Pre to Post-Harvest Vineyard IPM

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NCWGA Pre-Harvest Workshop
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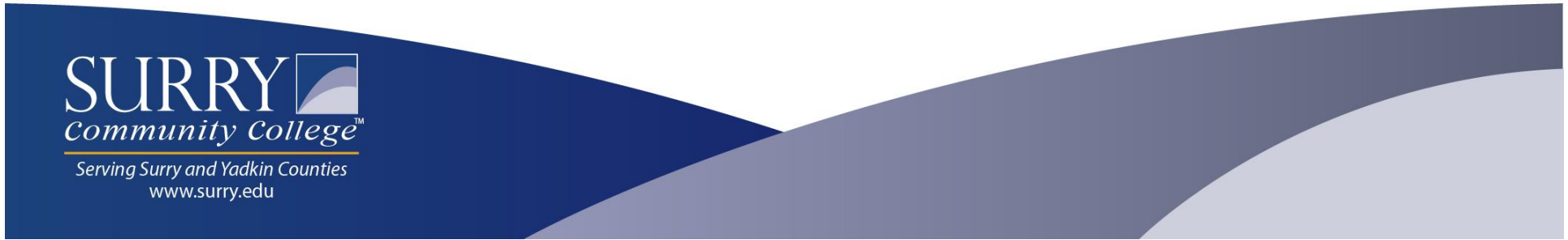


IPM Approaches and Tools

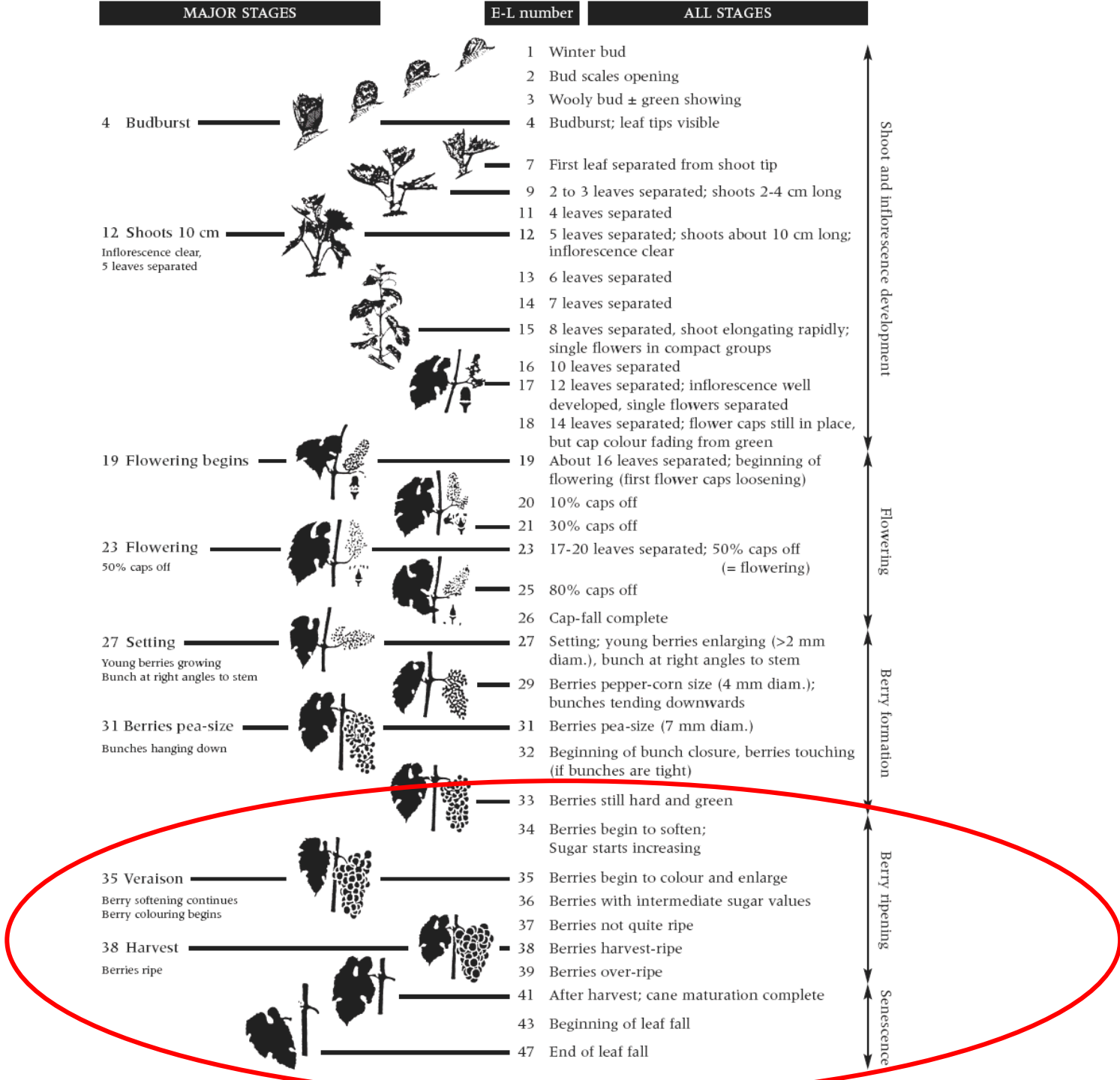
Cultural: alter environment, host plant, or behavior of pest

