59639-99
EPA Est. 11773-IA-1Ⓦ, 39578-TX-1Ⓔ
Superscript is first letter of lot number.

KEEP OUT OF REACH OF CHILDREN
CAUTION
SEE NEXT PAGE FOR ADDITIONAL PRECAUTIONARY STATEMENTS

FOR CONTROL AND/OR SUPPRESSION OF CERTAIN WEEDS IN ALFALFA, ARTICHOKE, ASPARAGUS, BUSHBERRIES, CELERY, COTTON, FIELD CORN, GARLIC, GRAPE, HOPS, MINT, NUT TREES (INCLUDING PISTACHIO), OLIVE, ONION (DRY BULB), POME FRUIT, POMEGRANATE, STONE FRUIT, STRAWBERRY, SWEET POTATO, NON-BEARING FRUIT TREES, FALLOW LAND AND TO MAINTAIN BARE GROUND ON NON-CROP AREAS OF FARMS, ORCHARDS AND VINEYARDS.

VALENT®

CHATEAU®
HERBICIDE SW

RESTRICTED USE PESTICIDE
Toxic to fish and aquatic organisms
For retail sale to and use only by certified applicators or persons under their direct supervision and only for the uses covered by the certified applicator's certification.

Fanfare® ES

GROUP 3 INSECTICIDE

INSECTICIDE/MITICIDE

ACTIVE INGREDIENT:	% BY WT.
Bifenthrin: (2 methyl[1,1'-biphenyl]-3-yl)methyl 3-(2-chloro-3,3,3-trifluoro-1-propenyl)-2,2-dimethyl-cyclopropanecarboxylate*	22.6%
OTHER INGREDIENTS:	77.4%
TOTAL:	100.0%

*Cis isomers 97% minimum, trans isomers 3% maximum.

Fanfare ES is a suspension concentrate insecticide containing 2 pounds of bifenthrin per gallon

EPA Reg. No. 66222-236
EPA Est. No. 37429-GA-001BT; 37429-GA-002BO
Letter(s) in lot number correspond(s) to superscript in EPA Est. No.

KEEP OUT OF REACH OF CHILDREN
WARNING-AVISO

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle. (If you do not understand the label, find someone to explain it to you in detail).

For First Aid, Precautionary Statements, and Directions for Use, see inside of this booklet.

How can we help? 1-866-406-6262

INSECTICIDE/ MITICIDE

ADAMA ESSENTIALS

NOT LABELLED

Topics

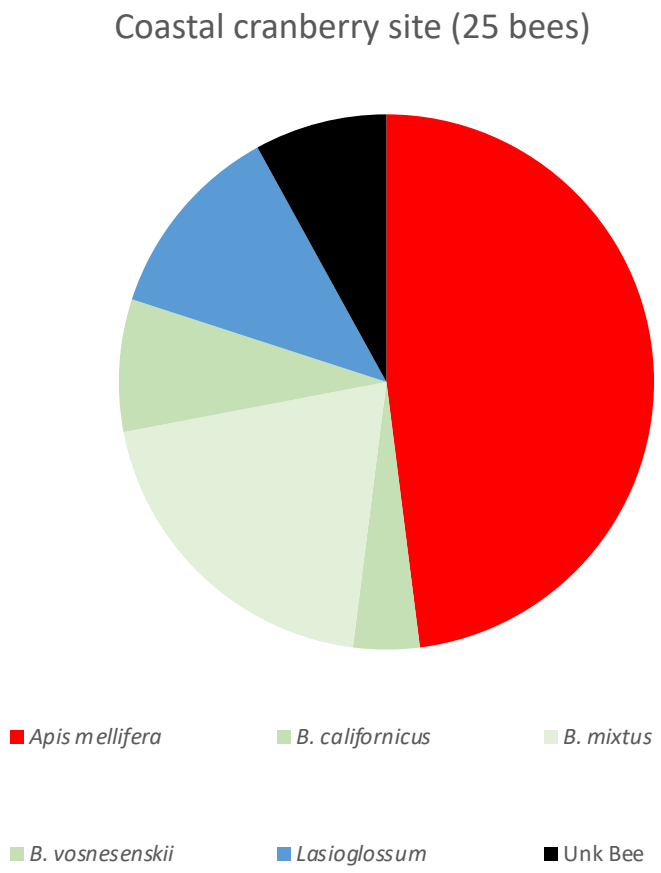
- Quick bee stuff
- Bug vacuum
- WA Fungicide trial

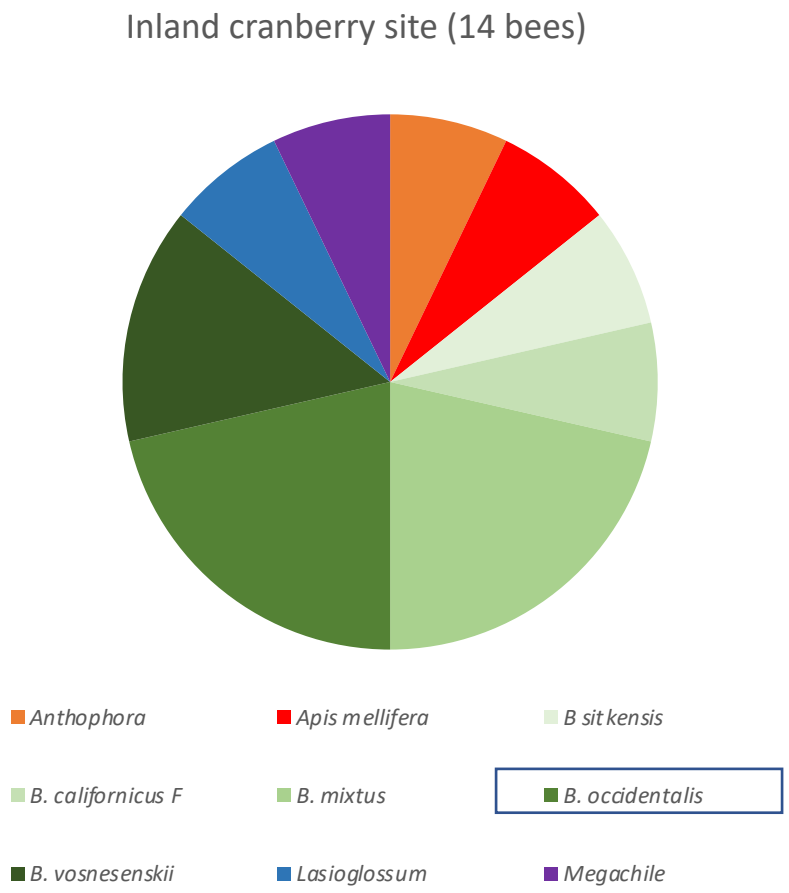
Bee bycatch in different moth trap technologies

Chris Looney[1], Lori Spears[2], and Todd Gilligan[3]

[1]Washington State Department of Agriculture, [2]Utah State University, [3]USDA APHIS

Bee capture at two cranberry sites





Who was found (June-Sept)

Bumble bees

Sweat bees

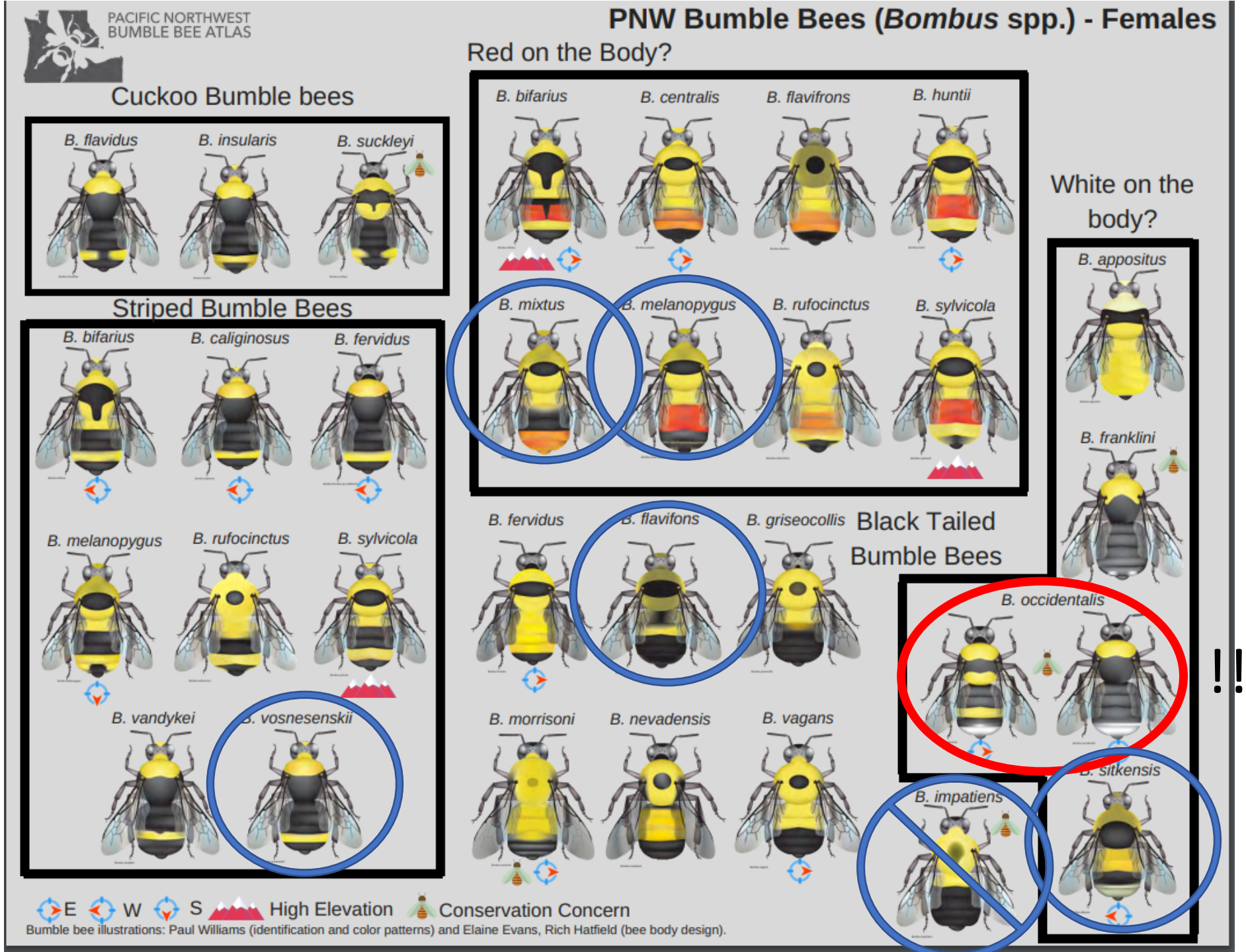
Honey bees

Leafcutter bees

Digger bees

Bombus
caught in
traps

B. californicus



!!!!

