

Insect & Vertebrate Control:

Maintaining berry integrity throughout the season

Advanced Viticulture Short Course
Webinar - May 20, 2020



TEXAS A&M
AGRILIFE
EXTENSION

VITICULTURE
ENOLOGY

FRAN PONTASCH
GULF COAST VITICULTURE
FMPONTASCH@TAMU.EDU

Significant Insects that Threaten Berry Integrity

GBM Larva



GBM Adult



Grape Berry Moth

Larvae feed on developing berries



***Drosophila spp.* fruit fly**

Contributor to Sour Rot Complex

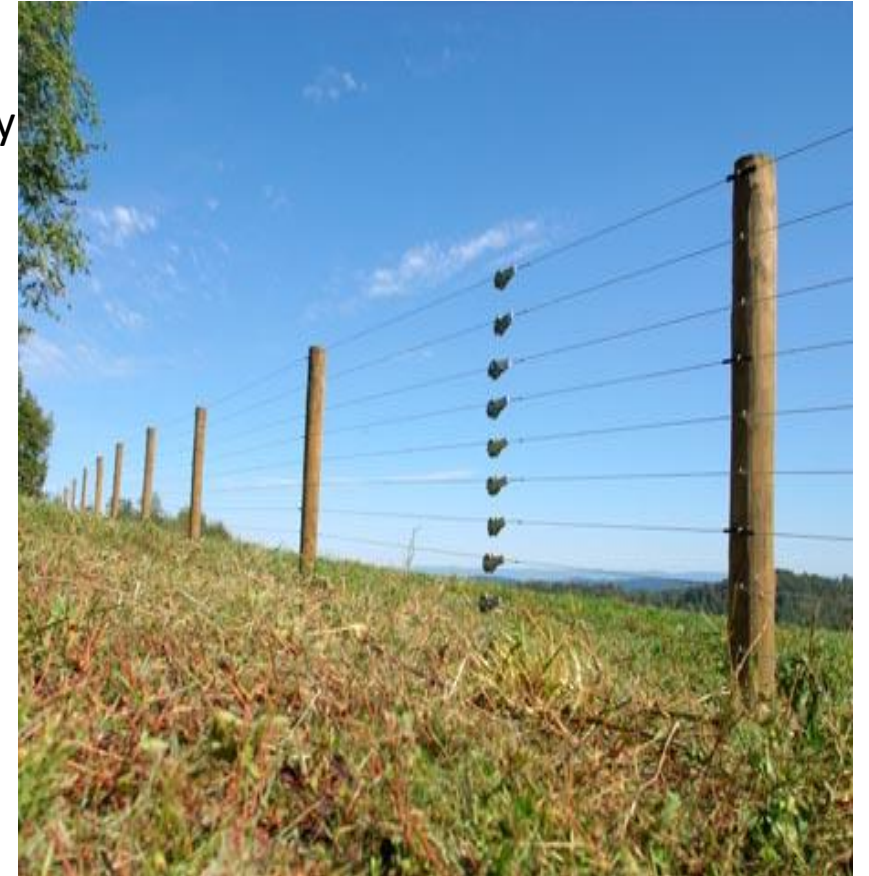
Best controlled Integrating Pest Management

Raccoons



Trapping –
Inspect traps daily
Relocate far from vineyard
Raccoons can become trap shy

Electrified perimeter fence



Birds





Picked Clean



Raggedy berry pieces

Bird Abatement for Vineyards

No 1 system has proved effective.

- Netting
- Scare Systems
- Predatory Birds
- Lasers
- Repellants

Use a combination of systems
Change system up during ripening

Bird Netting

Most effective bird deterrent
Varies in weave and strength



Scare Systems

AUDITORY

Bird Digital recordings of local bird predators & local birds in distress

Propane Cannon



VISUAL

Kites

Mylar Tape

Owls

Scarecrows



Repellent

Methyl Anthranilate (MA):

- Methyl ester of anthranilic acid
- FDA “substance generally considered safe” as a flavoring agent
- Applied as spray
- Deters birds by sight, smell, and color with some formulations Irritates bird mucous



Rapture birds

- Falcons, hawks, owls
- Intimidate & scare nuisance birds
- Effective & natural
- Hired falconers most effective



Lasers

- Deterrent & repellant
- Permanently mounted



Sour Rot Complex

A complex of late-season bunch rots

Develops when *Drosophila* spp. are present.



Begins with injured berry

Most commonly:

- After late season rains
- In tight-clustered varieties
- When berry separates from pedicel, causing berry skins to split
- Under dense canopies with heavy foliage blocking the fruit zone.