- Site selection
- Variety selection
- Canopy and crop load management
- Nutrient management
- Vineyard floor management
- Sanitation

Optimum Canopy Management

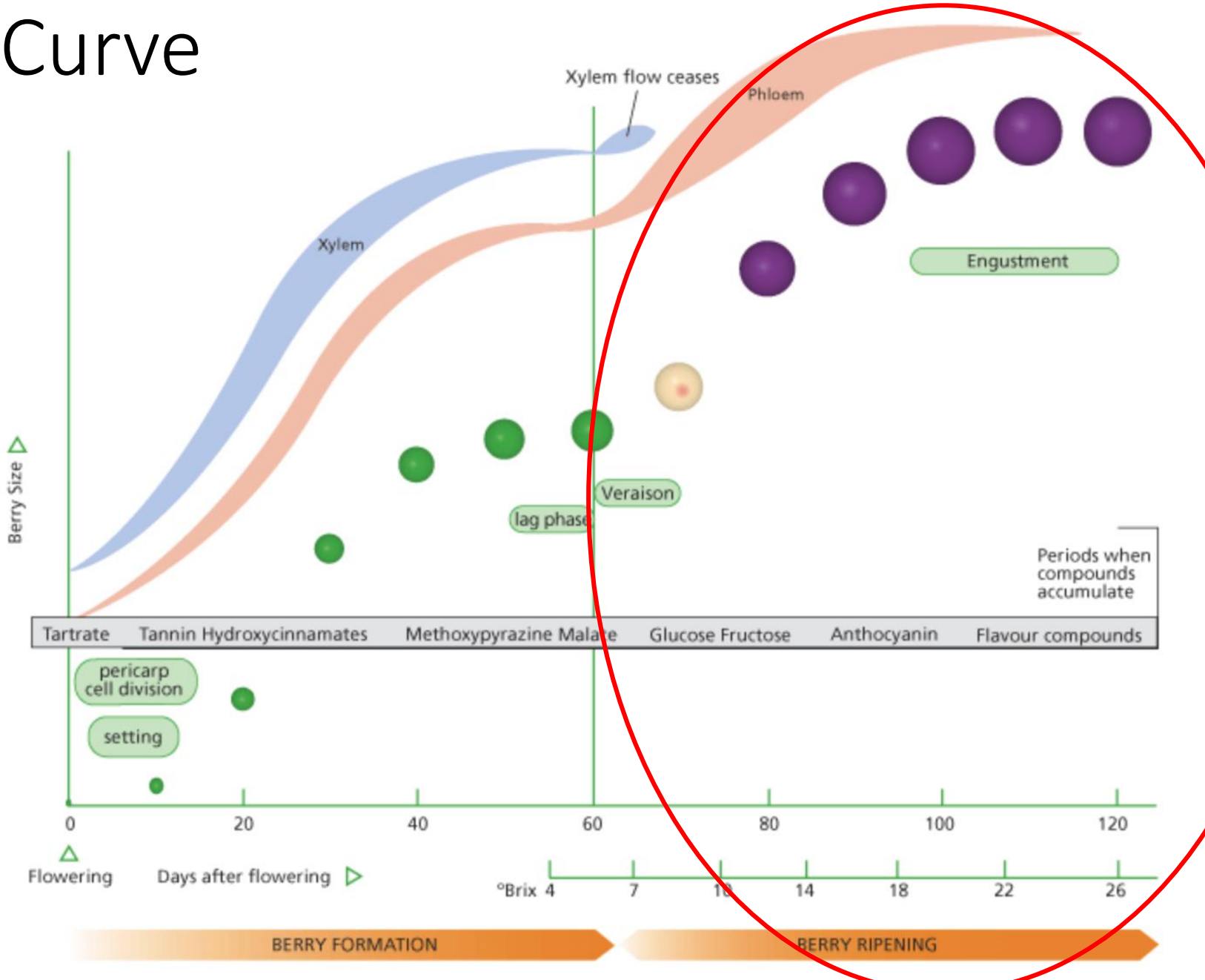
- <u>Balanced-crop: moderate shoot growth and optimum yield</u>
    - Canopy drying and spray penetration
    - Moderate acidity and low pH
    - Developed tannins
    - Good skin pigment development
    - Distinct varietal character
    - Good winter hardiness and bud fruitfulness