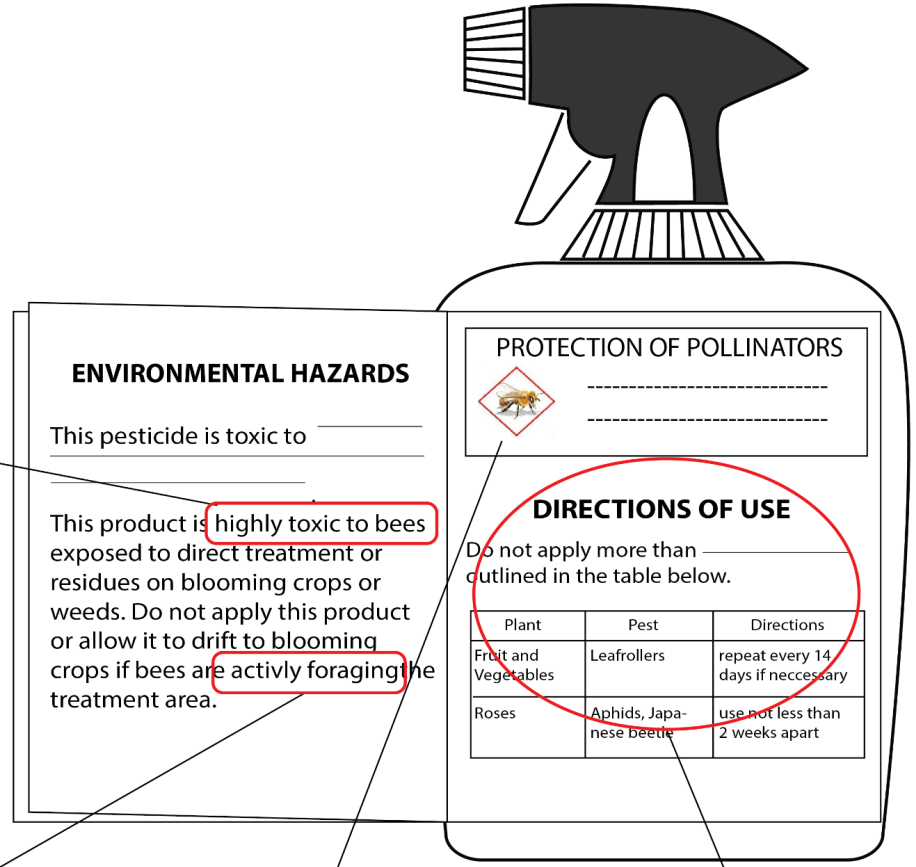
- *Bombus occidentalis* was one of the three most abundant bumble bees in western WA
- The wild populations plummeted in the mid-late 90s, possibly due to disease connected with commercial bee production
- They have a distinctive “white butt” in our area – be pleased if you see one

Three *B. occidentalis* workers

Reminder

- Passive trapping
  - By-catch!
  - More pollinators likely present
  - Role of pollination in cranberry?

PESTICIDE LABELS AND POLLINATORS



1. ENVIRONMENTAL HAZARDS

don't spray when in bloom

wait until full petal fall

2. Residual toxicity

Look out for the words:

1. **foraging** = toxic for longer than 8 hours

2. **actively foraging** or visiting = toxic for less than 8 hours

3. Check for more precautions

Some products have a more comprehensive label with a bee advisory box and icon containing information on routes of exposure and spray drift precautions.

4. Use directions

Follow use directions specific to crop and pest carefully. Effects on bees can change if not applied correctly.

Watch your labels for bee safety

c/o A. Melathopoulos

Be on the look out (BC and WA detects)

ASIAN GIANT HORNET

Asian giant hornet is the world's largest species of hornet. In December 2019, WSDA received and verified four reports of Asian giant hornet near Blaine and Bellingham. These are the first-ever sighting in the United States. Canada had also discovered Asian giant hornet in two locations in British Columbia in the fall of 2019.

Asian giant hornet attacks and destroys honeybee hives. A few hornets can destroy a hive in a matter of hours. The hornets enter a "slaughter phase" where they kill bees by decapitating them. They then defend the hive as their own, taking the brood to feed their own young. They also attack other insects but are not known to destroy entire populations of those insects.

While they do not generally attack people or pets, they can attack when threatened. Their stinger is longer than that of a honeybee and their venom is more toxic. They can also sting repeatedly.

If it becomes established, this hornet will have serious negative impacts on the environment, economy, and human health in Washington State.

“Bug” vacuum

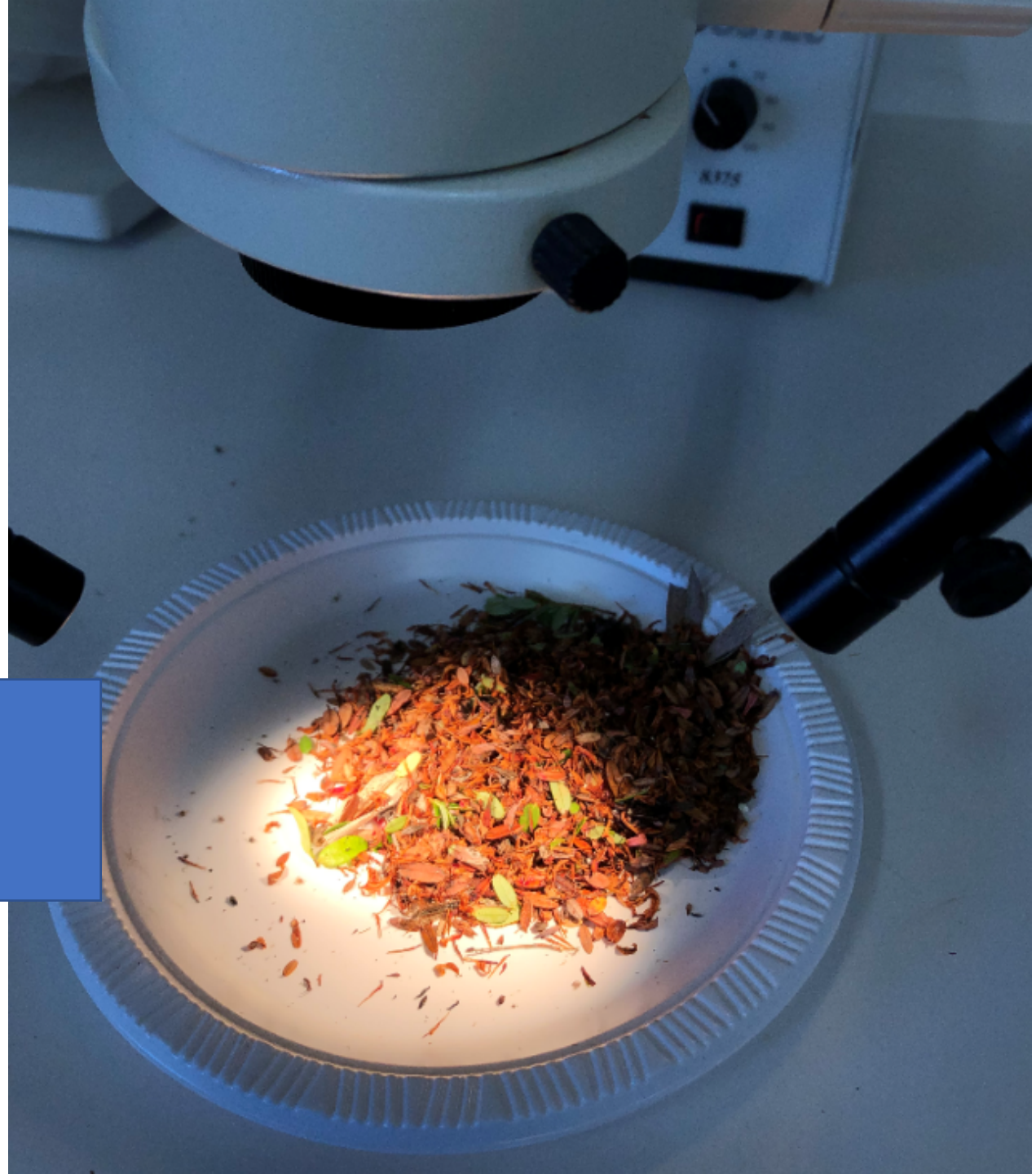
- Can we replace the sweep net?

Set-up

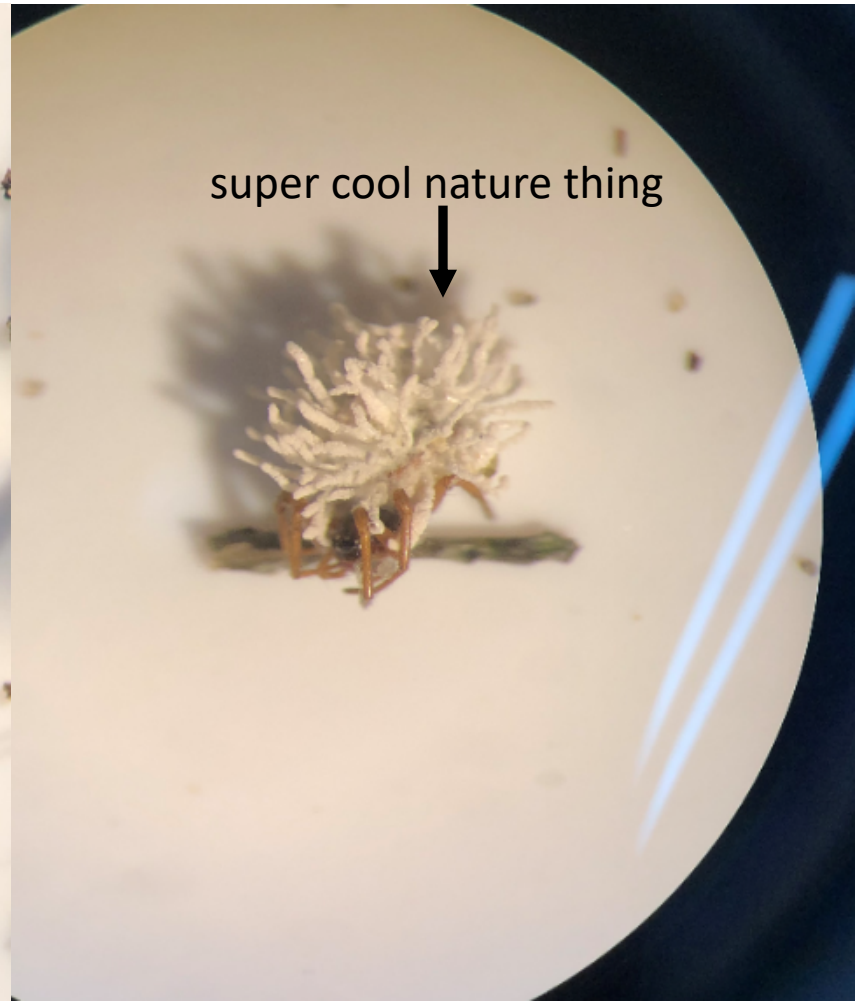
- Four field sites
- Weekly sampling
  - 5 weeks
- 4 paired 25 ft. transects at each site
  - 30 sweeps
  - 30 1 sec. suctions

