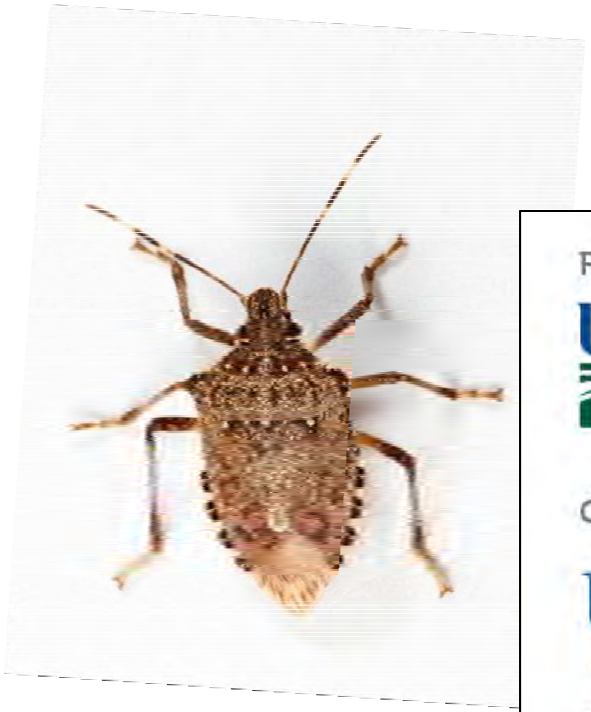
Grape Commodity Report



Funding

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Collaborating Institutions

University of Delaware

ars

Penn State

The State University of New Jersey Rutgers

Northeastern IPM Center

Washington State University

Cornell University

OSU Oregon State University

University of Maryland

Virginia Tech

NC State University

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BMSB in Vineyards and Wines

Biology, Ecology, and Management of Brown Marmorated Stink Bug in Orchard Crops, Small Fruit, Grapes, Vegetables, and Ornamentals USDA-NIFA SCRI Coordinated Agricultural Project

