

Fate of Vine Mealybug in Winery Waste

**UCCE Sonoma County Grape Day
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Survival of vine mealybug in a winery press

- Two wineries “volunteered” – in northern and southern Sonoma county
- South winery – used *very infested fruit*
(100% of clusters infested)
- North winery – used *moderately infested fruit*
(44% of clusters infested)

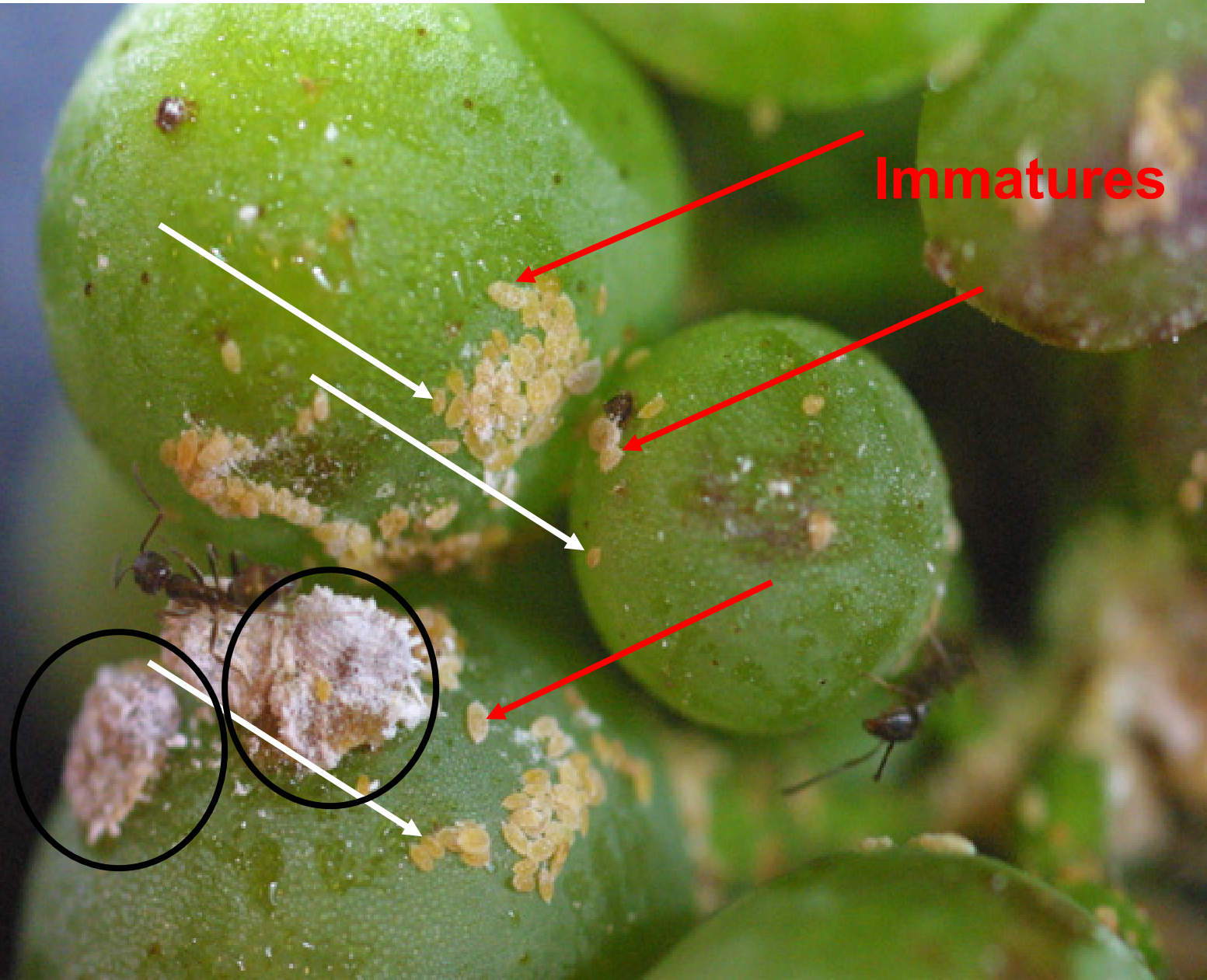
BT bag 2 bin 1

SOUTH WINERY PRESS LOAD: Only infested clusters were placed inside the mesh bags. **ALL clusters placed into bags were infested.**

crawlers

Immatures

Adult females



South Winery - Press Regimen

(Standard Practice: load usually taken to 2.0 bars in two hours)

- One hour at 0.2 bars (6 cycles)
- Second hour unknown
- One hour from 0 – 2.0 bars (6 cycles)
- Press opened and load checked
- Half-hour from 0 – 1.6 bars (3 cycles)



