Trunk Diseases in Grapes

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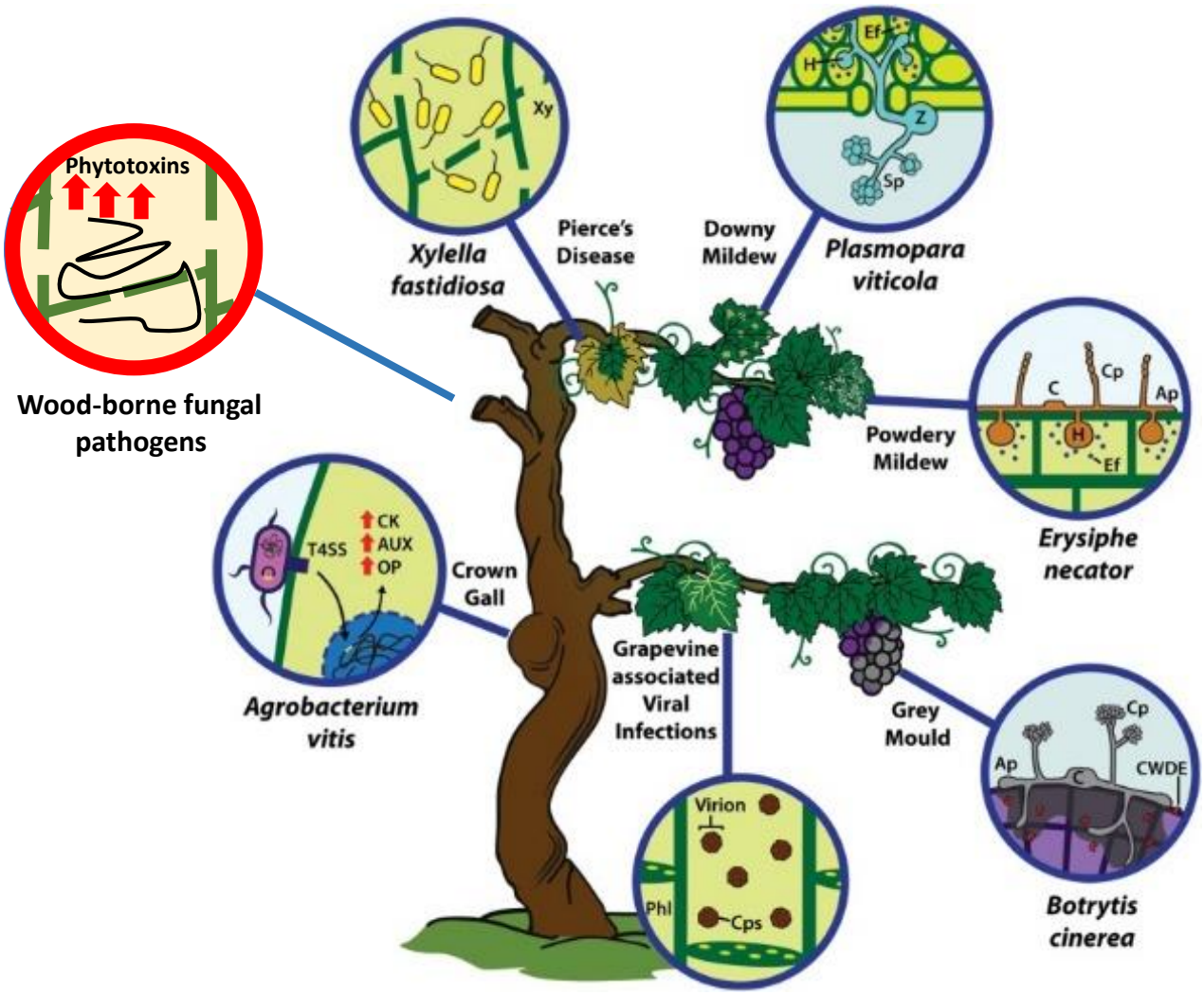
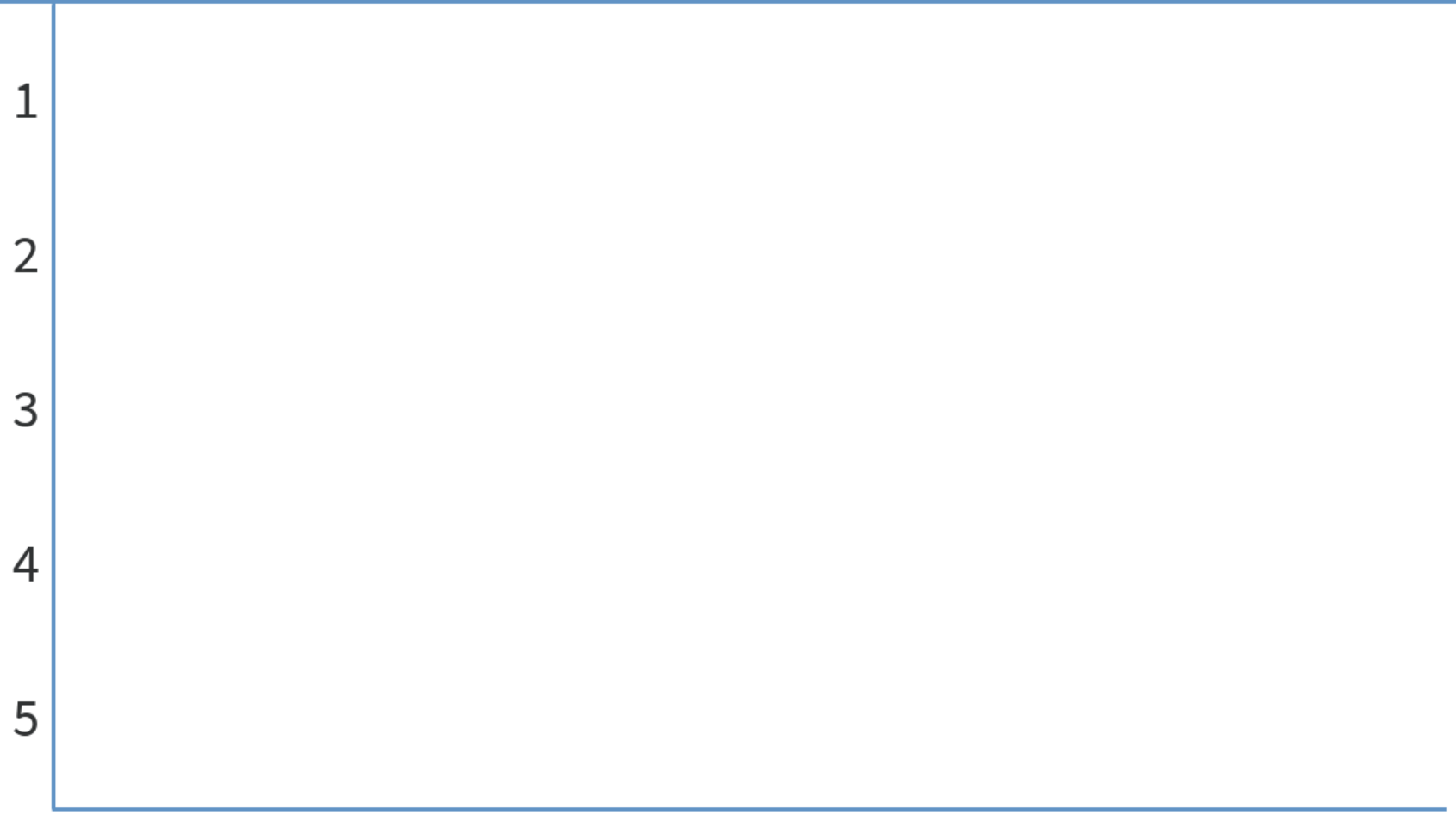


