I THOUGHT I KNEW EVERYTHING ABOUT GRAPE GROWING UNTIL THE NEXT GROWING SEASON CAME: WHAT THE VINES CAN TELL YOU

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- When I Visit:
  - What you share is held in confidence. I am not there to judge you!
  - Many times you hold the information from the past that can solve the problem
  - If you don't wear shirts with pockets …start now
  - Working together we can find solutions

PATIENT CLIENT PRIVILEGE CONUNDRUM

QUESTIONS TYPICALLY ASKED BY MD

- What brings you in today? (Something is wrong with my grape plants)
- What hurts? (My livelihood if this can’t be remedied)
- What are your symptoms? (Spots on leaves)
- How long has this been going on? (About a week)
- Has the pain been getting worse? (The spots are increasing)
- Do you smoke? Do you take any recreational drugs? Do you drink alcohol and how often? (I will not ask these questions)

QUESTIONS TYPICALLY ASKED BY MD

- Do you have a family history of this? (Have you had these symptoms other years?)
- Do you take any medicines or supplements? (What have you sprayed, when, how much. What fertilizers have you applied, when, how much)
- Are you sexually active? (The grapevines are hermaphroditic)
- Have you had any previous surgeries? (What other problems have you dealt with in the past)
- Does it hurt when I push here? (Fortunately grapes wine when pressed)
- Are you allergic to any medicines? (Did you spray something your vines don't like?)

"More and mor patients are go i n g to the Internet for medi,eal advice. To keep my practice ,g o i n g, I chattged my name to Dr. Google."

Plant Chart

- Cultivar
- Age
- Site history
  - Previous crops
  - Management history
  - Current management practices
- Spray application records
- Management ofsurrounding fields
- Weather information

ASKING THE RIGHT QUESTIONS?

ABIOTIC PLANT DAMAGE

- Mechanical
  - Abrasions and breakage
- Environmental
  - Temperature, light, moisture, wind
- Chemical
  - Fertilizer, pesticides, Ozone

BIOTIC PLANT DAMAGE

- Pests
  - Insects, mites, rodents, deer, and humans
- Pathogens
  - Fungi, bacteria, viruses

SYSTEMATIC APPROACH TO ID

- Look for patterns
- Lo cation of damage: young leaves, older leaves, shoot, canes, petioles, penduncle , rachis, berries
- Radiation/spread of problem – confined to a block a cultivar

FUNGAL ID CHARACTERISTICS

- Leaf spots – not consistent pattern on leaves
  - Chlorotic –yellowing
  - Necrotic - browning
- Shoot spots
- Fruiting bodies

BACTERIAL ID CHARACTERISTICS

- Sometimes form leaf spots, mosaic patterns, or pustules on leaves and fruits
- Fruit rots – Acetobacter
- Galls –crown gall

VIRAL ID CHARACTERISTICS

- Often inhibit chlorophyll formation resulting in mottling, stunting, distortion, yellowing and vine dieback
- Grapevine vein clearing virus (GVCV)
- Grapevine fanleaf virus (GFLV)
- Over 70 virus or virus -like agents

- Often see symptoms and not pest itself!
  - Ragged or chewed leaves
  - Rolled leaves
  - Tunnels in leaves
  - Holes in shoots, trunks, and berries

INSECT ID CHARACTERISTICS

ABIOTIC ID CHARACTERISTICS

- Mechanical – weed trimmers
- Physical – environmental extremes
- Drought/Flooding
- Chemicals
- Nutrient deficiencies

- Often observe damage and not rodent itself

- Voles – trunk damage
- Birds – berry damage
- Raccoons – berry and vine damage
- Management – exclusion

RODENT ID CHARACTERISTICS

Symptoms

- Cracked/split fruit
- Necrotic fruit
- Leaf tatters
- Disease absent on leaves and shoots

CASE EXAMPLE 1

Symptoms

- Necrotic leaves and shoots near ground
- Above ground shoots no showing symptoms
- Early season
- Herbicides not applied

CASE EXAMPLE 2

Symptoms

- Chlorotic spots
- Newly established vines
- Symptoms absent on new growth
- Weeds appear controlled

CASE EXAMPLE 3

Symptoms

- Necrotic leaf lesions
- Bronzing from leaf lesions

CASE EXAMPLE 4

Symptoms

- Necrotic leaf lesions
- Bronzing from leaf lesions

CASE EXAMPLE 4 CONT.