After pressing, clusters removed from bags placed on a sticky card



**Crawlers, immatures and adult females were
counted on sticky card after one week...**



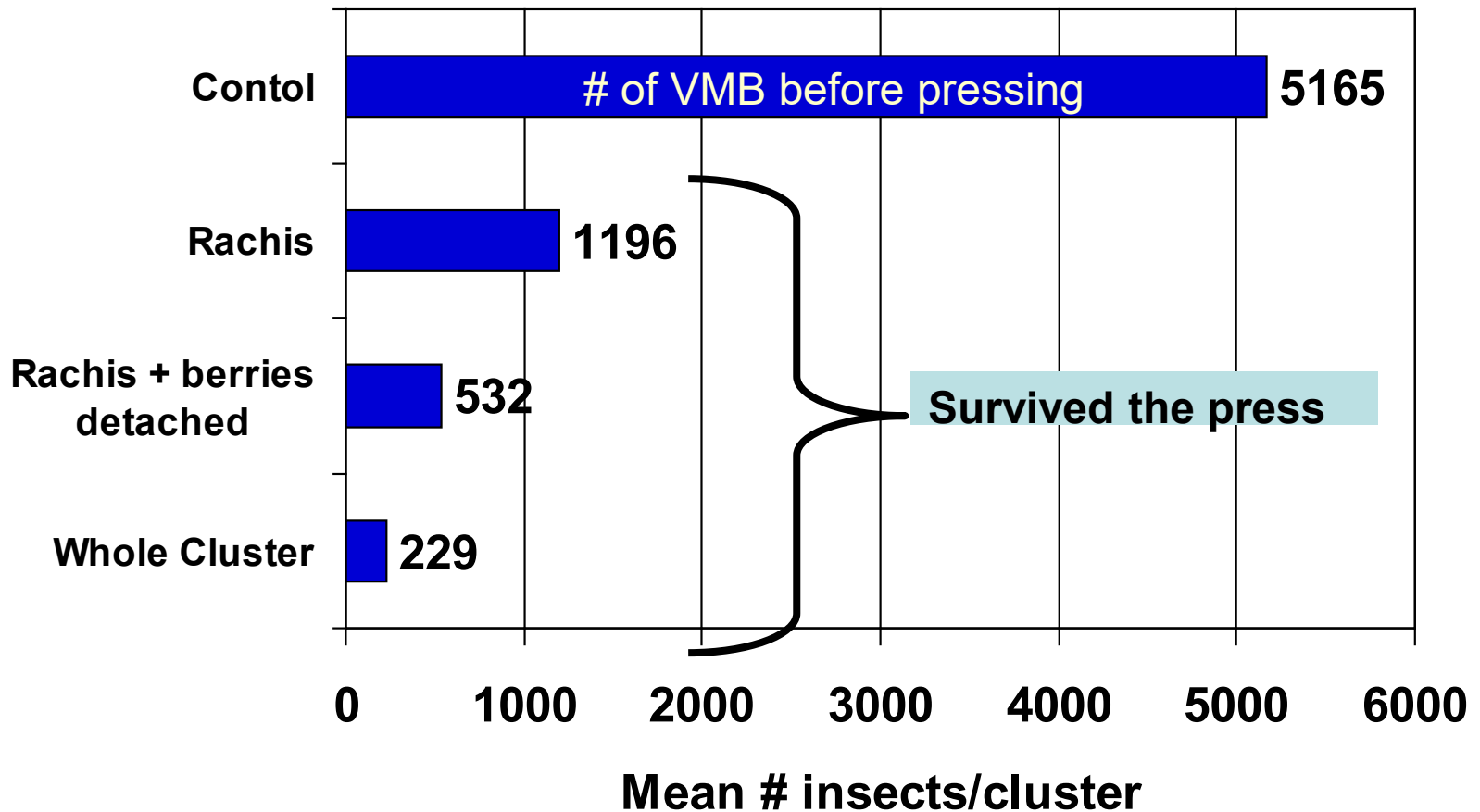
...or estimated



Rachises transferred to new cards once a week



Number of VMB per cluster – Before and After pressing



South Winery summary

Control (what went into the press):

- 100% of the clusters were infested
- Each cluster had an average of 5165 insects
- Actual counts ranged from 1777 to 9879 per cluster

Post press:

- 100% of the clusters remained infested
- Severity ranged from an average of 229 to 1196 insects per cluster

North Winery - Press Regimen

(Standard Practice: load usually taken to 1.8 bars in two hours)

- 25 minutes at 0.2 bars (3 cycles)
- Two hours at 0.4 bars
- One hour from 0.4 – 1.5 bars
- Press opened and load checked
- 20 minutes from 0 – 1.8 bars (1 cycle)

% Infestation and # of VMB before and after press

	What Was Harvested	Bags with just infested clusters	Bags with random clusters
<u>Pre Press</u>			
% Infestation	44%	100%	44%
# VMB/cluster	107	107	107
<u>Post Press</u>			
% Infestation	-	4%	0%
# VMB/cluster	32 insects/ 1400 rachis	.04	0

North Winery summary

Control (what went into the press):

- 44% of the clusters were infested
- Each cluster had an average of 107 insects
- Actual counts ranged from 0 to 2000 per cluster

Post press:

- Several pounds of loose pomace had survival of 2 bugs/100 rachises
- Infested clusters placed inside mesh bags had survival of 4 bugs/100 rachises
- Random clusters placed inside mesh bags had no survivors

Conclusions

- It is possible for vine mealybugs to survive the winery's whole cluster press and be present on pomace.