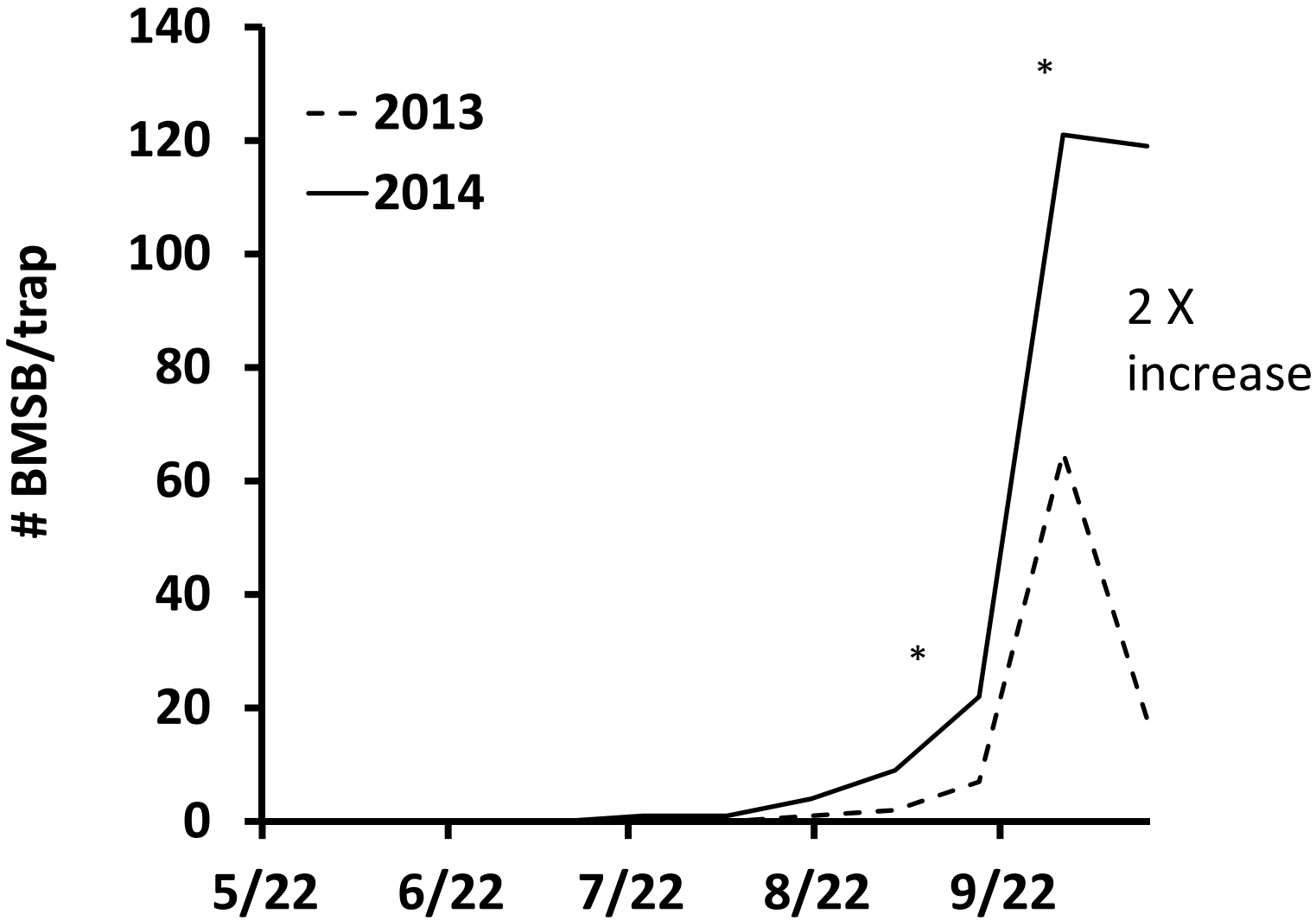
Grape Report 2014

- **Populations**
  - **Seasonality**
  - **Pheromone trapping**
- Injury
  - No-choice studies
- Interactions
- Taint

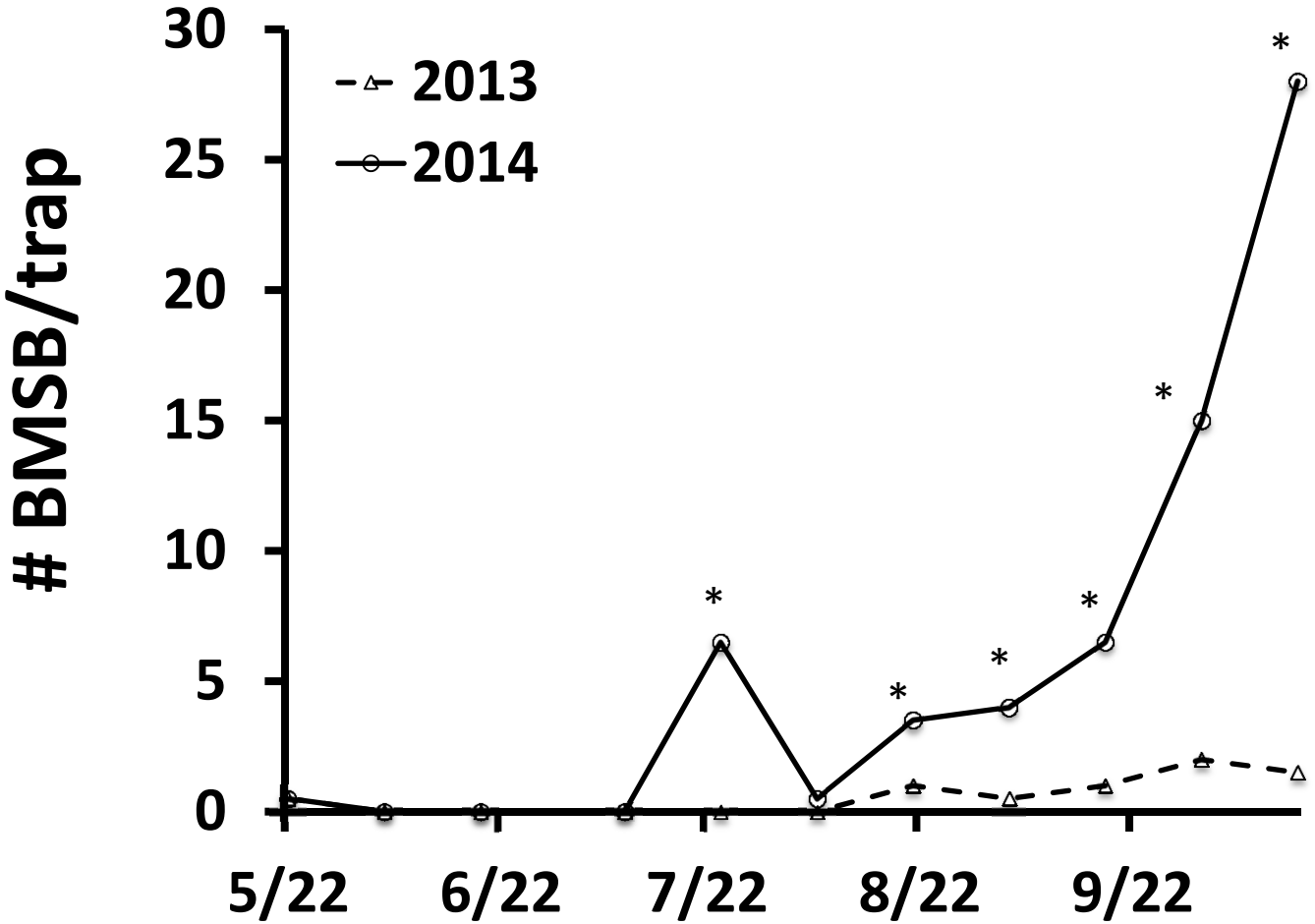
2014: BMSB In Commercial Willamette Valley