A visual

Bug vac sample

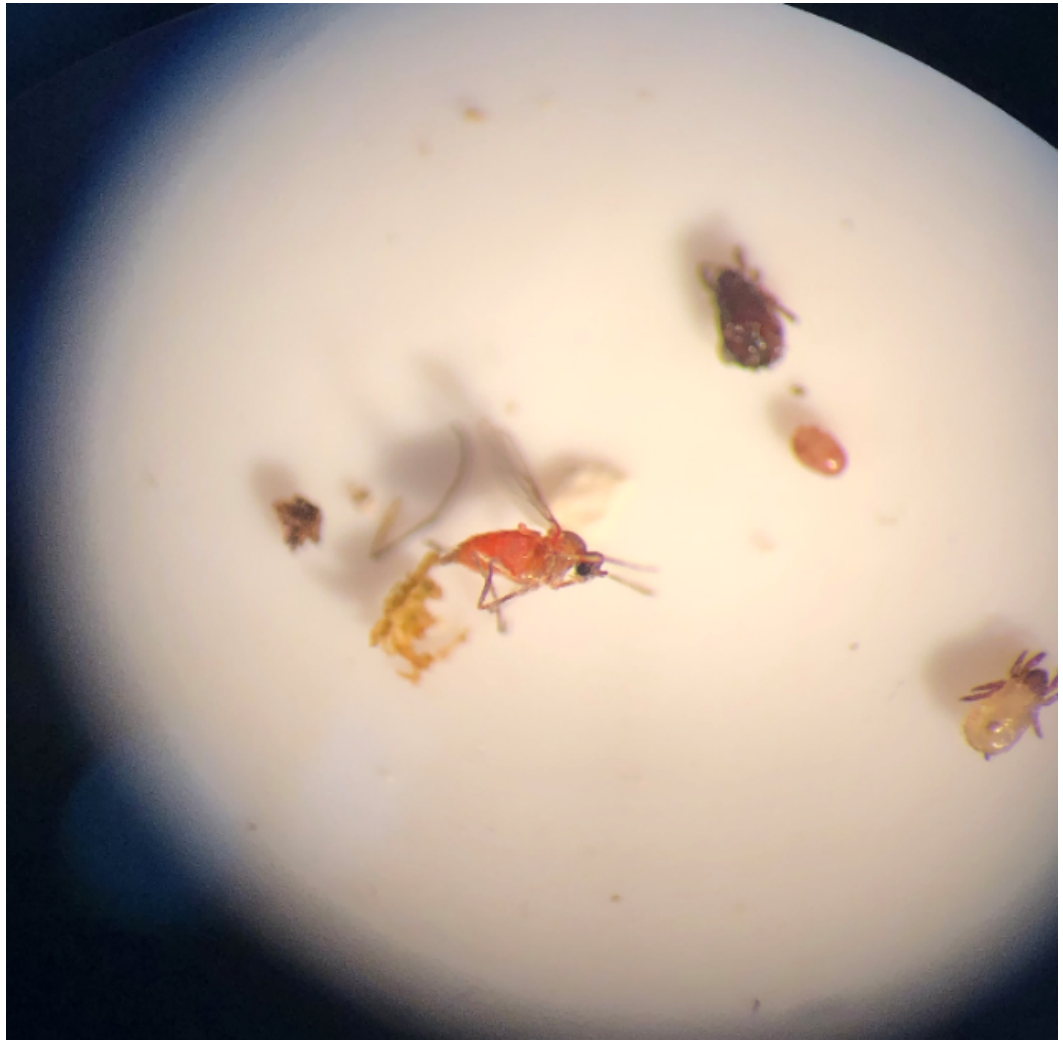


What we find



Weevils, scales, and spiders, oh my!

Tipworm!



adult

larvae

Tipworm refresher

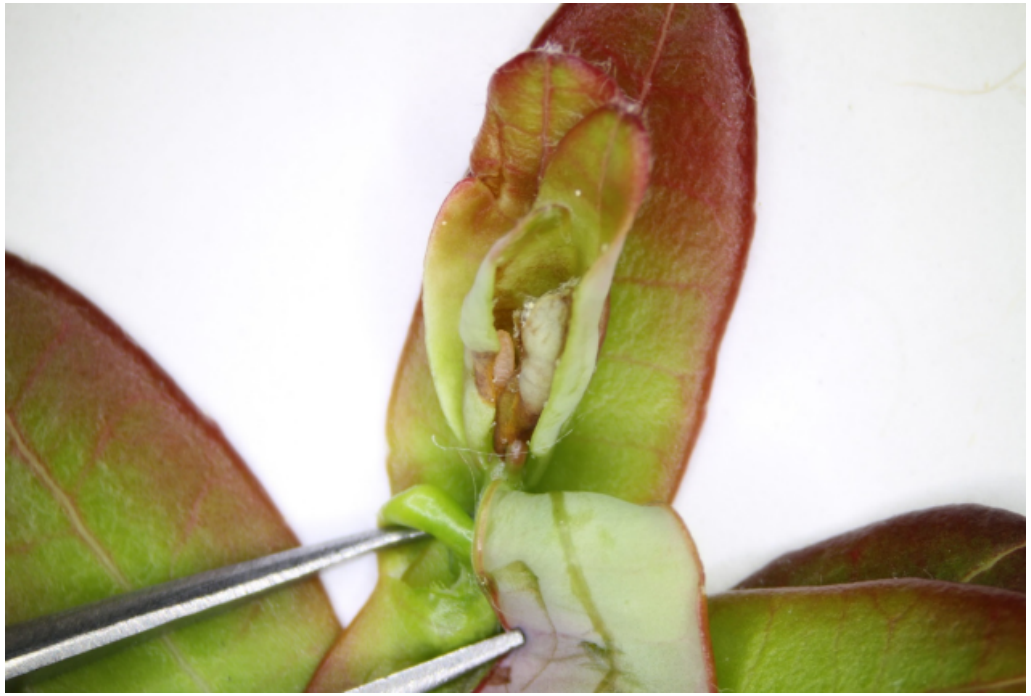
- Midge adult
- Larvae feed on and kill growing tips
  - Prevent bud set
- Can lead to branching, fluffiness
- Multiple generations