Survival of vine mealybug on pomace piles made from whole cluster press loads



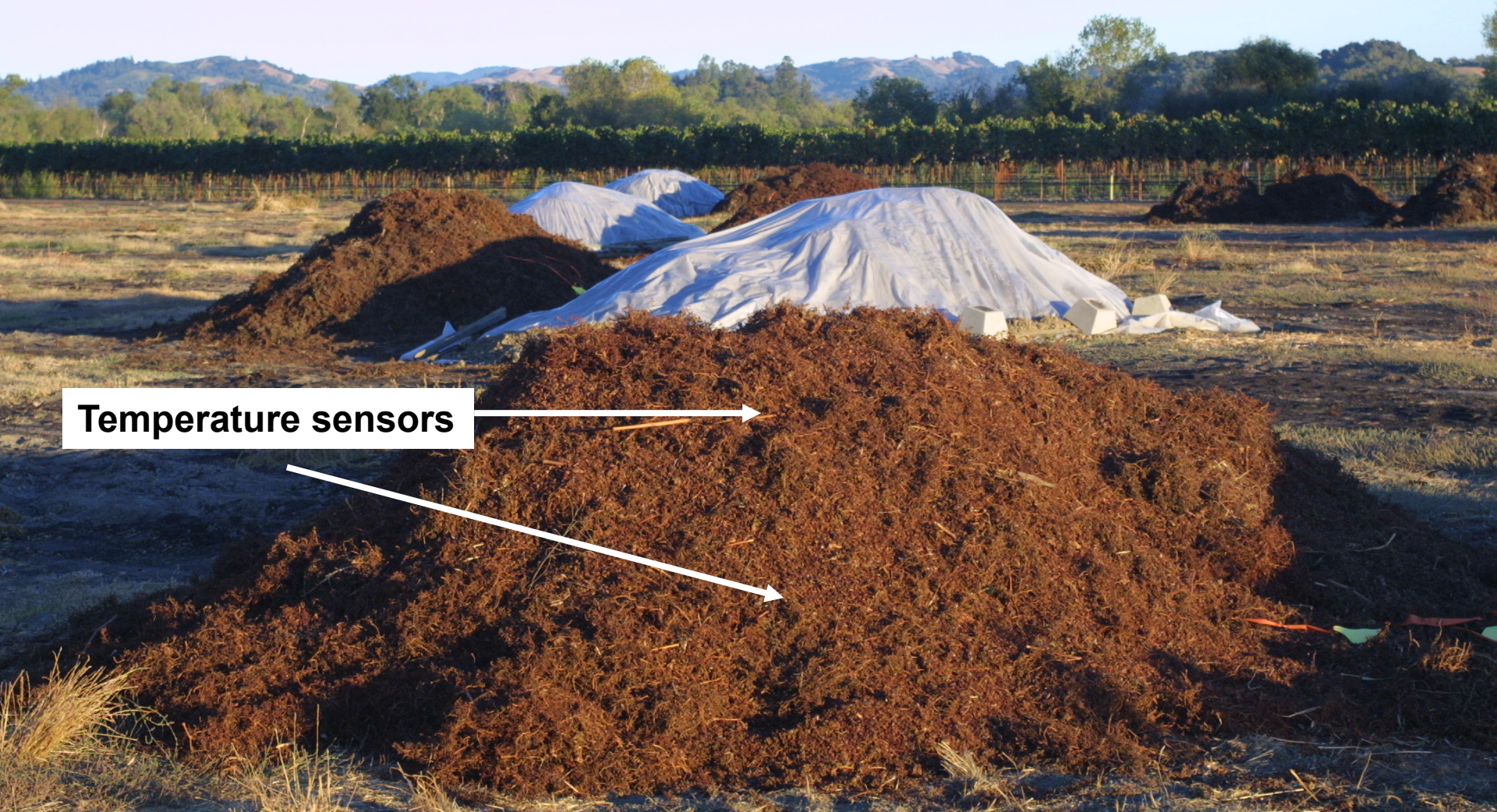


Each mesh bag contains 4 rachises.

The average number of insects present on each rachis when it was buried was 1211.

“Round Piles” created 9-10-04

Two bags of rachises were collected from each pile once a week for 4 weeks.