- Six vineyards (of which two were sampled in 2013)
- Pyramid traps placed on perimeter and within vineyard
- Do beat sheet sampling in 40 locations in every vineyard
- Sampled from May-October every 14 days.
- Data analyzed using ANOVA and Tukey's HSD to separate means

Vineyard # 1 close to Sherwood



Vineyard # 2 close to Newberg



18.6 X increase

Pheromone Effectiveness when trapping in low population densities of BMSB

- Erie county, PA has significantly lower populations of BMSB than locations as close as 45 miles to the south.
- Numbers are increasing yearly.
- Traps were placed in 10 locations, pheromone tests were conducted in 2 locations.
- Only two BMSB were caught each year in any of the traps.

BMSB on Concord Grapes

- BMSB fed a diet of concord grapes
- No differences in nutritional health, mortality or fecundity.
- Given a choice of food, Concord grapes are not a preference of BMSB in colonies.
- BMSB likely to be harvested with the mechanical pickers.

Hail

Grape Report 2014

- Populations
- **Injury**
- Interactions
- Taint

Edith Byrne

Peppercorn

Berry Touch

Early Veraison

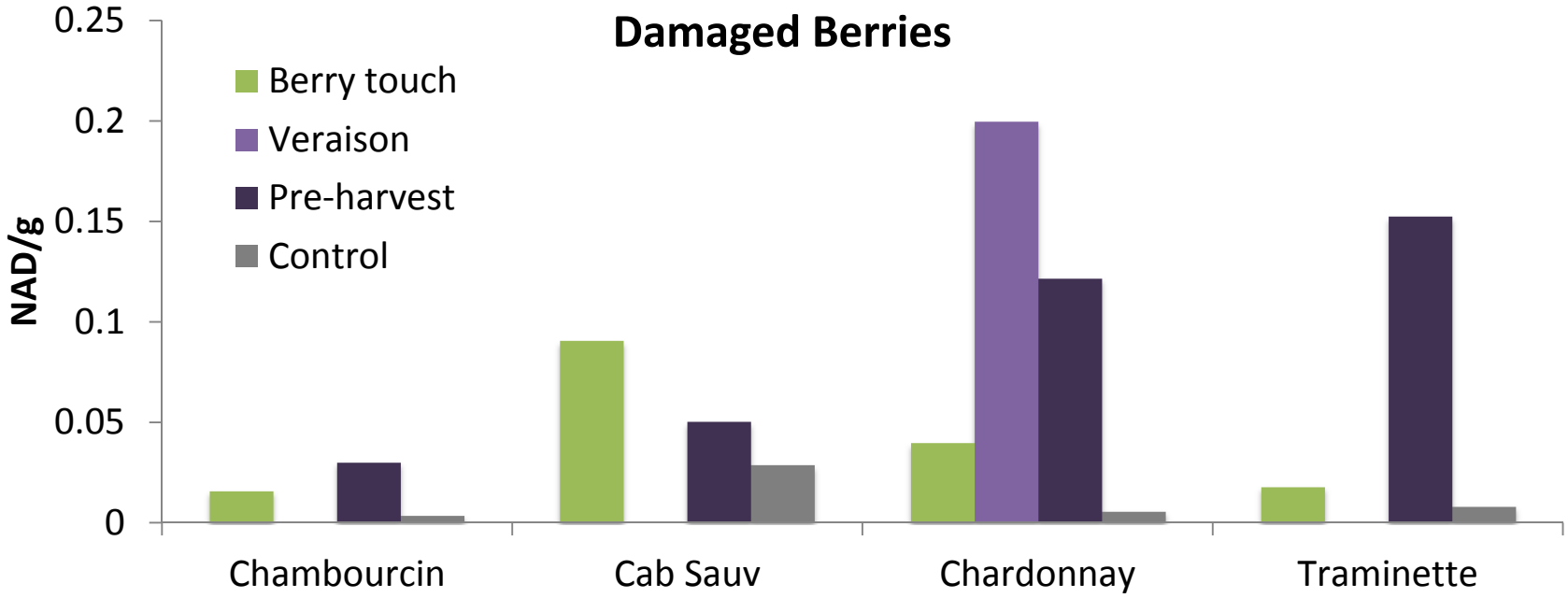
Late Veraison

Susceptibility - 7 Day Exposure

Variety	Pea	Touch	Veraison	Pre & harvest	Density	Adult/Nymph	State
Pinot Noir	✓		✓	✓	1, 2	Adult	OR
Chambourcin	✓	✓	✓	✓✓	**2**, 5, (10)	Adult Nymph	NJ
Chardonnay	✓	✓	✓	✓✓	**2**, 5, (10)	Adult Nymph	NJ
Traminette	✓	✓	✓	✓✓	**2**, 5, (10)	Adult Nymph	NJ
Cabernet Sauvignon	✓	✓	✓	✓✓	**2**, 5, (10)	Adult Nymph	NJ VA
Seyval Blanc	✓		✓	✓	4	Adult	VA

Phenology of Damage

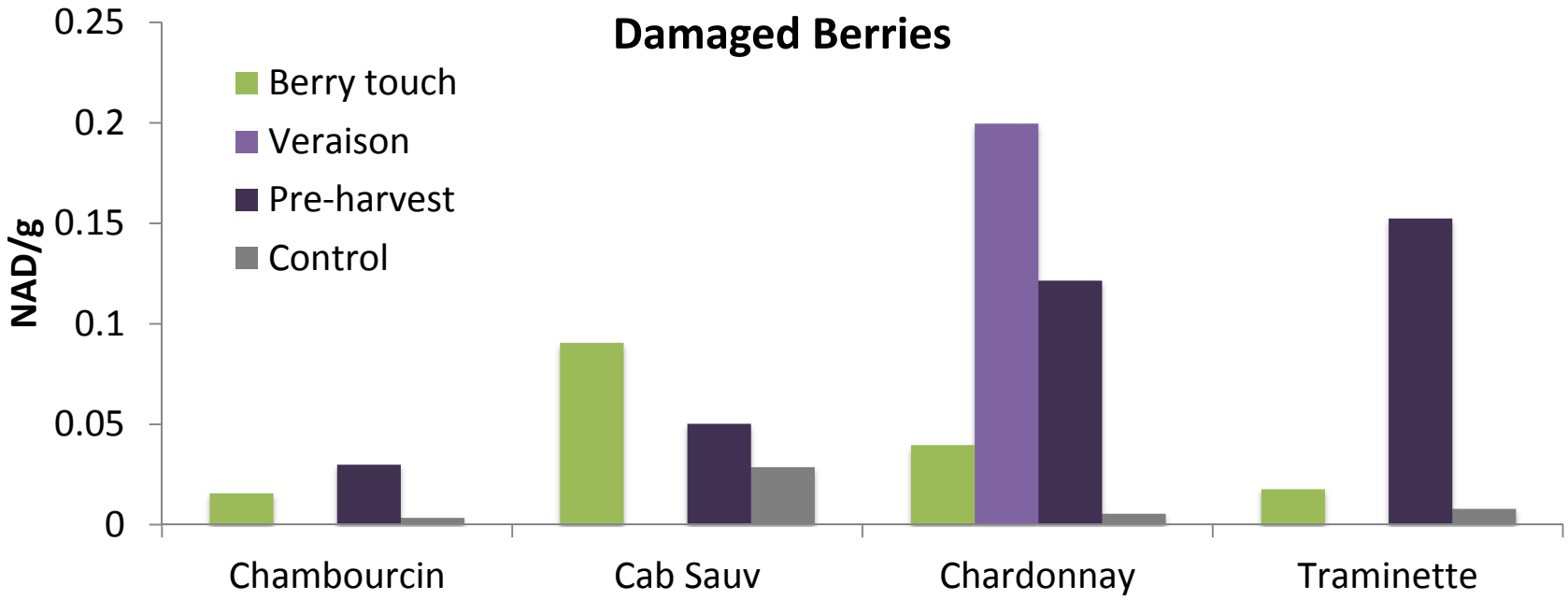
- Varieties:
  - Chardonnay
  - Chambourcin
  - Traminette
  - Cab Sauvignon
- Phenology:
  - Berry touch
  - Veraison
  - Pre-Harvest