c/o M. Elsby


c/o M Elsby

Trapping/monitoring

- Overwintering emergence cage
- Sticky cards
- Upright dissection

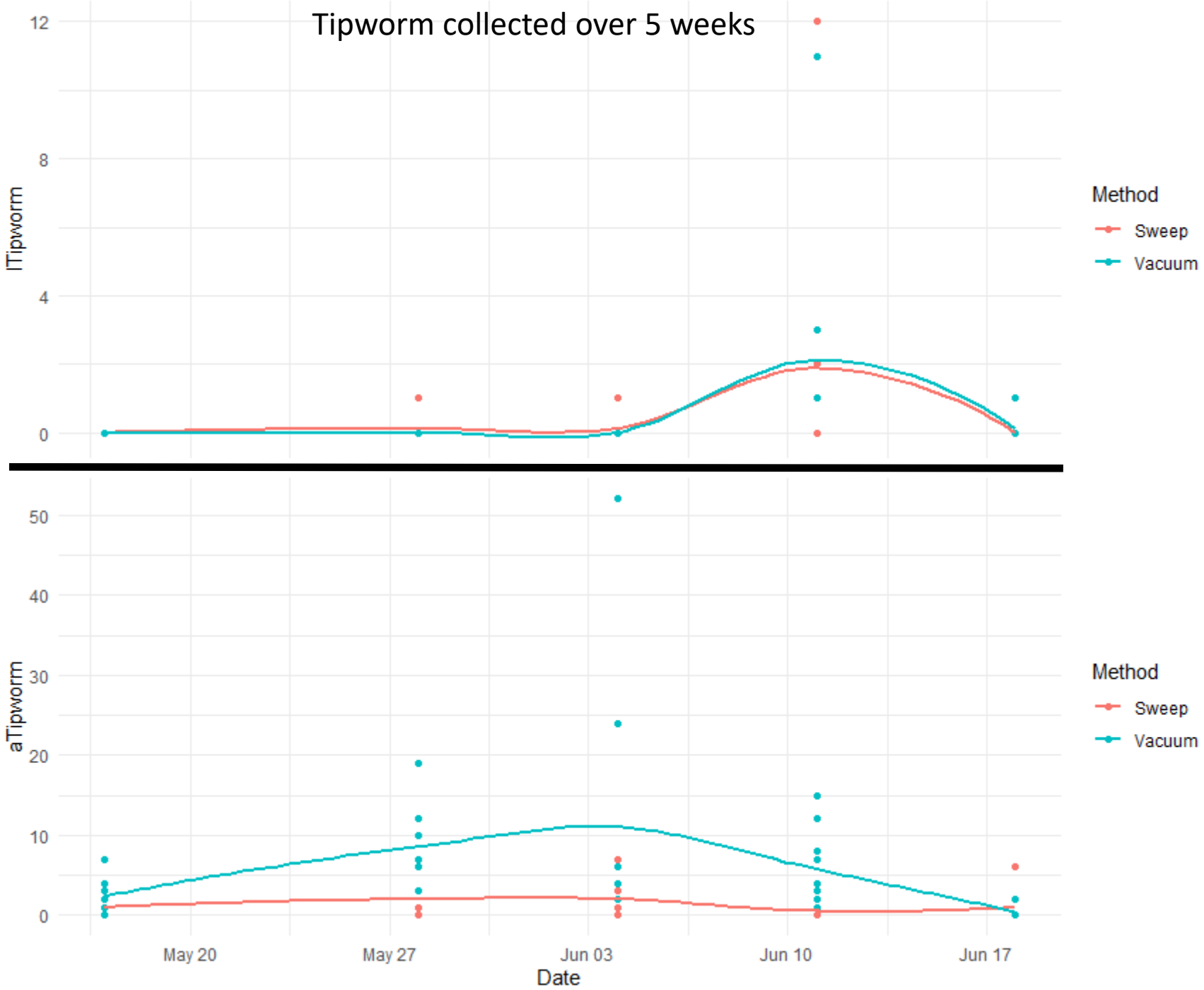


Photos c/o M. Elsby

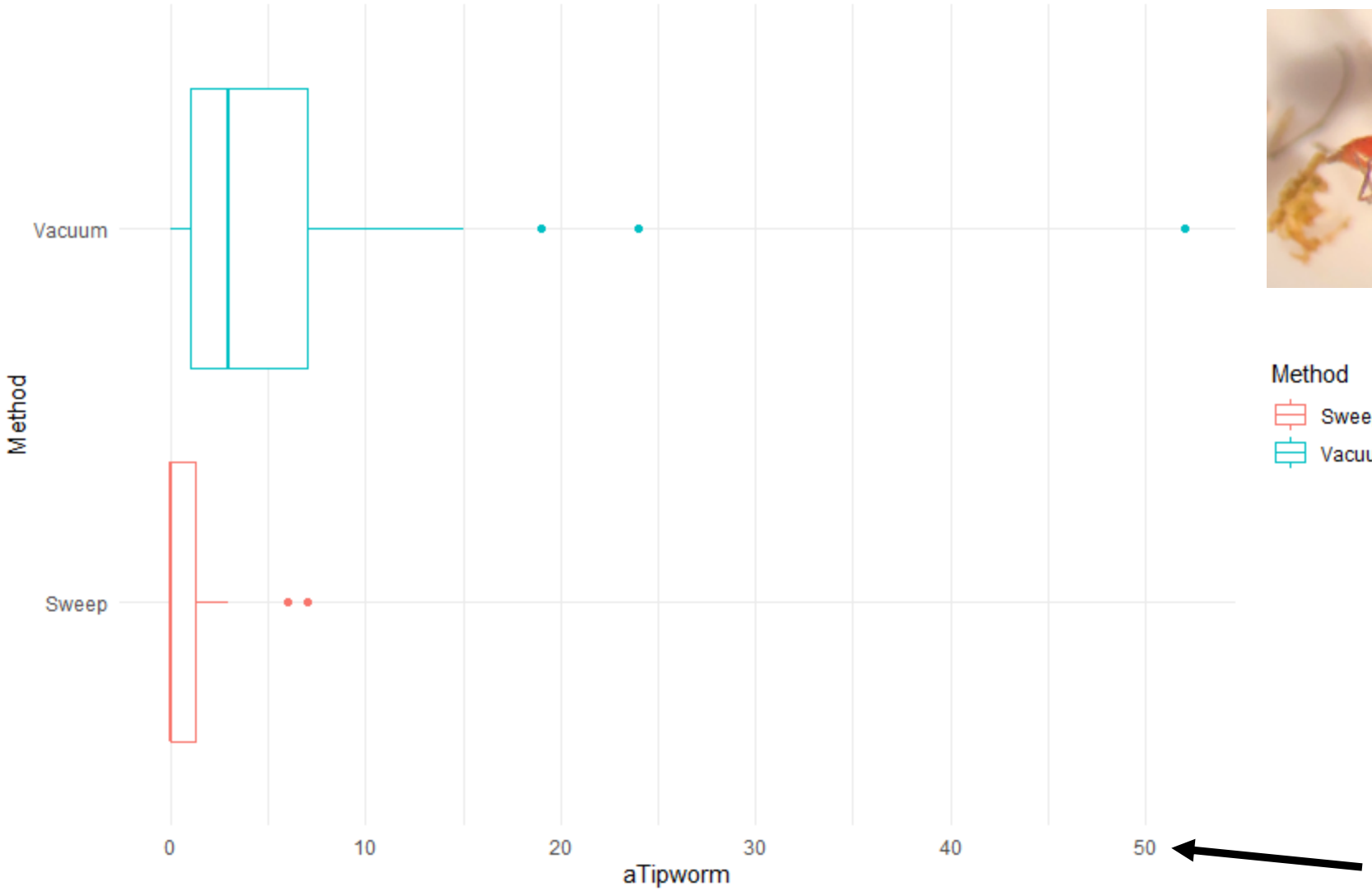
Perspective

- Can you spot the tipworm adult?

Tipworm collected over 5 weeks



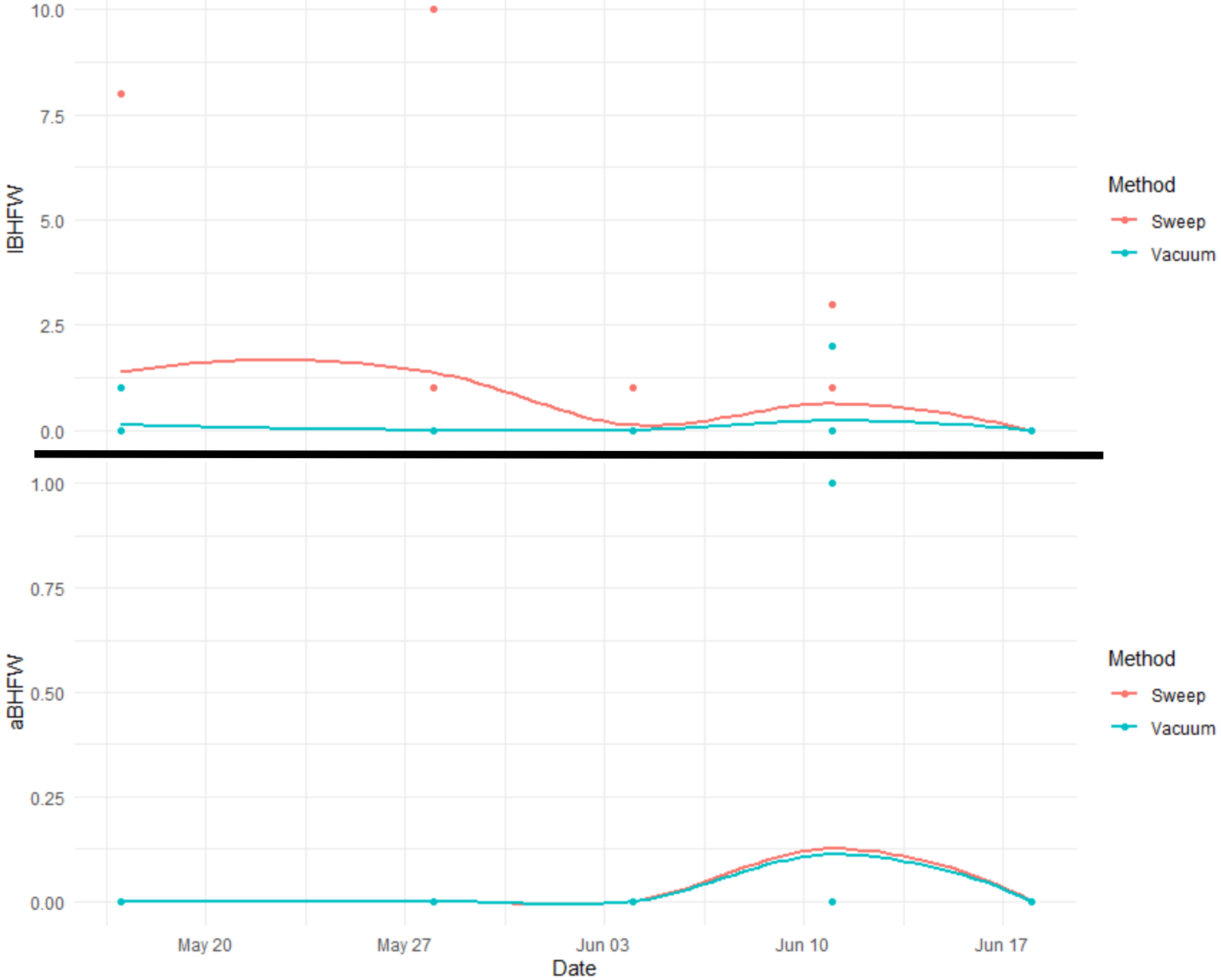
Mean # adult tipworm collected per sample method



What we didn’t find

- This guy (BHFW)