Dynamic Trio Partnership in Infection

1. Yeast – begins to ferment berry juice producing ethanol
2. Acetic Acid Bacteria – converts ethanol to acetic acid
3. Drosophila fruit flies – contribute to the breakdown of the berries

ALL 3 MUST BE PRESENT



Dynamic Trio in Control

Insecticides targeting *Drosophila* fruit flies significantly reduced sour rot severity. zeta-cypermethrin (Sevin) or Spinetoram

Combine antimicrobial sprays + insecticide - even better

Managing canopy + antimicrobial sprays + insecticide = best results

Begin spraying when berries reach 15°Brix, before symptom onset
Repeat weekly until harvest

Grape Berry Moth

Paralobesia viteana



Grape Berry Moth Life Cycle

- Overwinter in leaf debris
- Lay eggs on flowers & new berries
- Eggs hatch within 5-10 days
- Larvae burrow into developing berries to feed
- 4-5 generations per year

Grape Berry Moth Detection

Scout for webbing in flowering clusters

Traps up before bloom

Replace pheromone monthly

Inspect traps weekly



Grape Berry Moth



Integrated Management of Berry Integrity

- Manage Canopy Density
Manage Air Flow - *reduce humidity*
- Maintain a Clean Vineyard - *disturb insect habitat*
Burn or remove vine debris
Keep weed free vine rows
Mow before heads go to seed

Nuisance Larvae

Moth larvae – Lepidopteran Control



Grape Leaf folder



Grape Skeletonizer



Tomato Hornworm



Sphinx moth

Insecticides – Caterpillar & Moth Specific Lepidopteran Control

IRAC
Group

18 **Mode of Action:** hormone disruptor methoxyfenozide

Intrepid 2F

Some residual effect

Manage resistance by rotating
chemical sprays

Insecticides – Caterpillar & Moth Specific Lepidopteran Control

IRAC
Group

5 Caterpillar & Moth – Lepidopteran Control Biologics

Entrust	spinosad
Delegate	spinetoram
DiPel	<i>Bacillus thuringiensis var. kurstaki</i>

Taint the Fruit

Sphinx moth caterpillar



Stink Bugs



Green June Beetle



Stink Bugs

Eggs Hatch Mid May



Photos Courtesy of Paul Darst

Grasshoppers-*Melanoplus differentialis*



Green June Beetle

Cotinus nitida





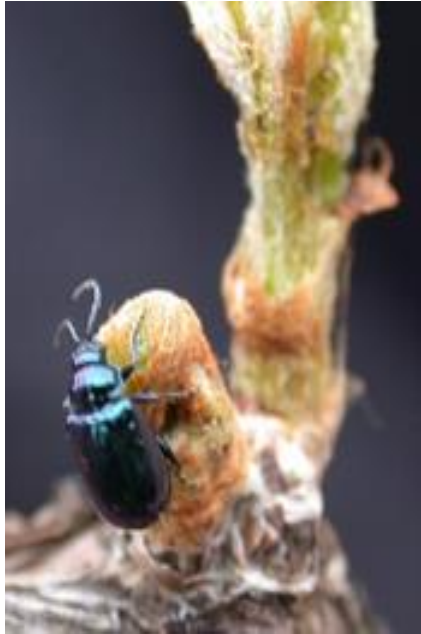
Green June Beetle

Cotinus boylei



Photo: Jim Rummage

Secondary Insects to Grapevines



Flea Beetle

Korynetes caeruleus



Aerial Phylloxera

Daktulosphaira vitifoliae



Leaf Cutter Ant

Common Insect Pests of Grapes in Texas and Common Insecticides

Blocks with an X indicate that the product is labeled for the corresponding insect.

Insecticide – common name, trade name	Grape Berry Moth	Grape Cane Borer	Grape Flea Beetle	Grape <u>Leaffolder</u>	Green June Beetle	Leafhopper/ Sharpshooter	Mealybugs	<u>IRAC</u>^a
<u>acetamiprid</u> (Assail 30SG)	X					X	X	4A
<u>carbaryl</u> (Sevin XLR)	X		X	X	X	X		1A
<u>dinotefuran</u> (Venom)	X					X	X	4A
<u>finpropathrin</u> (Danitol 2.4EC) ^b	X		X	X		X		3
imidacloprid (Admire Pro, Montana 2F) ^c						X	X	4A
malathion (Malathion 5 EC)						X	X	1B
<u>methoxyfenozide</u> (Intrepid 2F)	X			X				18
<u>phosmet</u> (Imidan 70-W)	X	X	X			X	X	1B
<u>spinetoram</u> (Delegate WG)	X			X				5
<u>spinosad</u> (Entrust SC)	X			X				5
<u>s-cyanomethyl cis/trans-2,2 dimethylcyclopropane carboxylate</u> (Mustang Max) ^b	X					X		3
<u>spirotetramat</u> (Movento)							X	23

^aTo prevent insect resistance to one chemical mode of action, avoid successive applications of insecticides with the same IRAC codes.