Damage

Phenology of Damage

- Chardonnay
  - Impact on Brix at harvest
  - Significant sour rot (V, PH)
- Traminette
  - Sour rot at BT, PH



Determination of direct impact 2012-2013:

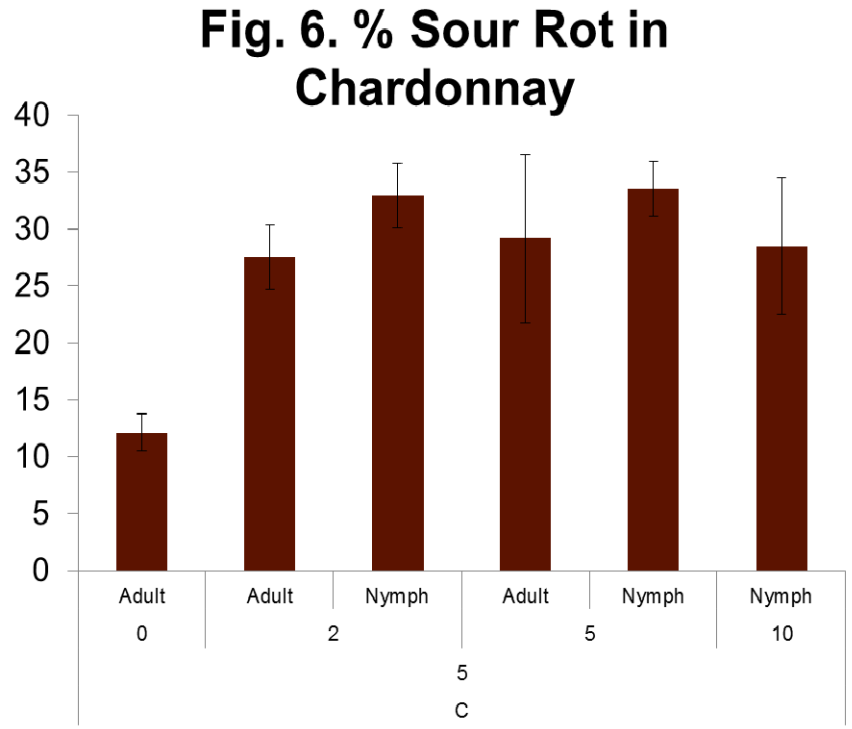
No measurable significant differences when looking at three key quality parameters

Grape Report 2014

- Populations
- Injury
- **Interactions**
- Taint

Sour Rot

- Controlled lab studies showed that BMSB could transfer sour rot pathogens to intact berries
- Field injury
  - Significant increase at veraison



