NEW AND OLD PEST THREATS TO THE VITICULTURE INDUSTRY

UNIVERSITY OF NEBRASKA VITICULTURE PROGRAM WORKSHOP OCTOBER 19, 2019

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NEW PEST THREATS – SPOTTED LANTERNFLY

- Native to China
- First detection – Berks County Pennsylvania 9.2014
- Other detections
  - Virginia
  - New Jersey
  - Delaware
  - Maryland
  - New York and Massachusetts (single dead specimen)
- Grapevines, tree fruits and trees at risk

Adult Spotted Lanternfly Photo credit: Holly Raguza, Pennsylvania Department of Agriculture

Immature Spotted Lanternfly Photo credit: itchydogimages

SURVEY OF VIRUSES OF GRAPES IN MISSOURI

- 400 leaf samples collected in July 2017
  - Sample 4 vines; 4 leaves per vine, 2 leaves per cordon, 1 basal leaf and exterior leaf.
  - Samples processed in September 2017 at UC Davis
  - 35% of samples positive for GRBV
- 56 soil samples collected in July
  - 14 samples (25%) contain Dagger (*Xiphinema americanum X. index)* nematode

RESULTS OF SURVEY OF VIRUSES OF GRAPES IN MISSOURI

- 362/400 (91%) of samples had one virus
- 261/400 (65%) of samples had two or more viruses
- Grapevine Stem Pitting associated virus most prevalent (59%)
- Grapevine Leaf Roll associated virus 3 second most prevalent (53%)
- Grapevine Red Blotch associated virus was third most prevalent (35%)

OBSERVATIONS OF SURVEY OF VIRUSES OF GRAPES IN MISSOURI

- Visual symptoms were not apparent on any cultivars sampled during follow up visits except;
  - Crimson cabernet (GRBaV)
  - Chardonel (GVCV)
  - Vidal blanc (ToRSV

GRAPEVINE RED BLOTCH ASSOCIATED VIRUS

FLEETING SYMPTOMOLOGY OF GRAPEVINE RED BLOTCH ASSOCIATED VIRUS

- No symptoms apparent up to 9.27.17
- Symptoms on 10.25.17
- Killing frost on 10.28.2017
- Similar in 2018 with symptoms apparent on 10.16. 18 and killing frost on 10.19.18

GRBAV IS WIDELY DISTRIBUTED IN GRAPEVINE CULTIVARS THROUGHOUT MO

- GRBaV found in 16 of 26 grape hybrids
- Symptoms characteristic of the virus have not been observed in grape hybrids in Missouri
- Norton is asymptomatic
- We do not know if GRBaV have any effect on grape quality

GRAPEVINE VEIN CLEARING VIRUS

Cultivar	Response to GVCV
Chambourcin	Resistant
Norton	Resistant
Traminette	Tolerant
Cayuga White	Tolerant
Vidal Blanc	Susceptible
Chardonel	Susceptible
Valvin muscat	Susceptible

GRAPEVINE VEIN CLEARING VIRUS

Wenping Qui Center for Grapevine Biotechnology.
W. H. Darr College of Agriculture. Missouri State University

TOMATO RINGSPOT VIRUS

Cultivar	Vines	Infected			
		ToRSV	RRSV	PRMV	ArMV
	No.				
Vidal blanc	28	28	0	0	28
Seyval	26	26	0	0	0
St. Vincent	46	42	0	0	39
Norton	30	20	0	0	20
Catawba	30	30	0	0	2

- Vines did not display symptoms
- Suggested that cultivars are tolerant to ToRSV, ArMV, GLRaV-3 & GFkV
- *Xiphinema americanum* found in all five vineyards sampled

NEPO VIRUSES IN MISSOURI

Milkus, B.N. 2001. Incidence of four Nepo viruses in Missouri vineyards. Am J. Enol. Vitic. 52:56-57.

Vineyard	Cultivar	ToRSV	Symptomatic
		%[1]	+/-[2]
1	Chardonel	0	-
2	Chardonel	0	-
3	Vidal blanc	100	+
4	Vidal blanc	100	+
5	Vidal blanc	0	_
6	Vidal blanc	100	+
7	Rayon d'Or	0	-

[1]Percentage based on five vine sample.
[2]+ represents clusters displayed symptoms, whereas – represents clusters were normal.