Temperature sensors



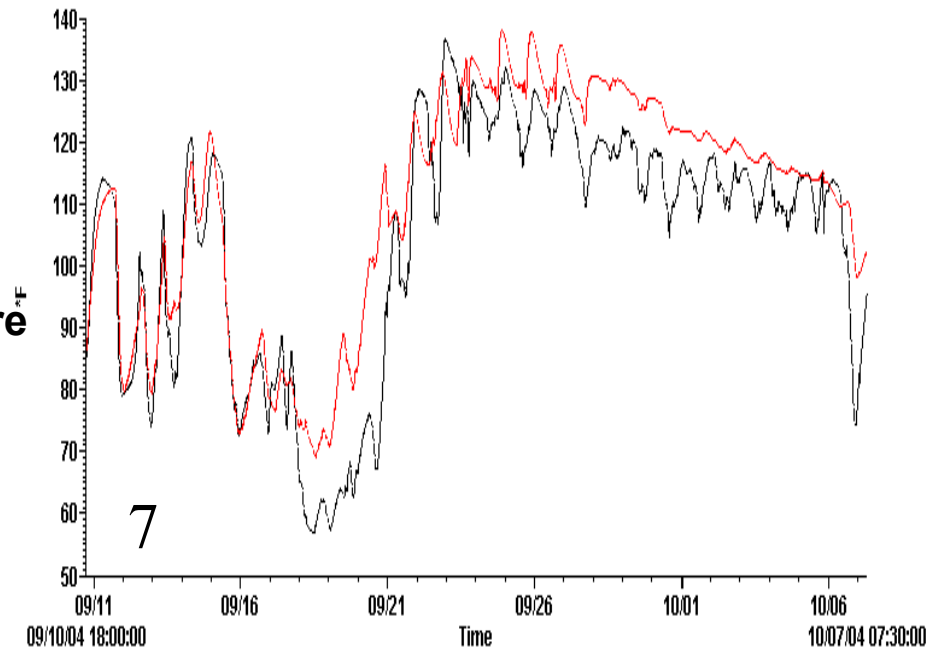
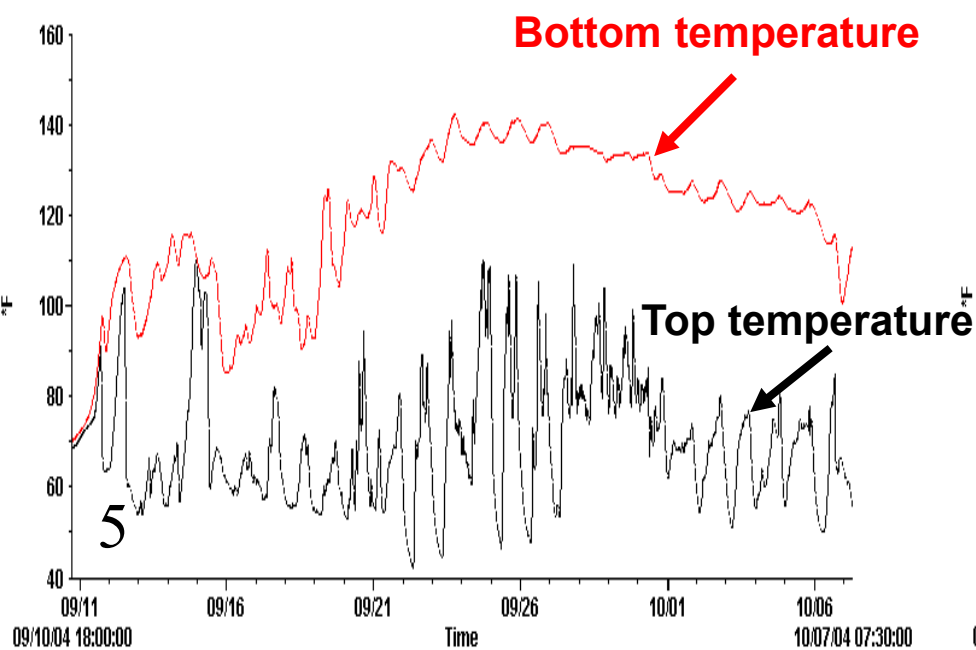
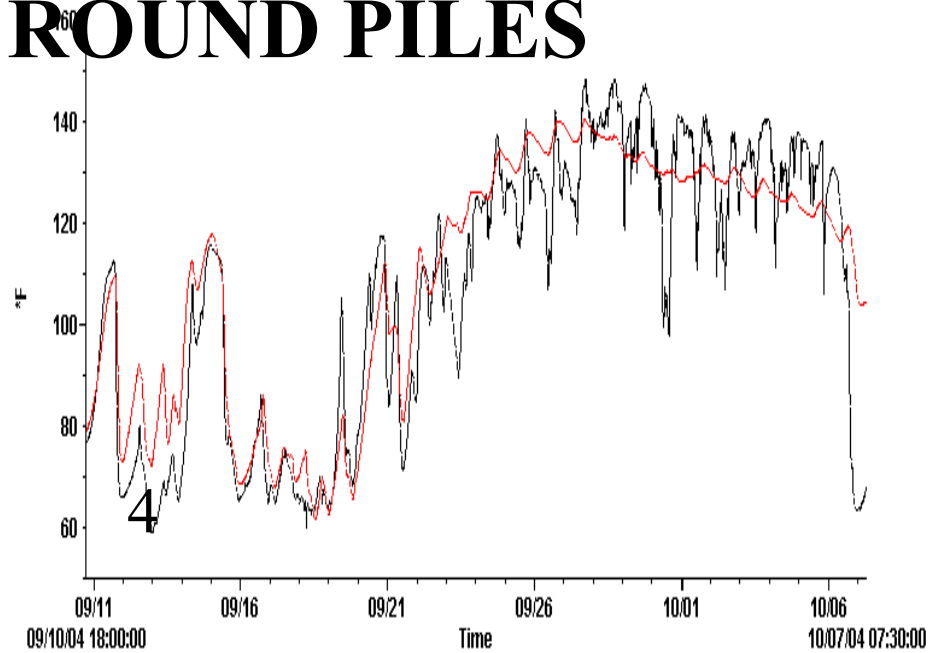
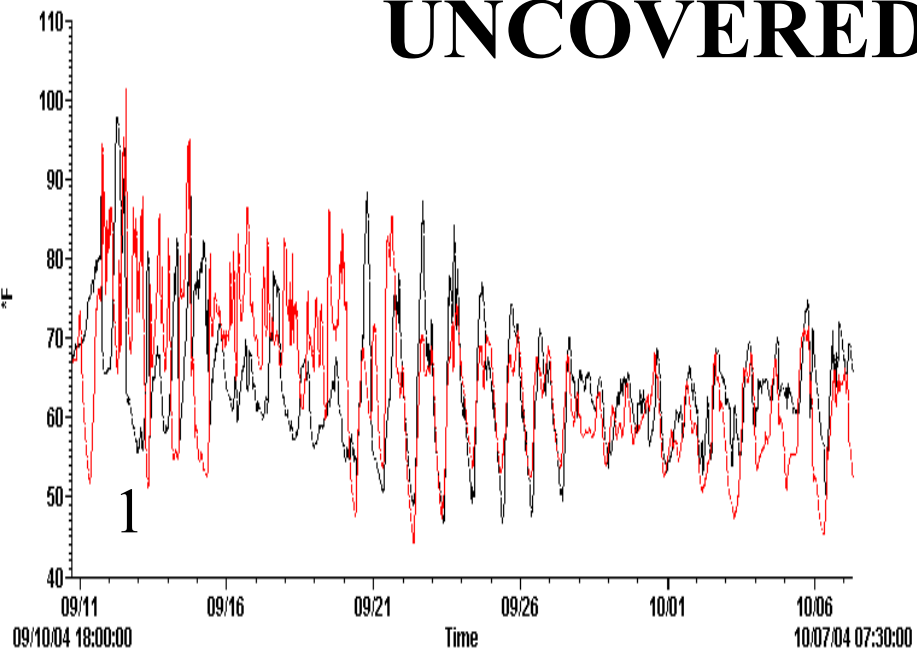
Very “stemy” pile