BMSB ❤ SWD

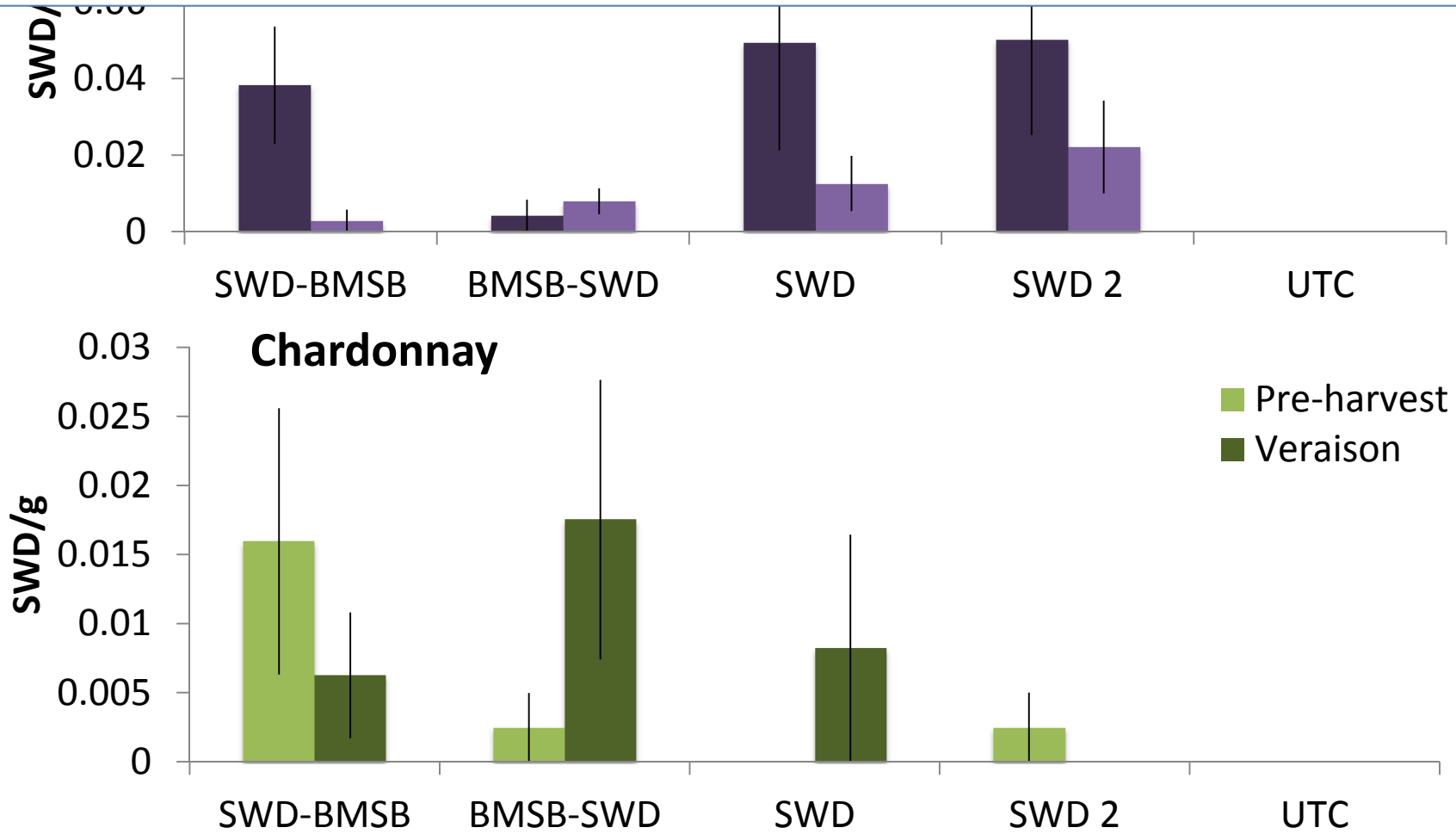
- Rutgers
  - Field experiments to identify interaction of SWD and BMSB
  - Investigated order of injury and result of SWD population
  - Veraison and pre-harvest timing

  - SWD only controls
  - BMSB only controls
  - SWD then BMSB
  - BMSB then SWD

RUTGERS UNIVERSITY

Field Trial

2013: Cab. Sauv. more susceptible to fly infestation when BMSB attacks after oviposition, associated with reduced berry weight