Eichhorn-Lorenz PhenologicalStages



Berry Growth Curve

- Double Sigmoid “S” Curve
- 3 Major Phases
  - 1.) Formation
  - 2.) Lag
  - 3.) Ripening



Post-Bloom

- Berries become resistant to black rot, powdery mildew and downy mildew about 6 weeks post-bloom
- Rachises, leaves and shoots must remain protected from black rot until about veraison
- Rachises, leaves and shoots must remain protected from powdery and downy mildew all season!

IPM Approaches and Tools

Chemical: synthesized, conventional pesticides

- Insecticides
- Miticides
- Nematicides
- Fumigants
- Fungicides
- Herbicides
- Rodenticides

IPM Approaches and Tools

Biological: use of beneficial organisms that feed on, parasitize, or compete with pests.

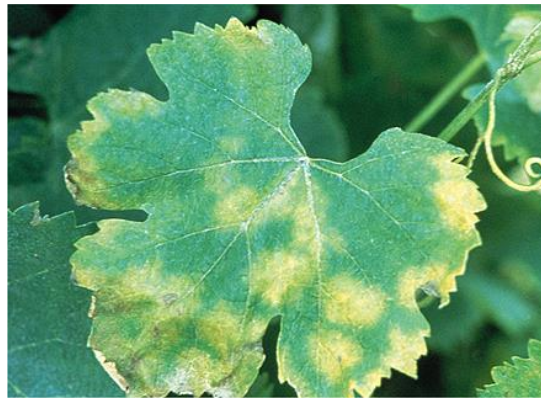
- Insects
- Fungi
- Bacteria
- Nematodes
- Cover crops
- Grazing animals

Biopesticides: natural materials, suppress but do not eliminate pest population

- Sex pheromones, microbial pesticides, plant-incorporated protectants

Downy Mildew

- Captan: watch your seasonal use limit, back off close to harvest
- Phosphorus Acid Products: not great for raging downy mildew
- Copper Products: back off close to harvest
  - We rotate with Cueva when there's a dry period and canopy still clean
- Watch your PHIs on Ranman and Ridomil products
- Remember Mancozeb has 66 day PHI
  - Post-harvest option if you haven't exceeded season use limit



Powdery Mildew

- Sulfur: back off close to harvest
  - Post-harvest option if temps between (80 – 65˚ F)
- 14 day PHI on many products that are labeled for powdery mildew
  - FRACs: 3,7,11, and FRAC 13 (Quintec) and FRAC: U13 (Gatten)
- When pressure is low and canopy is still clean we use the biologic Problad Verde (formerly Fracture) and product with powdery “suppression” (ie. Elevate) as both have short PHI.
- Potassium bicarbonate products (ex.: Kaligreen) are another option, but do not tank mix with phosphorus acid.
- Stylet Oil: don’t tank mix or use within 2 weeks of sulfur or captan.
  - Decent post-harvest option.