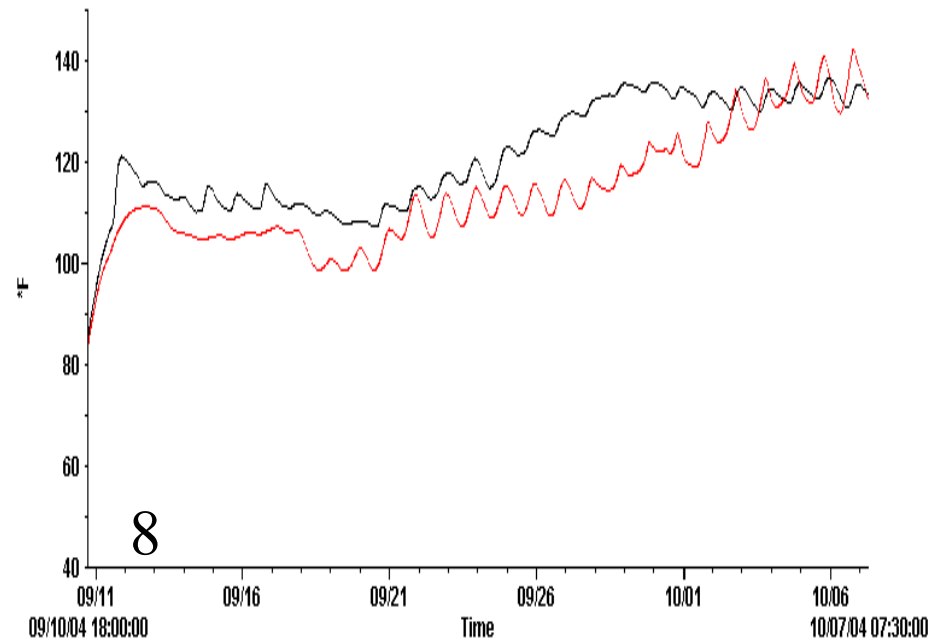
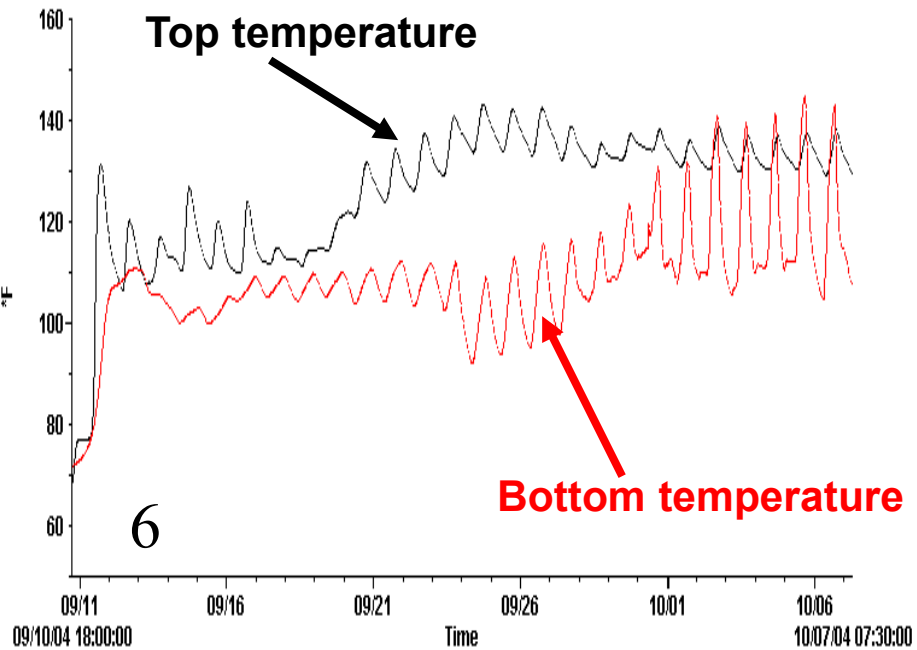
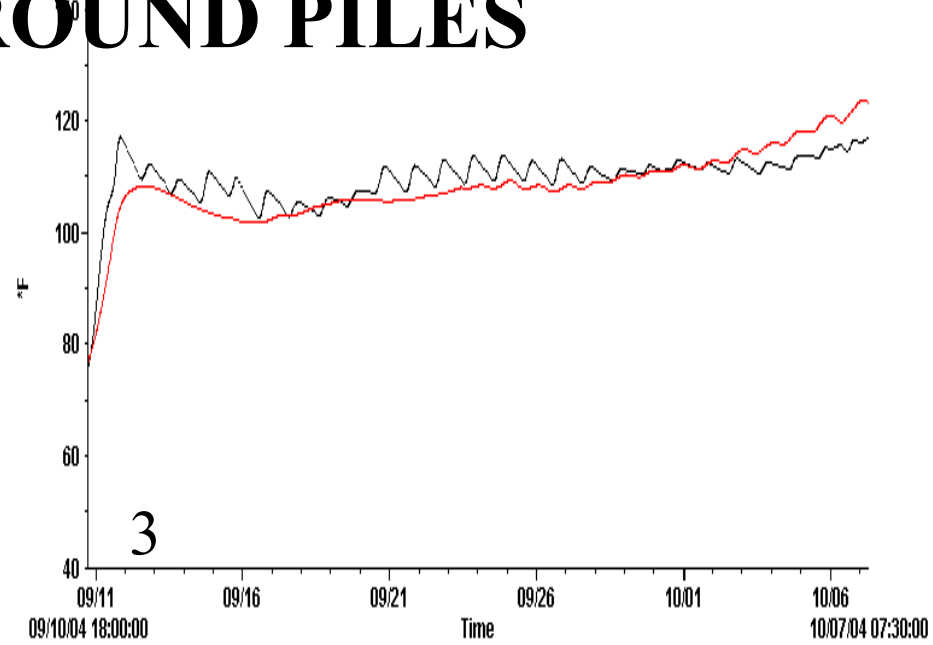
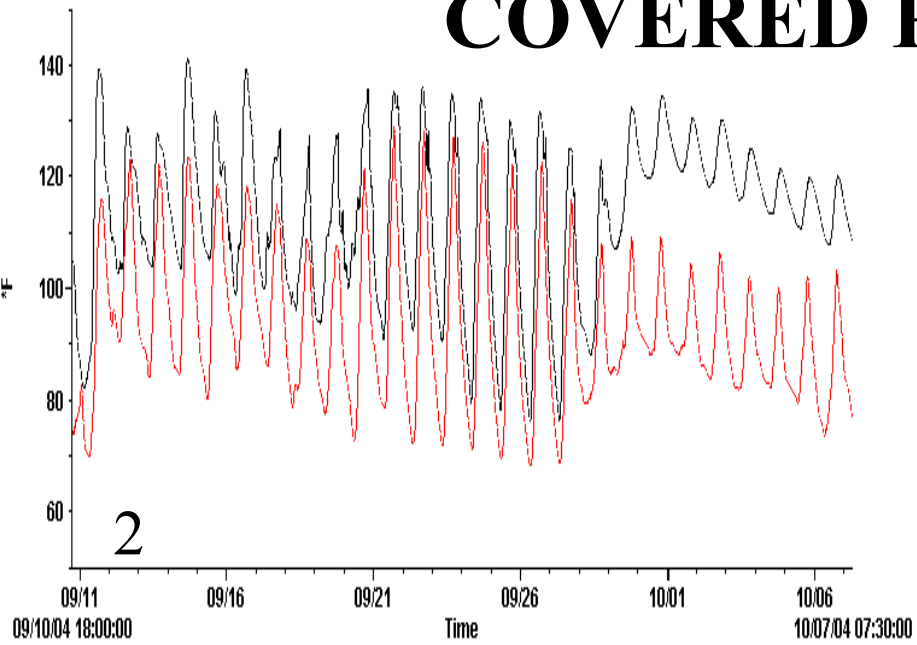
**More skins / seeds and
less stems**