^bRestricted use pesticide.

^cMay be applied through chemigation systems.

General Insecticide

IRAC
Group

1A Carbaryl attacks nervous system & can be toxic on contact

Sharpshooters, GBM, GJB, Flea Beetle, Leafroller,
Stinkbug, Flea beetle, Grasshopper, *Drosophila* fruit fly

Kills on contact, no residual, inexpensive, not so effective

Group 4 – Nicotinic acetylcholine receptor ANTAGONISTS

Attack the nervous system

Many insects

4A Neonicotinoids

Imidacloprid generics, Admire Pro

Dinotefuran Venom

Acetamiprid Assail

4D Flupyradifurone

Flupyradifurone Sivanto Prime, Sivanto HL

Group 4 – Nicotinic acetylcholine receptor ANTAGONISTS

REQUIRES Resistance Management –

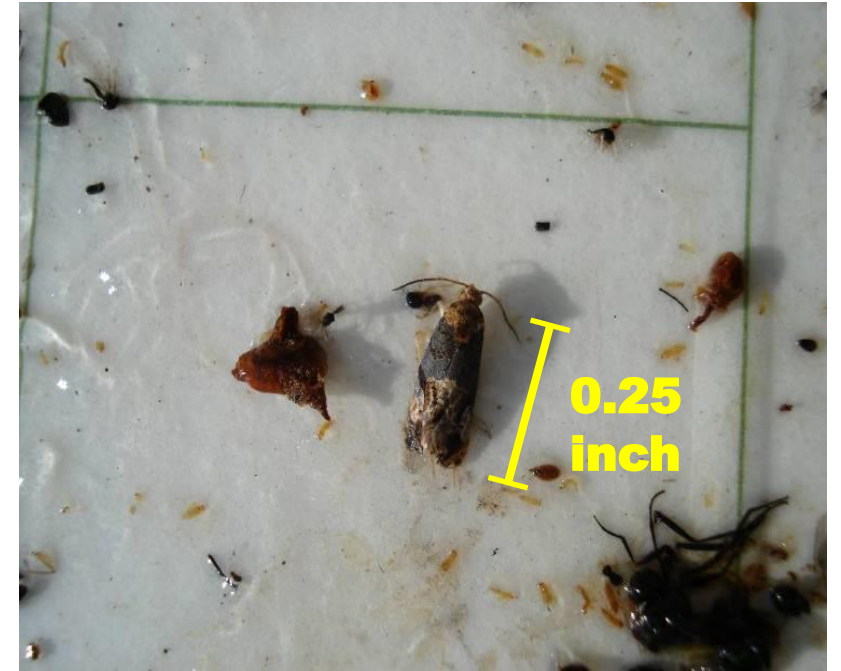
Do not make more than 2 applications per season.

- ☐ Through drip irrigation for systemic action through the root system
- ☐ Foliar spray to kill on contact – NO residual benefits

Time insecticide applications according to emergence.



Glassy Winged Sharpshooter



Grape Berry Moth

Factors that Contribute to Damage by Insects

Environmental

- Heat & Drought
- Wind damage
- Cold and frost injury
- Hail Damage

Cultivation Practices

- Nutritional disorders
- Chemical misapplications
- Faulty irrigation

ASIAN GIANT HORNET

“Murder Hornet”

NOT identified in Texas

*As of May 2020, no ASH
have been found outside
Of Washington state.*



Sphecus sp.
cicada killer



Spheg ichneumoneus
great golden digger wasp



Vespa crabro
European hornet
(does not occur in WA)



Cimbex americana
elm sawfly



Vespa mandarinia
Asian giant hornet



Vespula pensylvanica
western yellowjacket



Polistes dominula
European paper wasp



Apis mellifera
western honey bee



Dolichovespula maculata
bald-faced hornet



Tremex columba
pigeon tremex



Bombus flavifrons
yellow head bumble bee

Wasps, Hornets, & Bees
that resemble the ASH

Asian Giant Hornet, Look-alikes 101
Xanthe Shirley
USDA APHIS May, 2020

SUMMARY

Manage Canopy Air Flow

Maintain a Clean Vineyard

Determine Economic Threshold

Monitor Emergence

Time Insecticides that Target the
Stage

-