Armijo et al. (2016): Grapevine Pathogenic Microorganisms: Understanding Infection Strategies and Host Response Scenarios. Front. Plant Sci. 2016, 7:382.

Grapevine Trunk Diseases (GTDs)

Biology and Complexity of GTDs.
Identification of GTDs.
Damage Potential of GTDs.
Prevention and Management of GTDs.

SCALE: 1 (most important) - 5 (not important): How important are trunk diseases to you?



	Trunk Diseases
Type of Pathogen	Fungal
Lethal to vine	Yes
Plant Age	Mature; young (ESCA)
Resistance/Tolerance	Not found
Can come with nursery stock?	Yes
Transmitted?	Open wounds, Rain, Pruning Tools
Systemic	No
Severity in NC	?

GTDs = Complex Diseases

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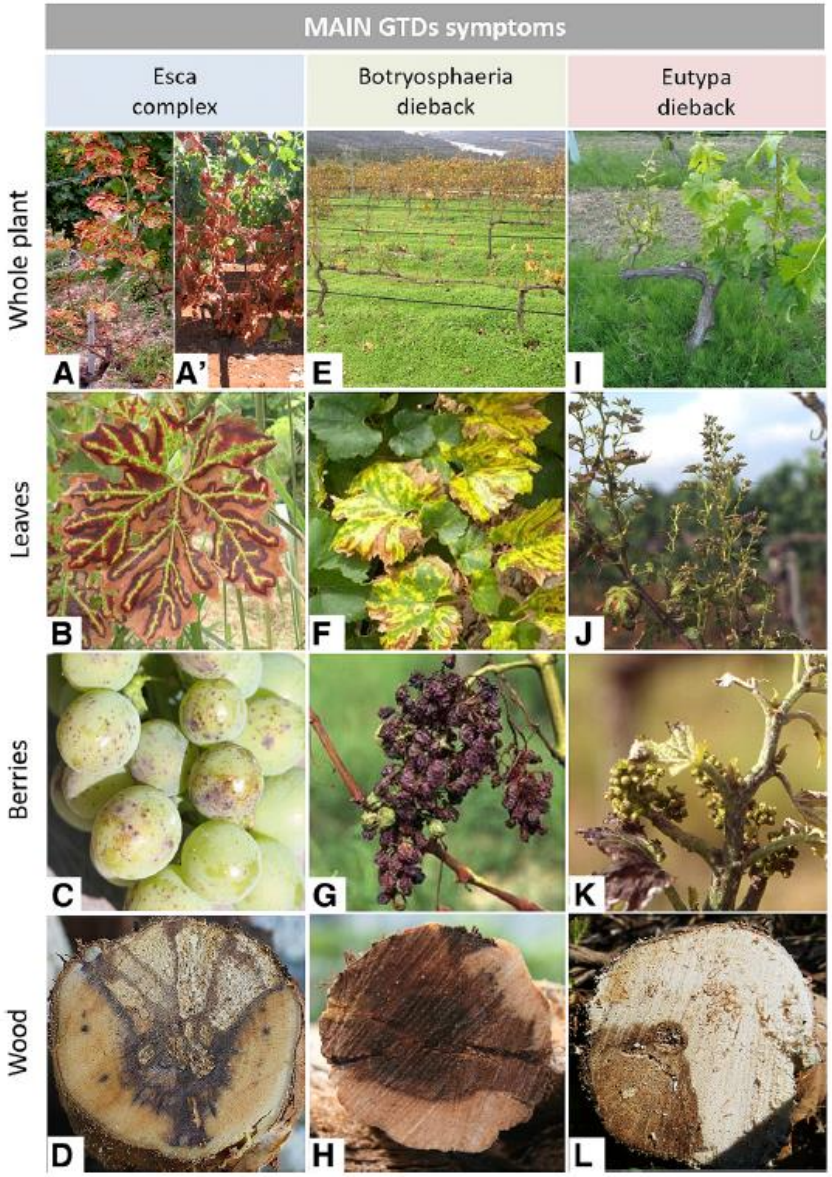
- Eutypa Dieback
- Esca Disease Complex (‘Petri Disease’)
- Botryosphaeria Dieback



Mondello et al. (2018): Grapevine trunk diseases: A review of fifteen years of trials for their control with chemicals and biocontrol agents. Plant Disease 102:1189-1217.

Grapevine Trunk Diseases
Eutypa Dieback

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- Main organism: *Eutypa lata*
- *Other organisms described in association with Eutypa Dieback*
- Common in areas with more than **10 Inches of rainfall/year (Yadkinville: 45 Inches/year; Hendersonville: 55 Inches/year)**
- Often associated with stunted growth and dead arms

Grapevine Trunk Diseases
Bortyospheria Dieback

- **21 different species of *Bortyopsphaeia***

Many other fungi as well.

- Wood Symptoms
- Sudden death
- Apoplexy!

Grapevine Trunk Diseases
ESCA Disease Complex

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- Main organisms: *Phaeomoniella chlamydospora (PC); Phaeoacromonium aleophilum (PA);*
- *Many other fungi are described in association ESCA*
- PC spore liberation → linked to rainfall; PA spore liberation → not linked to rainfall

Grapevine Trunk Diseases
ESCA Disease Complex

- *Brown Wood Streaking*
- *Petri Disease*
- *Young Esca*
- *Esca (Leafstipe)*
- *Esca Proper*

- Wood Symptoms
- Sudden death
- Stunned growth, leaf chlorosis
- Black Measels
- Tiger Stripes
- Apoplexy!