Blackheaded Fireworm collected over 5 weeks

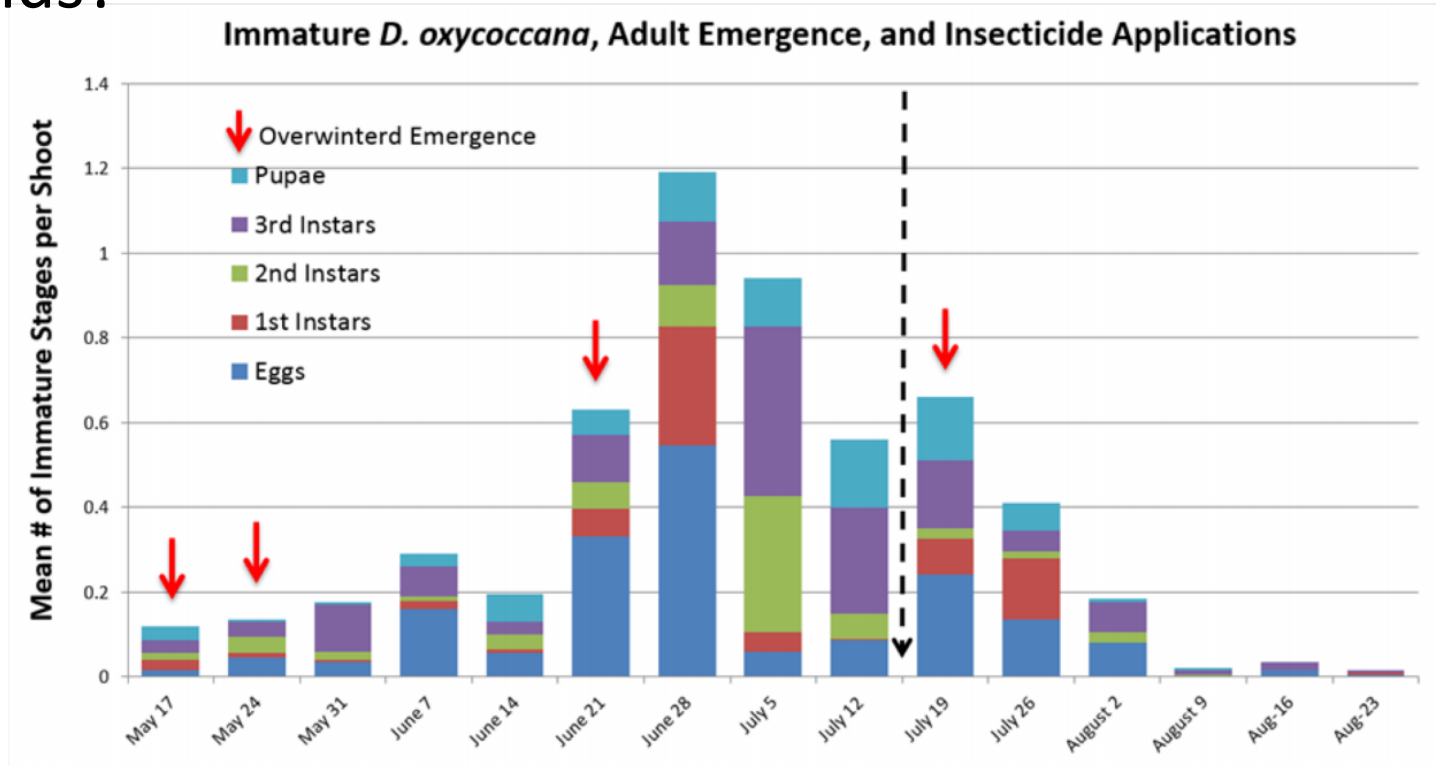


“Bug” vacuum

- So can we replace the sweep net?
  - Probably not ☹

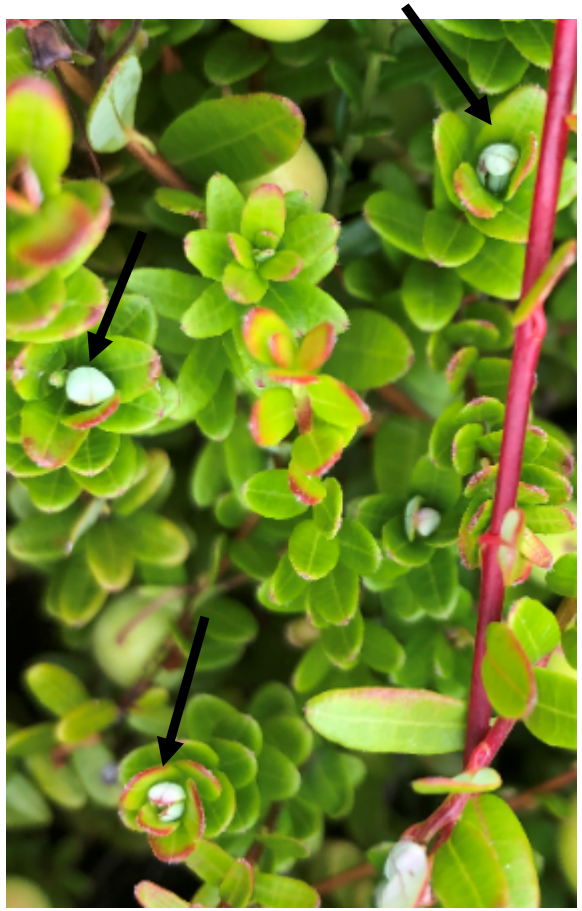
“Bug” vacuum utility

- Timing of spray applications
- Efficacy of insecticides
- Establish economic thresholds?
- Monitoring . . . ?



Future (2020 plan)

- Early detection of adult tipworm
  - Pre-leaf curl
- Timing and efficacy of early spray application
- Grower collaborators?



Alternative fungicide rotation trial

Flashback

Prop 65 in Calif, and No MRL in EU after 2020. Check handler for restrictions. This will be a big deal for 2019.

Legal, but MRL issue for export

Bravo® Fungicide

syngenta.

Re-examination of Mancozeb

- Multi-region project (MA, WI, WA)
- Limited broad-spectrum chemistries (FRAC M Class)
- Important for IPM program/resistance management
- WA research funded by Washington State Cranberry Commission

Objectives

- Compare efficacy against fruit rot and fruit quality of programs including Bravo, Quadris Top, Proline, and Manzate
- Evaluate impact of Manzate on fruit color and berry size
  - Concerns about delay of color and decreased berry size

Trial set-up

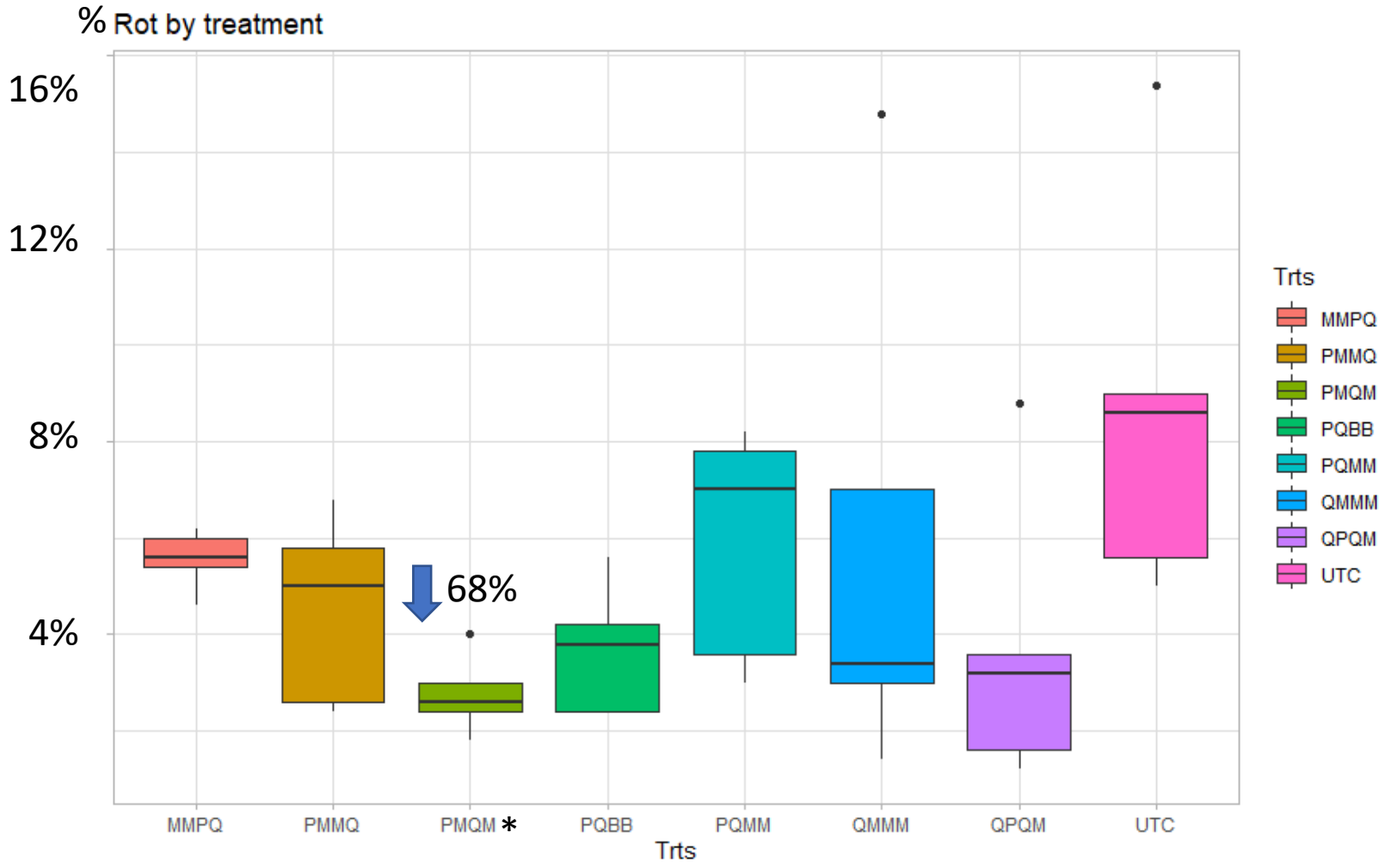
- 8 treatments
- 5 replications
- Randomized block design
- 6’x6’ plots
- 600 gpa “chemigation” water rate
  - High label rate product
- 4 fungicide applications/treatment
- Variety: GH1

Treatment	Early bloom	Mid-bloom	Mid-bloom	Out of bloom
1	Proline	Manzate	QT	Manzate
2	Manzate	Manzate	Proline	QT
3	Proline	Manzate	Manzate	QT
4	Proline	QT	Manzate	Manzate
5	QT	Proline	QT	Manzate
6	QT	Manzate	Manzate	Manzate
7	Proline	QT	Bravo	Bravo
8	-	-	-	-

1	5		4	Alley	8		2
	8		7		6		5
	3		1		7		4
	6		2		3		1
2	6		5		2		3
	7		1		8		6
	3		2		4		1
	8		4		5		7
3	7		3				
	1		5				
	8		4				
	6		2				

Field rot results

- Inconsistent
  - Generally less w/fungicides
- Proline-Manzate-QT-Manzate
  - 2.7% vs 8.7% UTC