UNCOVERED ROUND PILES



COVERED ROUND PILES



Average number of insects per rachis

(% survival from original 1211 insects/rachis)

Rachis removed from **UNCOVERED** piles after

General Pile Type		ONE wk	TWO wks	THREE wks	FOUR wks
Mostly Stems	Pile TOP	392 (32%)	290 (24%)	577 (48%)	129 (11%)
	Pile BTM	476 (39%)	386 (32%)	328 (27%)	151 (12%)
Mostly skins/seeds, few stems	Pile TOP	0.8 (<0.1%)	1.6 (0.1%)	0.1 (<0.1%)	0.1 (<0.1%)
	Pile BTM	0.7 (<0.1%)	0.1 (<0.1%)	0.7 (<0.1%)	0.0 (0%)

Rachises observed from the date they are removed from the piles until insects no longer found

Average number of insects per rachis

(% survival from original 1211 insects/rachis)

Rachis removed from **COVERED** piles after

General Pile Type		ONE wk	TWO wks	THREE wks	FOUR wks
Mostly Stems	Pile TOP	0.3 (<0.1%)	0.3 (<0.1%)	0.0 (0%)	0.0 (0%)
	Pile BTM	0.0 (0%)	1.0 (<0.1%)	0.3 (<0.1%)	0.0 (0%)
Mostly skins/seeds, few stems	Pile TOP	0.0 (0%)	0.2 (<0.1)	0.3 (<0.1)	0.0 (0%)
	Pile BTM	0.3 (<0.1%)	1.3 (0.1%)	1.2 (0.1%)	0.1 (<0.1%)

Rachises observed from the date they were removed from the piles until insects no longer found