Symptoms

- Necrotic leaf lesions
- Bronzing from leaf lesions

CASE EXAMPLE 4 CONT.

CASE EXAMPLE 4 CONT.

Symptoms

- Necrotic pith and vascular system
- Damage confined to area in a vineyard block

Symptoms

- What is most striking to you in this vineyard?

CASE EXAMPLE 5

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Symptoms

- Berry/Flower abortion
- Fingering on leaves

CASE EXAMPLE 5 CONT.

Symptoms

- Vines chlorotic
- Confined to an area in vineyard block

CASE EXAMPLE 6

CASE EXAMPLE 6 CONT.

Results from Leaf Samples

Analysis[1]	Result
2,4-D	0.010 PPM
Clopyralid	ND[2]
Dicamba	ND
MCPA	ND
Picloram	ND
Mesotrione	0.70 PPB

[1]SGS North America, Brookings SD.
[2]ND represents not detected.

Symptoms

- Cultivar – Norton
- Defoliated quickly around mid to late June
- Leaves had botrytis and phomopsis
- Bleached spur covered with pycnidia

CASE 7

Symptoms

- Cultivar – Norton
- Defoliated quickly around mid to late June
- Leaves had botrytis and phomopsis
- Bleached spur covered with pycnidia

CASE 7 CONT.

CASE 8

CASE 9

CASE 10

CASE 11

CASE 12

- Every growing season presents a different challenge
- These seldom are predictable
- Better not to worry instead focus first on what you know

"JUST ONE MORE THING"
-COLUMBO

- Downy mildew
- Black rot
- Grape Berry Moth
- Foliar phylloxera

FOR MORE THAN 150 YEARS

THE BASIC PESTS

Diseases

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

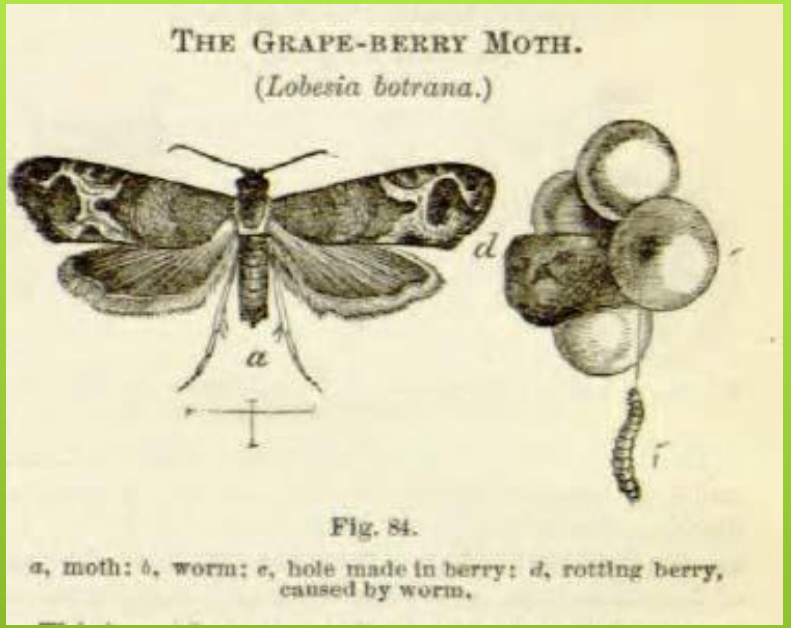
Insect Pests

- 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

- 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

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

BITTER ROT