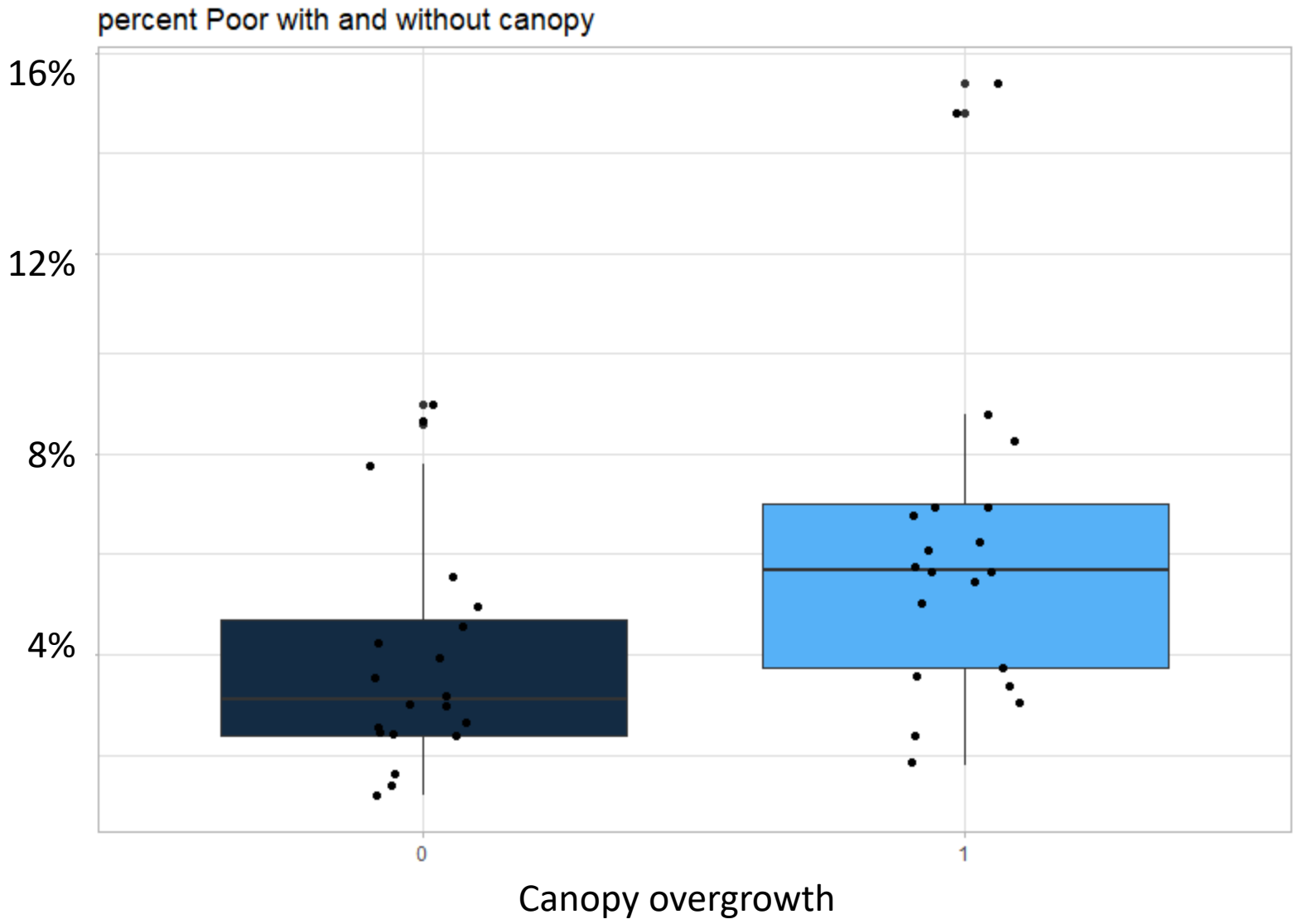
500 g samples/plot

Presence of Canopy

Low/no excess vine

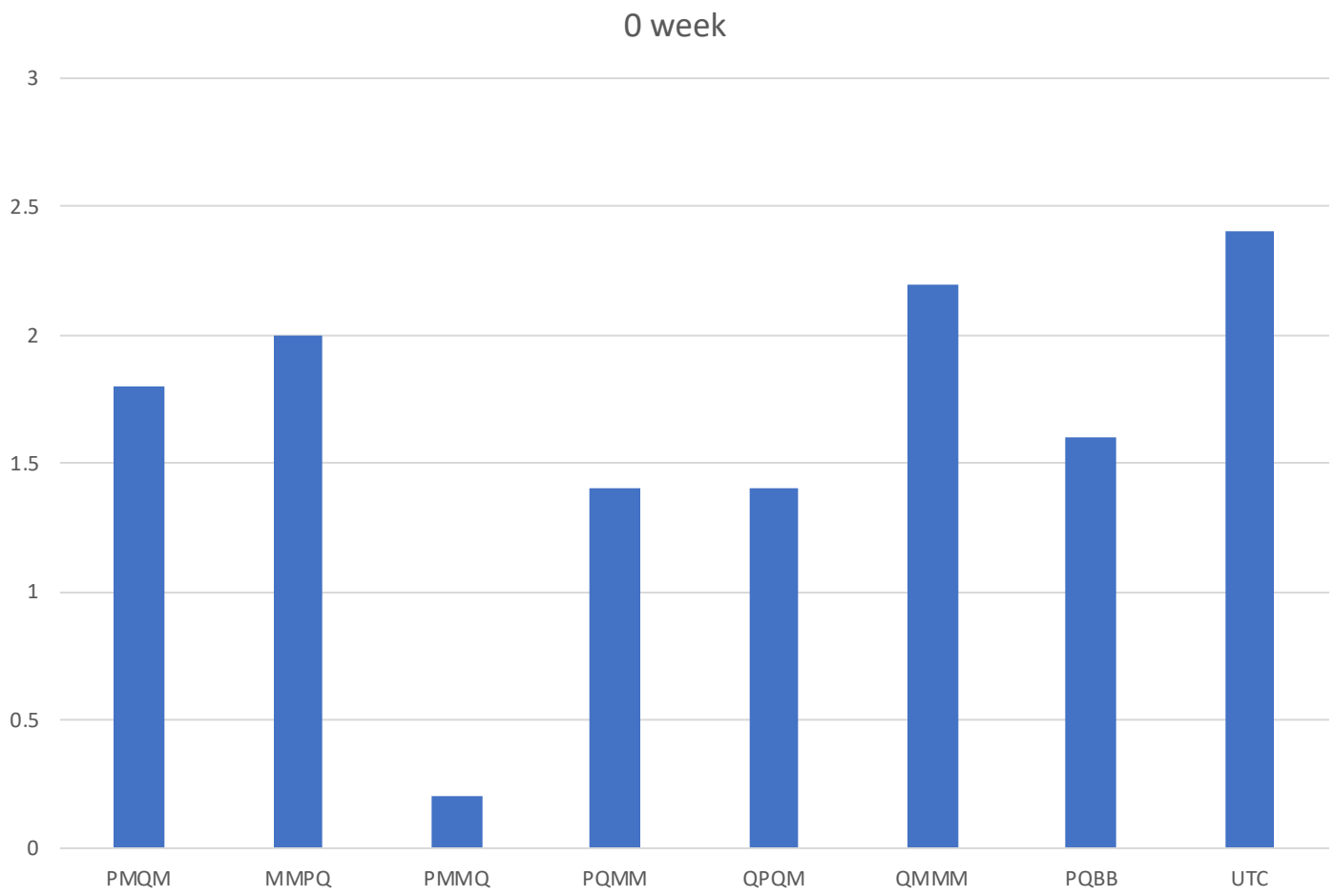
High excess vine

- Regardless of treatment, higher rot with canopy overgrowth
- Control of canopy is an important part of disease management
  - Easier said than done



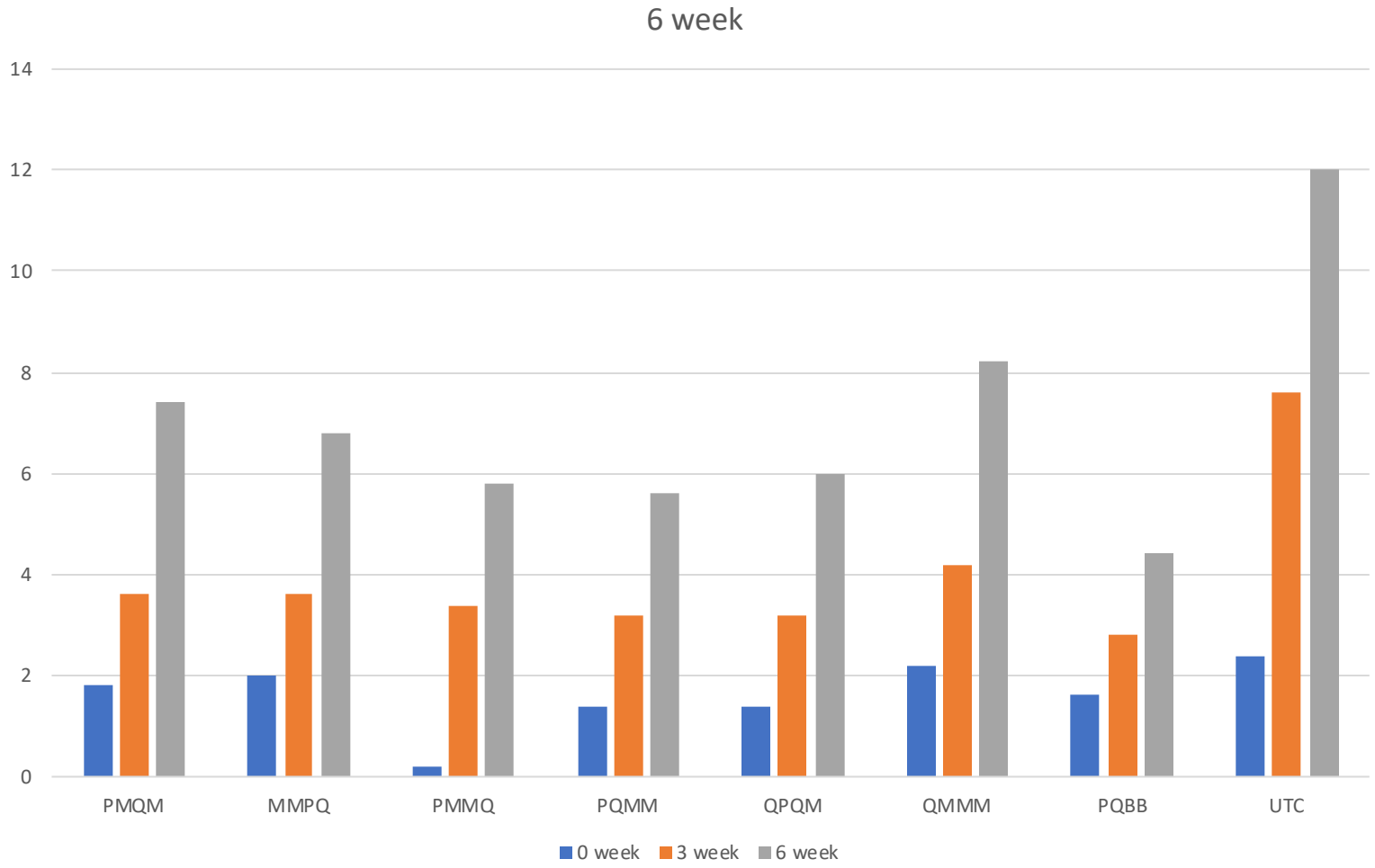
Storage rot

- Fresh fruit assessment
  - 5 lb sample, blocks pooled (no stats)
  - % poor low across treatments



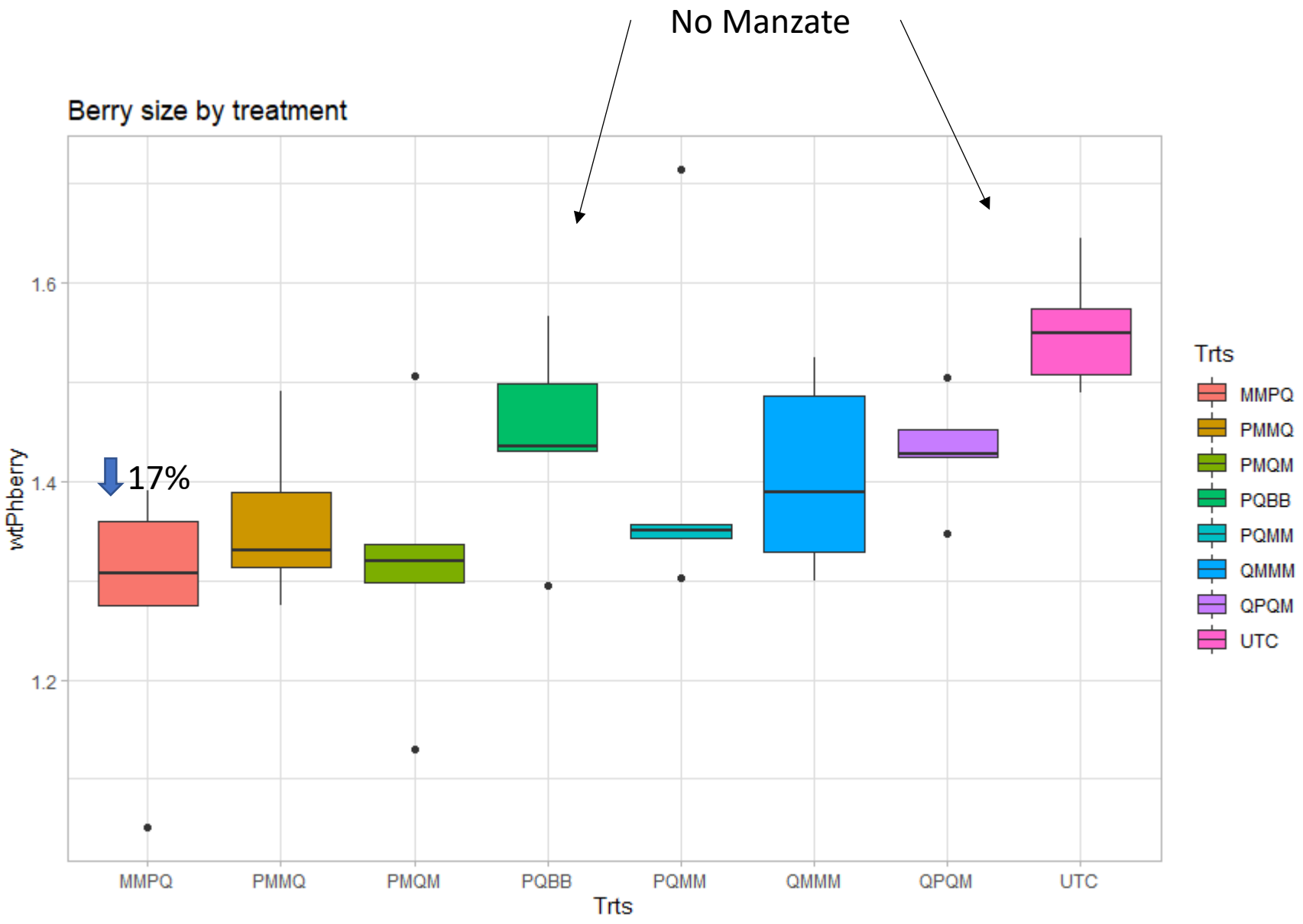
Storage rot cont.