Botrytis

- Pre-bloom through fruit set peak window for infection that remains latent until ripening.
- Be especially diligent in tight cluster varieties
  - Use canopy management as a tool!
- Many products labeled for botrytis at high risk of resistance development, and documented resistance with many products
- Infections from veraison to harvest do not have latency period
  - Prevent wounds, scout often during ripening, careful with foliar N after veraison
- Watch your PHIs: many products labeled for botrytis are 7-14 day PHI

Other Fungal Fruit Infections

- Phomopsis and Black rot: managed with early season preventative sprays

- Bitter and Ripe rot: infections remain latent until ripening
  - Mancozeb, Captan, FRACs 11 and 12 have some efficacy

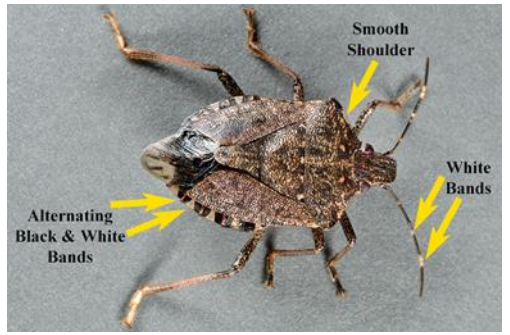
Sour Rot

- Critical to limit wounds: sunburn, Grape berry moth strikes, sunburn, etc.
- Antimicrobial products: (Oxidate, Serenade, Double Nickle, Problad Verde) are an option and have short PHI.
- Critical to control fruit flies that are a component of sour rot development

Insects

- Remember to rotate between IRAC codes, watch your PHIs and seasonal use limits. Be scouting for…
  - Multicolored Asian Lady Beetle
  - Brown Marmorated Stink Bug
  - Fruit Flies

- We have incorporated an organic product (Entrust, IRAC: 5) for fruit fly control. But fruit flies are much less problematic if wounds are prevented!



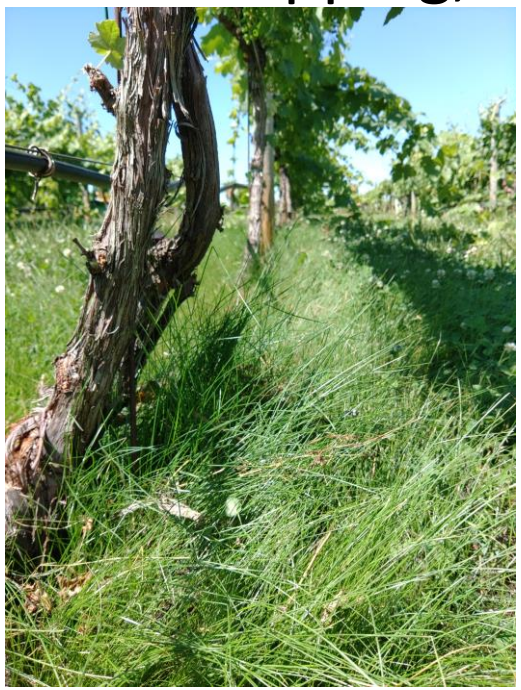
Birds and Mammals

- Vineyard site selection:
  - Consider this when you are in the site evaluation stage
  - Is there habitat in the immediate area?
    - Shelter, food, water
- Scare
  - Visual
  - Auditory
  - Predatory
- Repel
  - Smell/taste
- Exclude
  - Physical or electrical barrier
- Trapping and lethal
  - Baited trap
  - Take with firearm

Weeds

- Chemical: remember to rotate between HRAC codes and watch your PHIs and seasonal use limits.

- Non-chemical options: in a portion of the vineyard we use cover cropping, mowing, and mechanical disturbance with suckering machine.



Systemic Diseases

- Pierce's Disease: scouting from veraison to harvest
  - Our protocol: vines with four PD symptoms (leaf scorch, matchstick petioles, green islands, shriveled fruit) are marked, decapitated and removed during dormant season.

- Leaf roll and Red blotch viruses: scouting from veraison to harvest
  - So far our vines that are showing symptoms of virus have been confirmed positive for red blotch and are limited to one block of one variety; therefore, virus does not appear to be spreading via vector, and likely came from infected nursery stock.

Other News…

- Chlorpyrifos were banned in February 2022
  - We have been successfully managing Grape root borer with pheromone disruption for 4 years.
- Captan is under review…possible label changes in future
- Spotted lanternfly has established population in Forsyth county
  - Grapes are one of their favorite host plants

Harvest

- Harvest time dependent on
  - Intended wine style
  - Chemistry
  - Aromas and flavors
  - Phenolic development
- Weather
- Labor
- Disease pressure, mainly bunch rots!
  - Botrytis
  - Sour rot
  - Ripe rot
  - Bitter rot!
- Depredation pressure
  - Birds
  - Mammals
- Post-harvest critical fungicide sprays to reduce overwintering inoculum
  - Powdery Mildew
  - Downy Mildew

Thank you for your attention!

Questions?