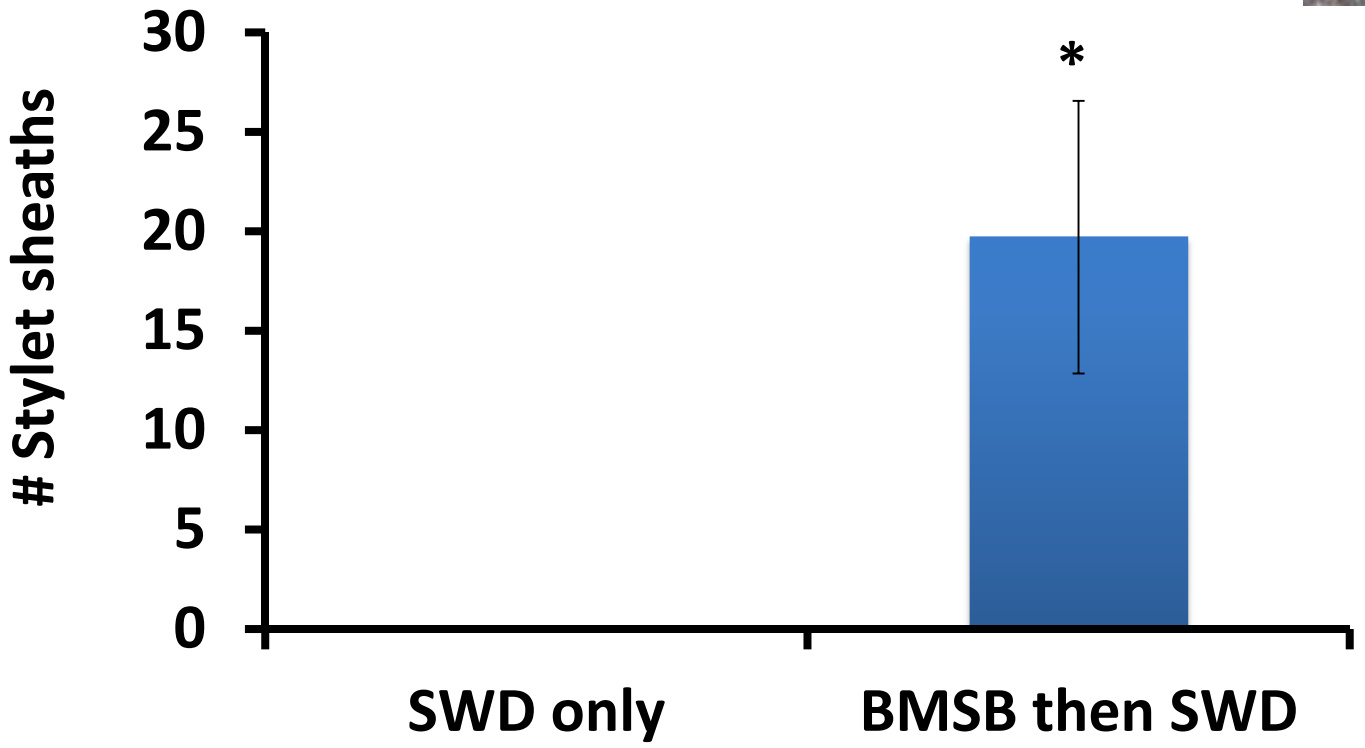
BMSB ❤ SWD

Oregon

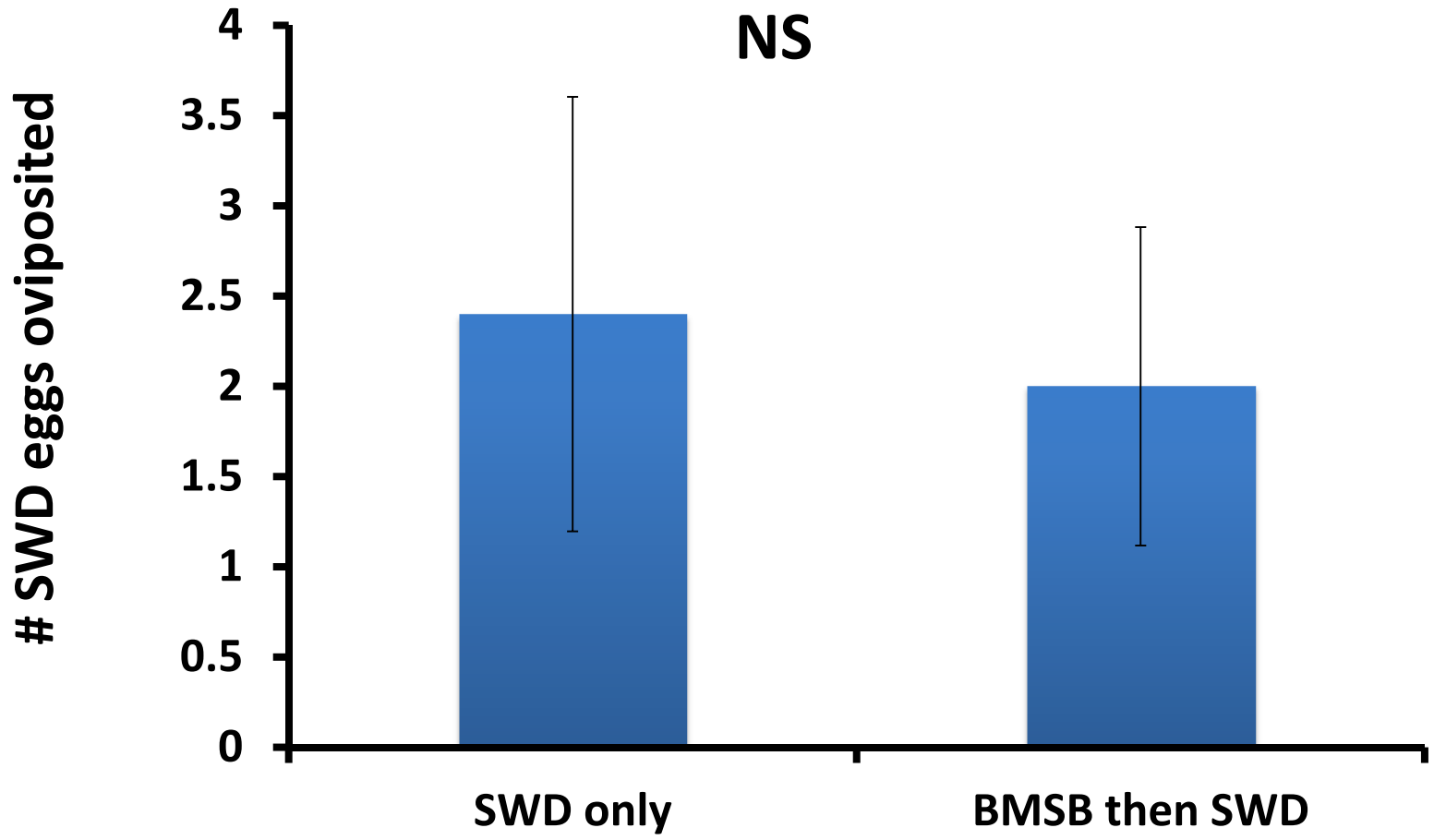
- Field study – several treatments (no trends found)
- Lab study
  - SWD only
  - BMSB then SWD