- Take-away: less storage rot with fungicide applications



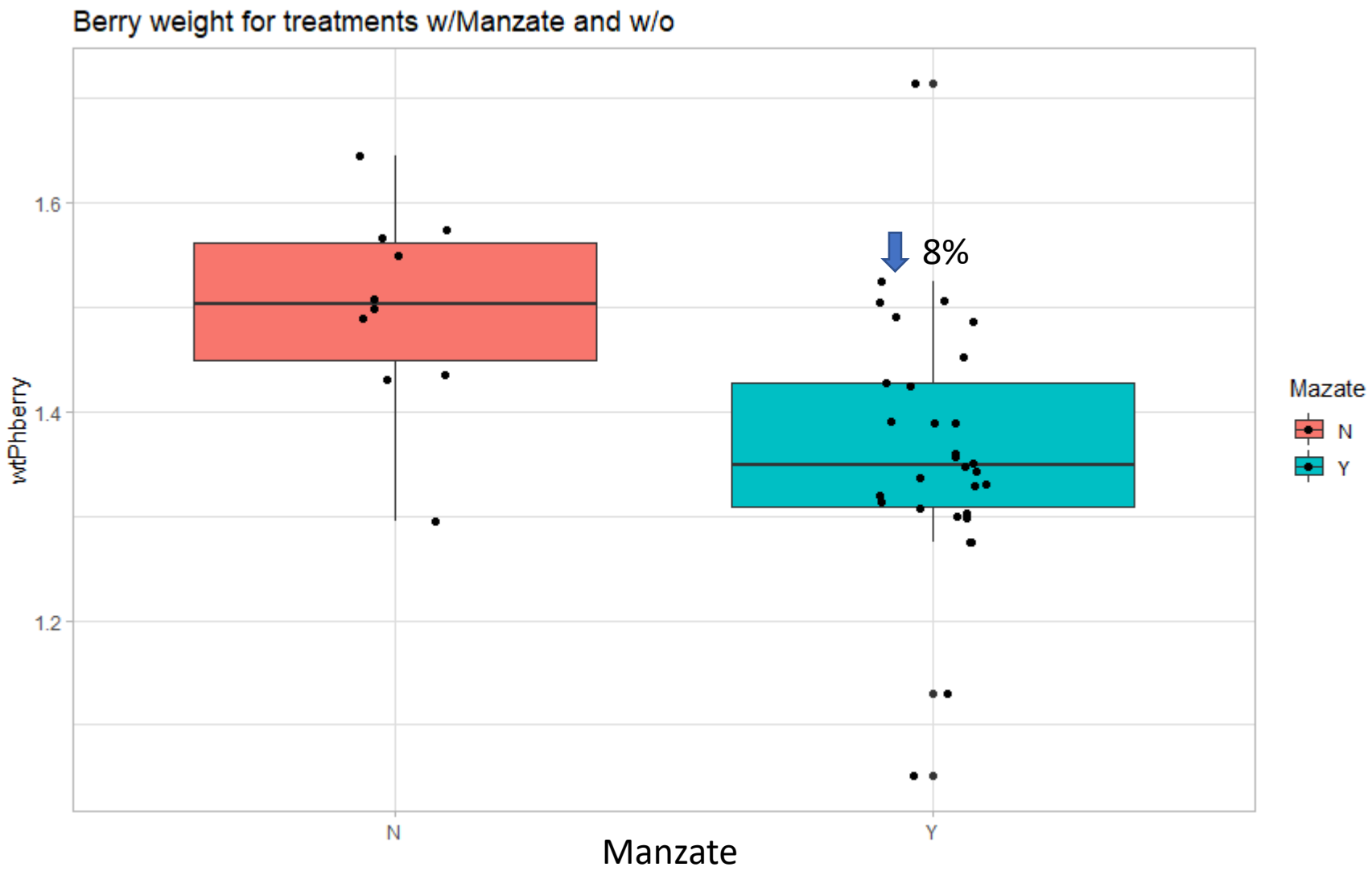
Berry size

- Decrease in berry weight with fungicide applications
- Note: size here based on average berry weight (g) per “healthy” berry



Berry size cont.

- Decrease in berry weight in treatments with Manzate

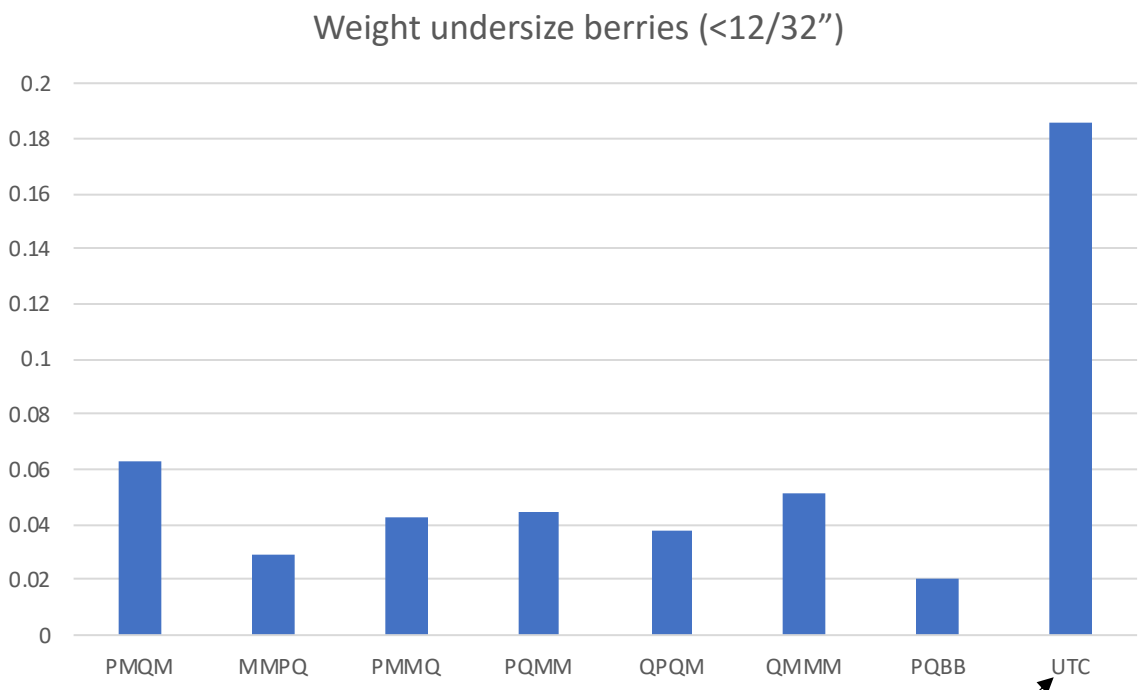


Berry size cont.

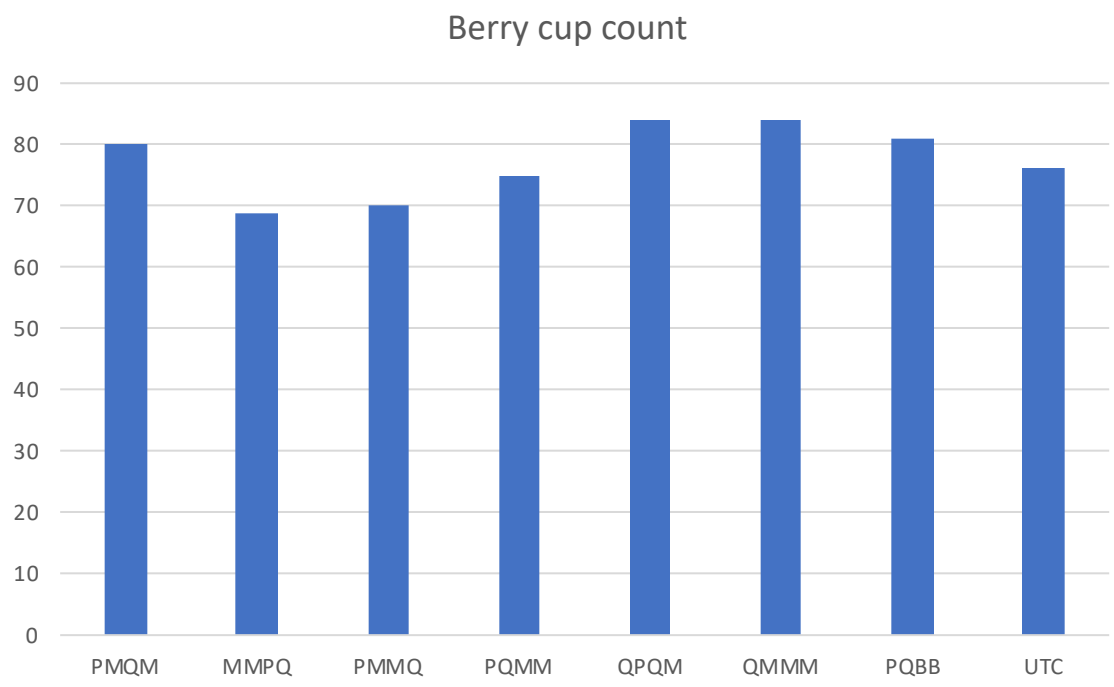
- Caveats?
  - Decreased berry weight not necessarily = decreased yield
  - Yield data were not collected
    - ~2.2 pound samples/plot

Berry size cont.