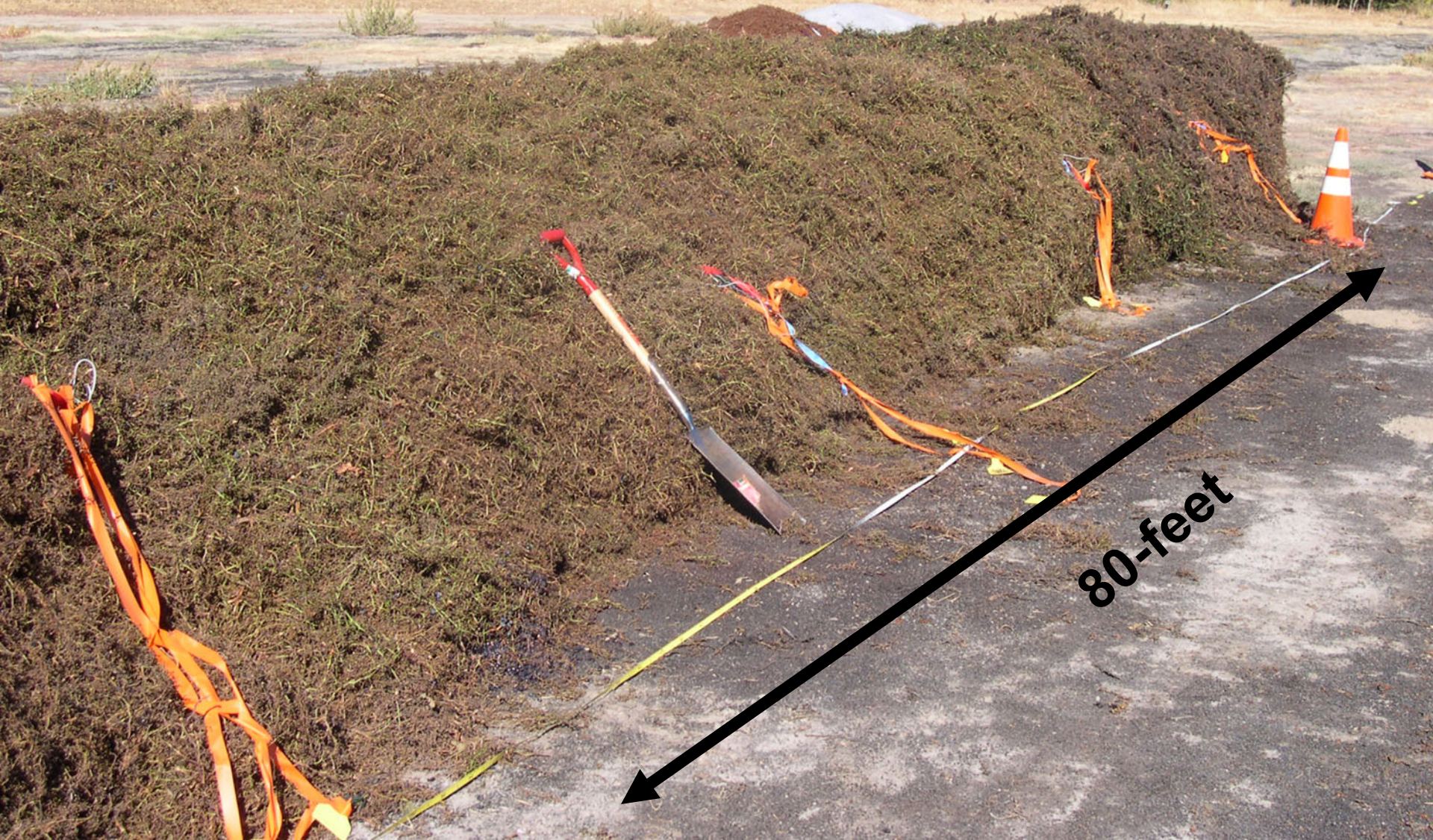
Conclusions

- It is possible for vine mealybugs to survive the winery's whole cluster press and be present on pomace.
- When pomace consists of mostly stems, and is not covered, one-third of the vine mealybug crawlers may survive after one week and over 10% may survive after 4 weeks.

Conclusions

- It is possible for vine mealybugs to survive the winery's whole cluster press and be present on discarded pomace.
- When pomace consists of mostly stems, and is not covered, one-third of the vine mealybug crawlers may survive after one week and over 10% survived after 4 weeks.
- When pomace consists of either skins & seeds or mostly stems, covering it with clear plastic for one week results in less than 0.1% survival of vine mealybug crawlers.

Survival of vine mealybug on in STEMS only



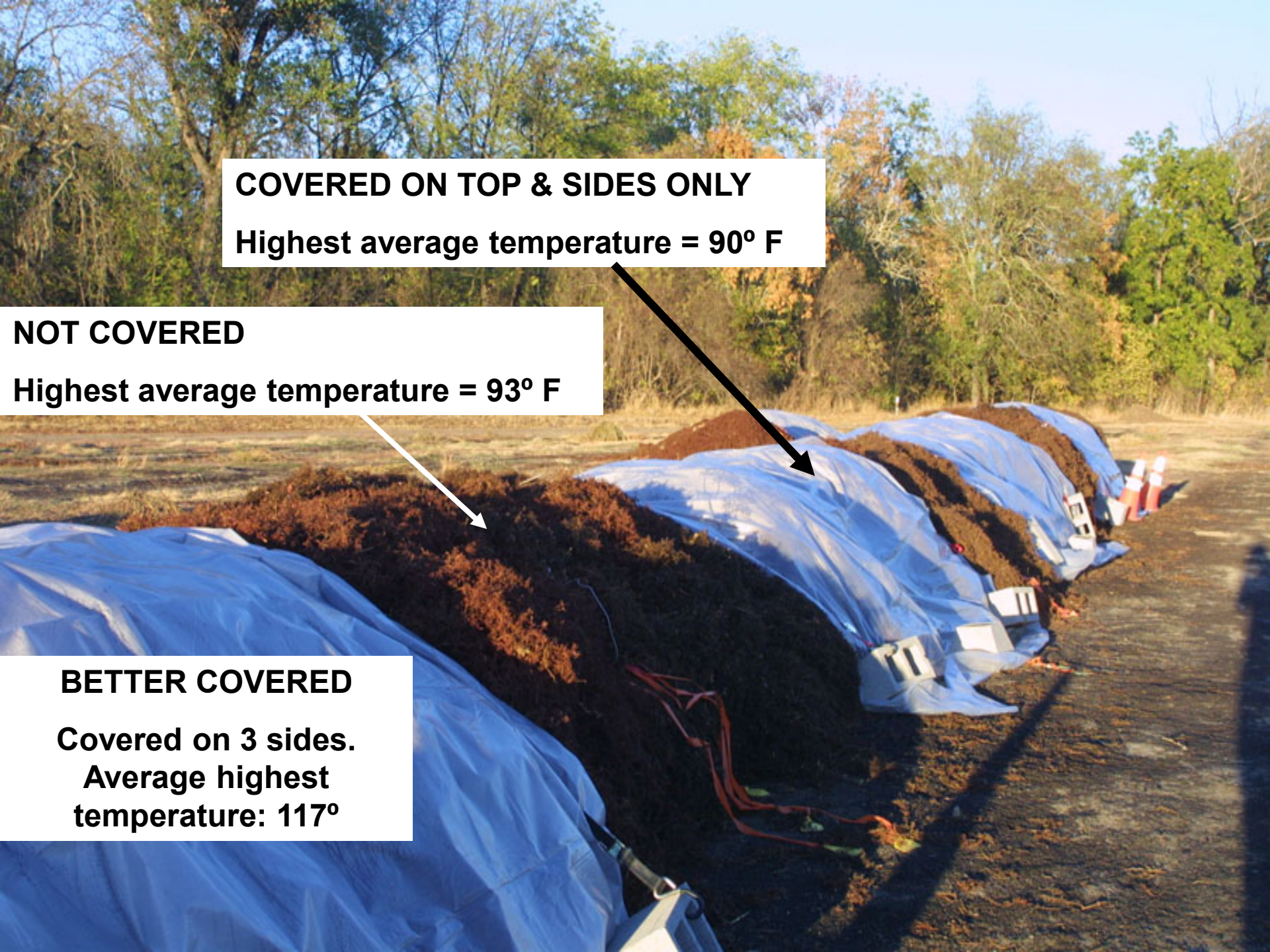
**Mesh bags containing
infested rachises were
placed in the center of the
windrow**