- Three intact berries replicated 10 times for each treatment
- Berries exposed to BMSB for 48 hours, then removed
- Berries subsequently exposed to SWD for 48 hours
- # stylet sheaths/berry
- # SWD eggs/berry
- Determine if eggs are laid in stylet sheath

Controlled BMSB and SWD interaction 2014

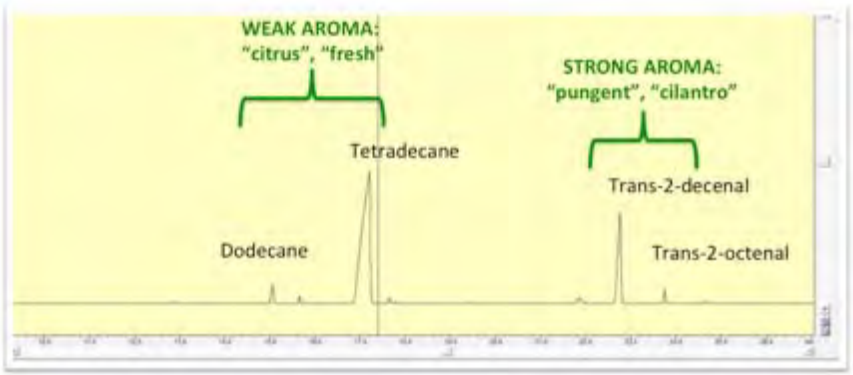


Controlled BMSB and SWD interaction 2014



Grape Report 2014

- Populations
- Injury
- Interactions
- **Taint**



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Sensory Panel Evaluation

A) Difference testing (triangle tests) showed that consumers could tell a difference between the treatment wines and the control (significant at $\alpha=0.05$).

B) Consumer rejection threshold found to be very close to the detection threshold, even even low amounts of BMSB taint have a negative impact on Pinot noir quality.

BMSB Taint in Concord Grape Juice

- Small batches of Concord grapes were hand processed with known numbers of BMSB added, starting with 1 BMSB/lug (approximately 35 lbs. of grapes).
- 10 BMSB/lug the majority of tasters could discern a taste difference in the raw juice.
- At the 25 BMSB/lug all of the tasters could detect a difference in taste.
- Pasteurized juice (HTST): Concentrations of BMSB/lug the tainted juice was correctly identified, by tasters, 66.7% of the time.

BMSB Taint in Concord Grape Juice

- Grapes were harvested and processed according to Welch's Corp. protocol by the Penn State Food Science Laboratory in October.
- Spiked sample (4, 8, 16, 24, 32 stinkbug/lug added sample) and non-spiked samples were bottled and stored.
- Sequential two-alternative forced choice (2AFC) preference tests.
- There was no significant preference at any of the levels tested and the control sample.
- In April, 2014, taste tests were repeated with the same tasters. No other significant preferences were noted.

BMSB in Wines: 2014 findings

- Populations low in mid-Atlantic
- Populations increasing in Pacific Northwest
- White varieties more susceptible to injury
- Interactions between pathogens and secondary pests
- BMSB in clusters at harvest can cause taint in wine but not juice