- Caveats?
  - Fresh fruit assessment

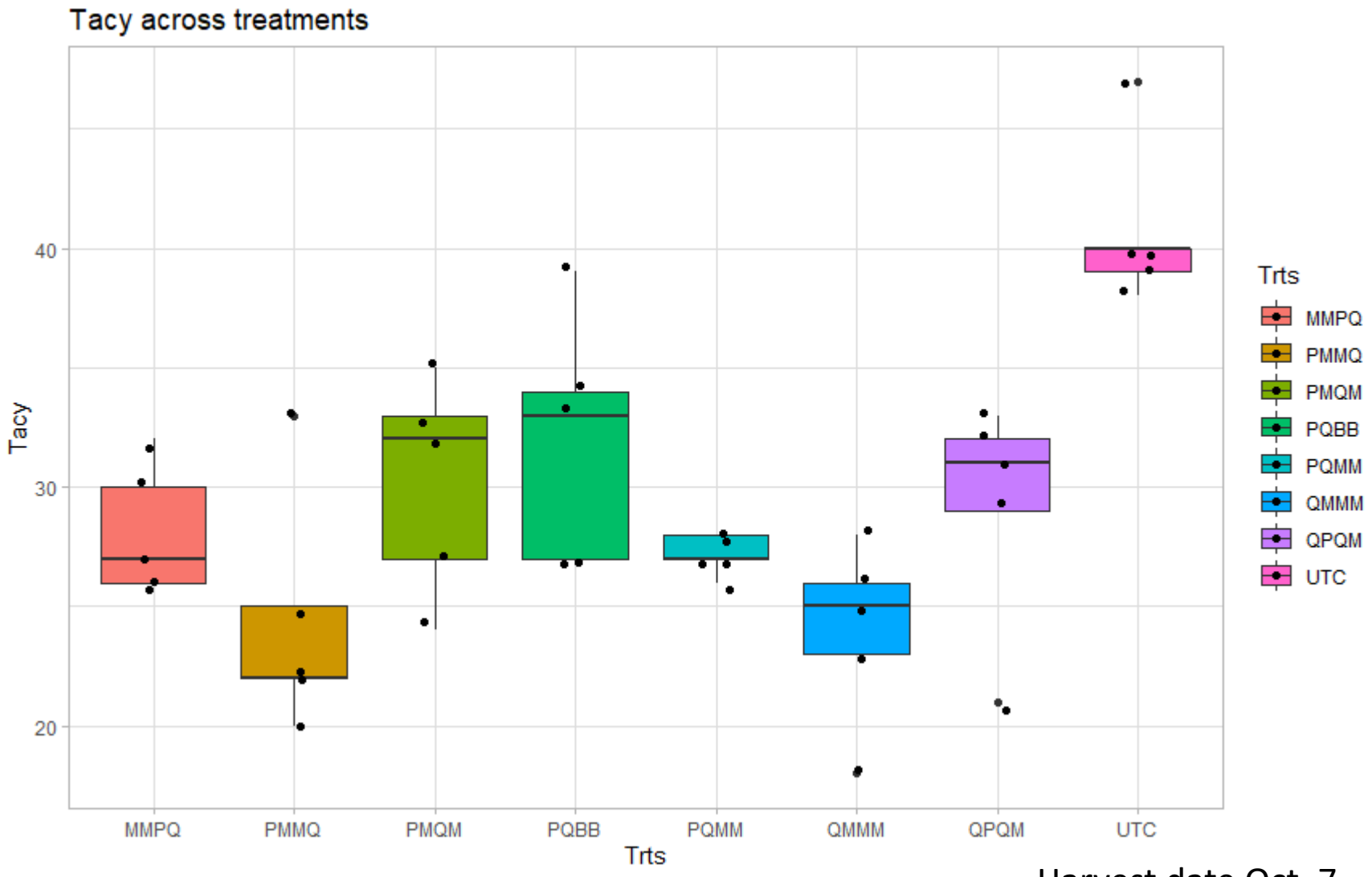


Could include rot fruit



Tacy

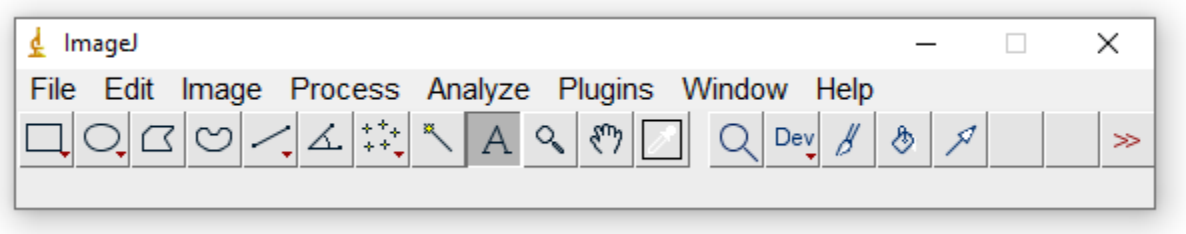
- Decreased tacy with fungicide applications
- Some interaction effect from canopy overgrowth



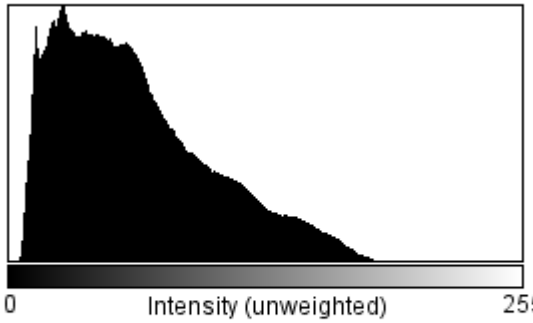
Harvest date Oct. 7

Novel image analysis for berry color

- Image processing program
  - ImageJ
- Requirements
  - High definition image (lots of pixels)
  - Consistent lighting
  - Consistent lens distance
- Process (in development)
  - Convert image to grey-scale
  - Count pixels based on grey-scale
  - Mean grey-scale gives color value (lower #=darker, higher #=lighter)
- **Not DigiEye**



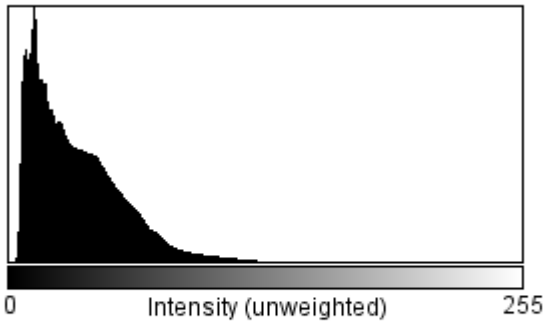
300x240 pixels; RGB; 281K



Count: 5025708
Mean: 62.538
StdDev: 38.315

Min: 0
Max: 188
Mode: 26 (61363)

300x240 pixels; RGB; 281K

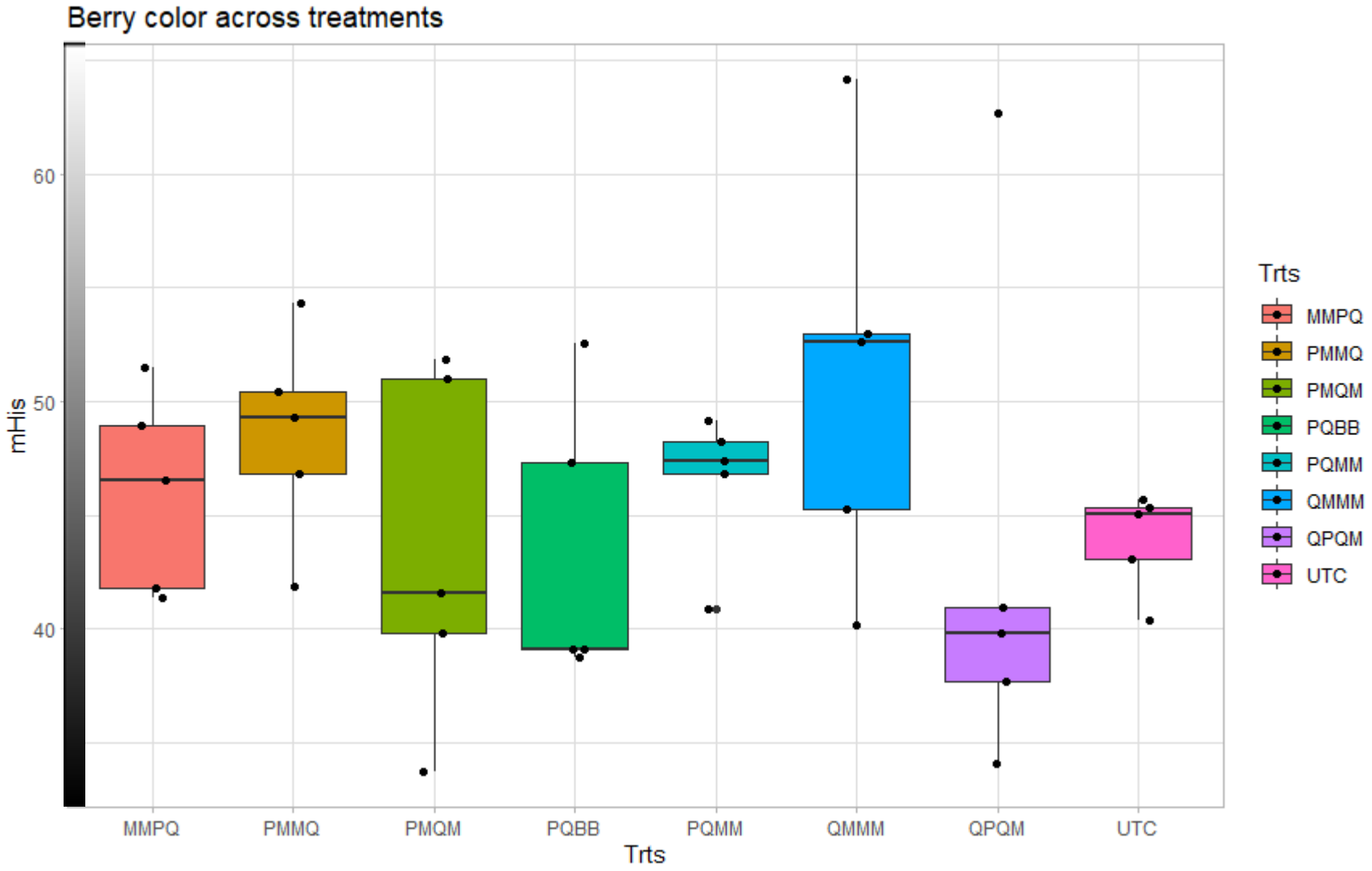


Count: 4838148
Mean: 33.342
StdDev: 23.093

Min: 0
Max: 201
Mode: 12 (148561)

Berry color

- No impact from fungicides on berry skin color
- (very basic image analysis, need more validation)



Wrap-up

- Application of fungicides = decrease in field/storage rot
  - 4 applications appropriate for all? unlikely
- Manzate appeared to decrease berry weight and tacy, but not berry skin color

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Questions?