COVERED ON TOP & SIDES ONLY
Highest average temperature = 90° F

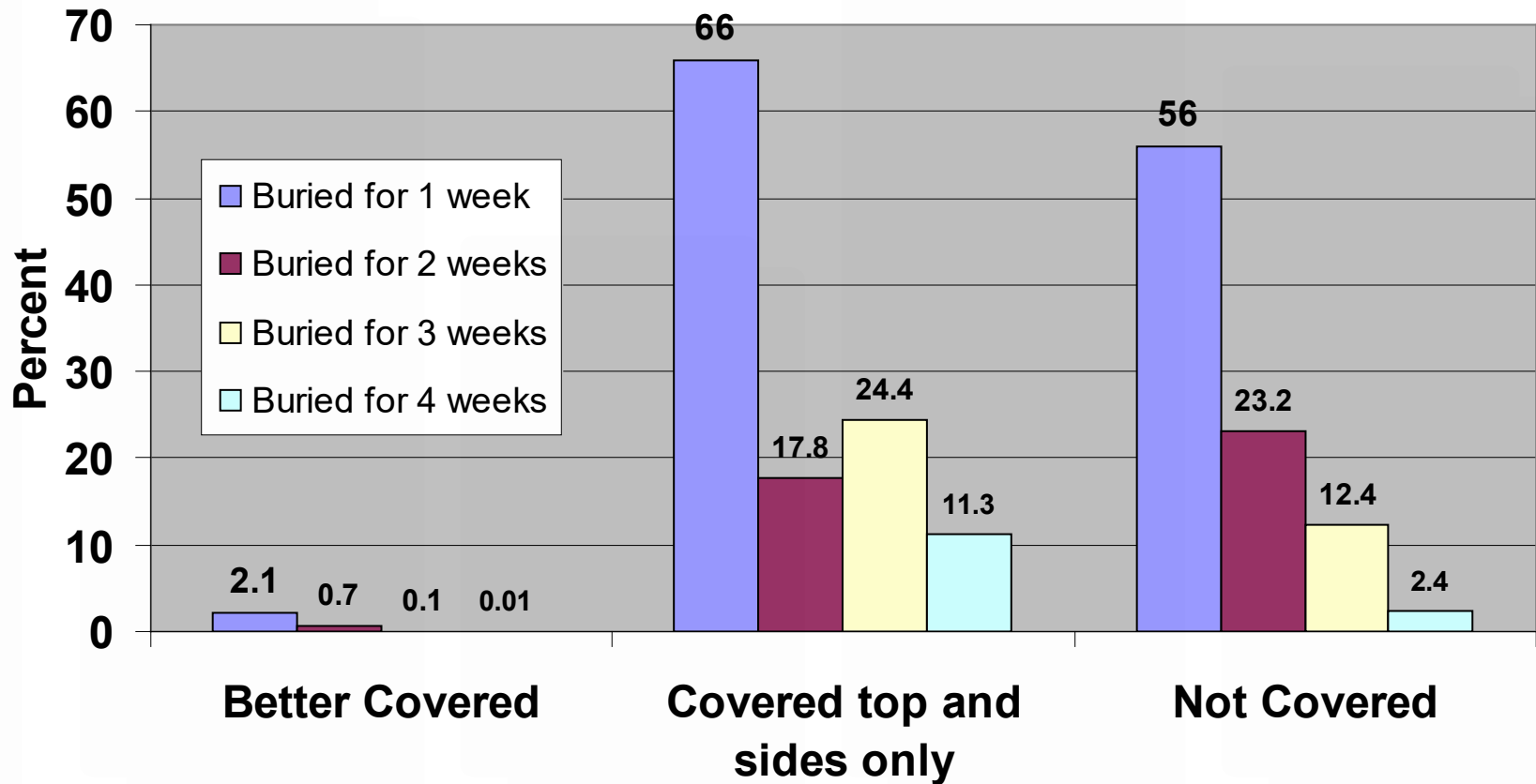
NOT COVERED
Highest average temperature = 93° F

BETTER COVERED
Covered on 3 sides.
Average highest temperature: 117°



Percent of insects that survived in the stem windrow as compared to controls

Buried rachises had an average of 1875 insects per rachis



Conclusions

- It is possible for vine mealybugs to survive the winery's whole cluster press and be present on discarded pomace.
- When pomace consists of mostly stems, and is not covered, one-third of the vine mealybug crawlers may survive after one week and over 10% survived after 4 weeks.
- When pomace consists of either skins & seeds or mostly stems, covering it with clear plastic for one week results in less than 0.1% survival of vine mealybug crawlers.
- When waste consists of stems-only, survival of vmb crawlers after one week can be as high as two thirds of the population that left the winery

Take Home Messages

- Cover ALL pomace piles very well and immediately
- Try to avoid making piles that are mostly stems
- Mix stem piles with skins and seeds if possible to increase temperature