REAL-TIME PCR FAILED WHEREAS ELISA PROVIDED RESULTS MATCHING SYMPTOMOLOGY

PHENOXY HERBICIDES

- Xtend dicamba + glyphosate
- Enlist 2,4-D + glyphosate

- https://fieldwatch.com/neighbors/

GROWING GOOD NEIGHBORS

THE BASIC PESTS

Diseases

- Phomopsis
- Black Rot
- Downy mildew
- Powdery mildew
- Anthracnose
- Late Season Rots

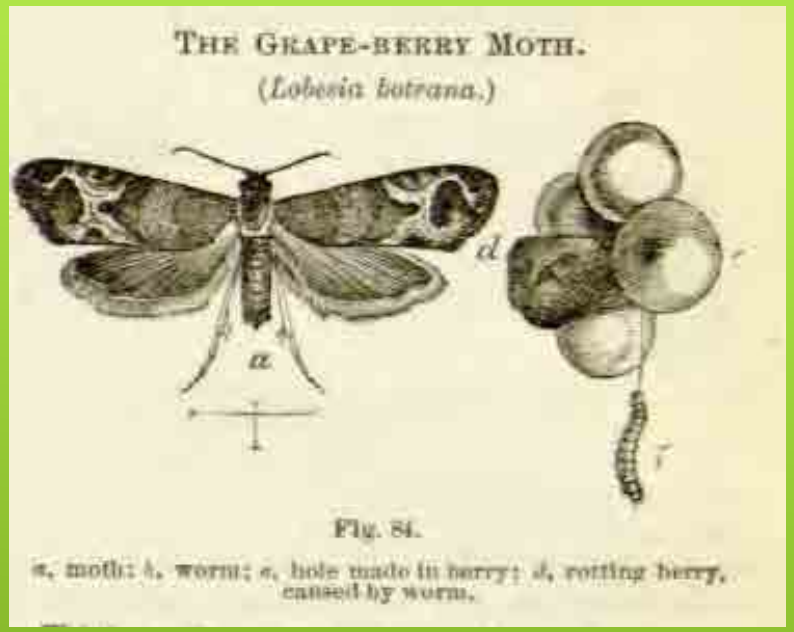
Insect Pests

- Japanese beetles
- Grape berry moth

Trunk Diseases

Other Pests

- Birds
- Deer
- Rodents



PHOMOPSIS

- Needs moist plant tissue for infection
- Susceptible period; bud break to bloom
- Infections at bloom become latent
- Prune out infected canes
- ½ to 1” tissue at budbreak needs protection

- Needs moist plant tissue for infection
- Berries highly susceptible to infection first two weeks after bloom
- Berries develop resistance 5 to 6 weeks after bloom
- Prune out mummy berries
- Immediate pre-bloom and post bloom cover sprays are important

BLACK ROT

DOWNY MILDEW

- Needs moist plant tissue for infection
- All green tissue susceptible
- Berries become resistant 4 to 5 weeks after bloom
- Overwinters on infected leaves

POWDERY MILDEW

- Plant tissue moisture not needed for infection
- Infections develop within shaded canopy
- Inflorescence susceptible immediate pre-bloom then berries susceptible after fruit set
- Berries become resistant 2 to 4 weeks after bloom
- Overwinters as cleistothecia on trunks, cordons and spurs

ANTHRACNOSE

- Needs moist plant tissue for infection (prolonged wet and 70 to 80 °F
- Highly susceptible cultivars include;Vidal blanc, Marquette, Frontenac, La Crescent and Swenson cultivars – Edelweiss, Espirit, Brianna, St. Pepin and Swenson white
- Mancozeb, captan, ziram

BITTER ROT

- Needs moist tissue for infection (6-12 hours),72 to 77° F
- Infection period from bloom to harvest
- Early infections latent until veraison
- Often misdiagnosed as black rot
- Anecdotally bitter rot increasing

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