Grapevine Trunk Diseases
ESCA Disease Complex

Mondello et al. (2018): Grapevine trunk diseases: A review of fifteen years of trials for their control with chemicals and biocontrol agents. Plant Disease 102:1189-1217.

Bertsch et al. (2013): Grapevine trunk diseases: complex and still poorly understood. Plant Pathology 62,243-265.

Grapevine Trunk Diseases
Effects

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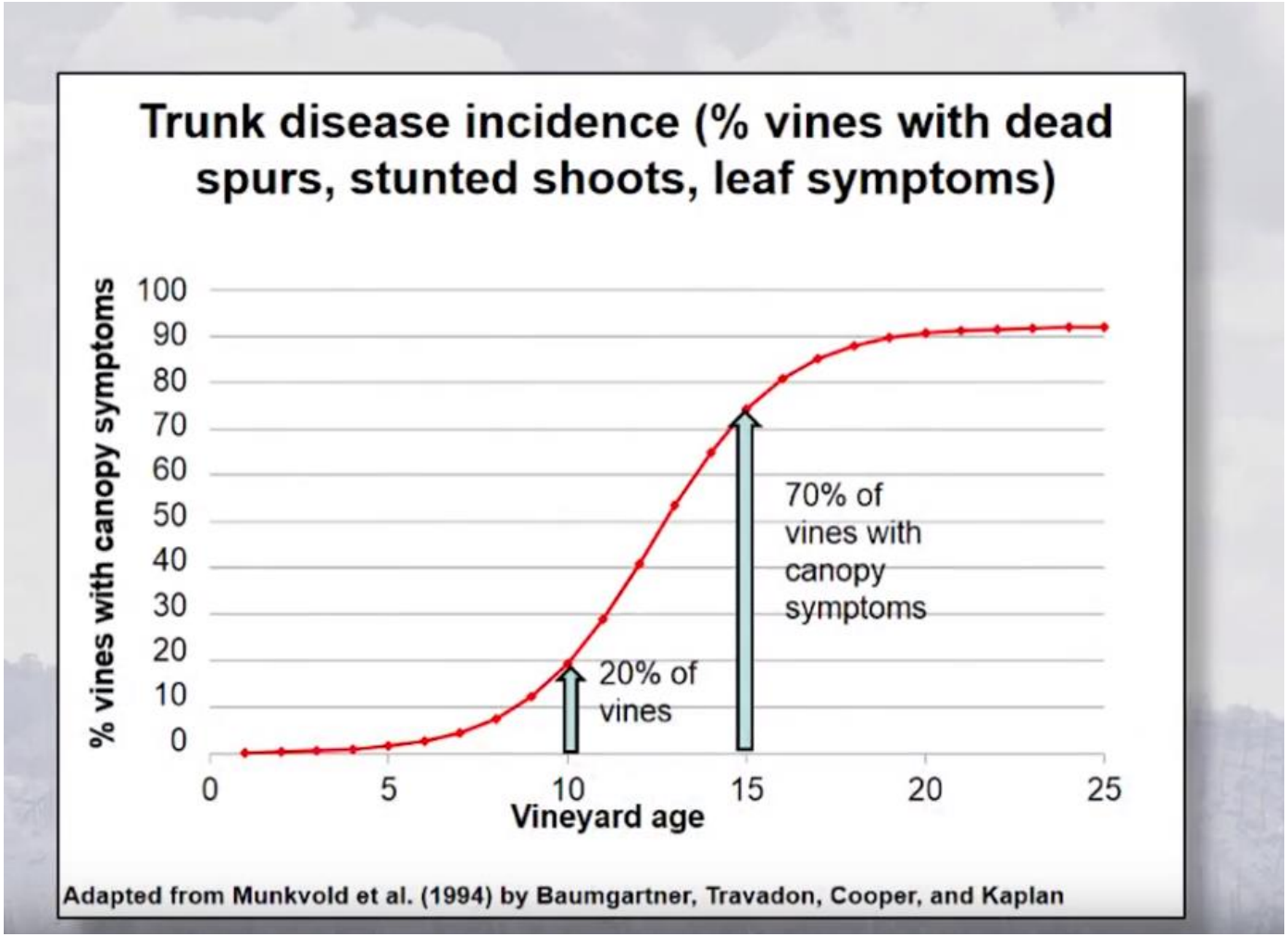
- Reduced Growth
- *Dieback / Death of Vine*
- **Reduces time span of a vineyard**
- **Dead Arm**
- **Reduced Yield**

Often Dead Arm Disease Management starts too late!



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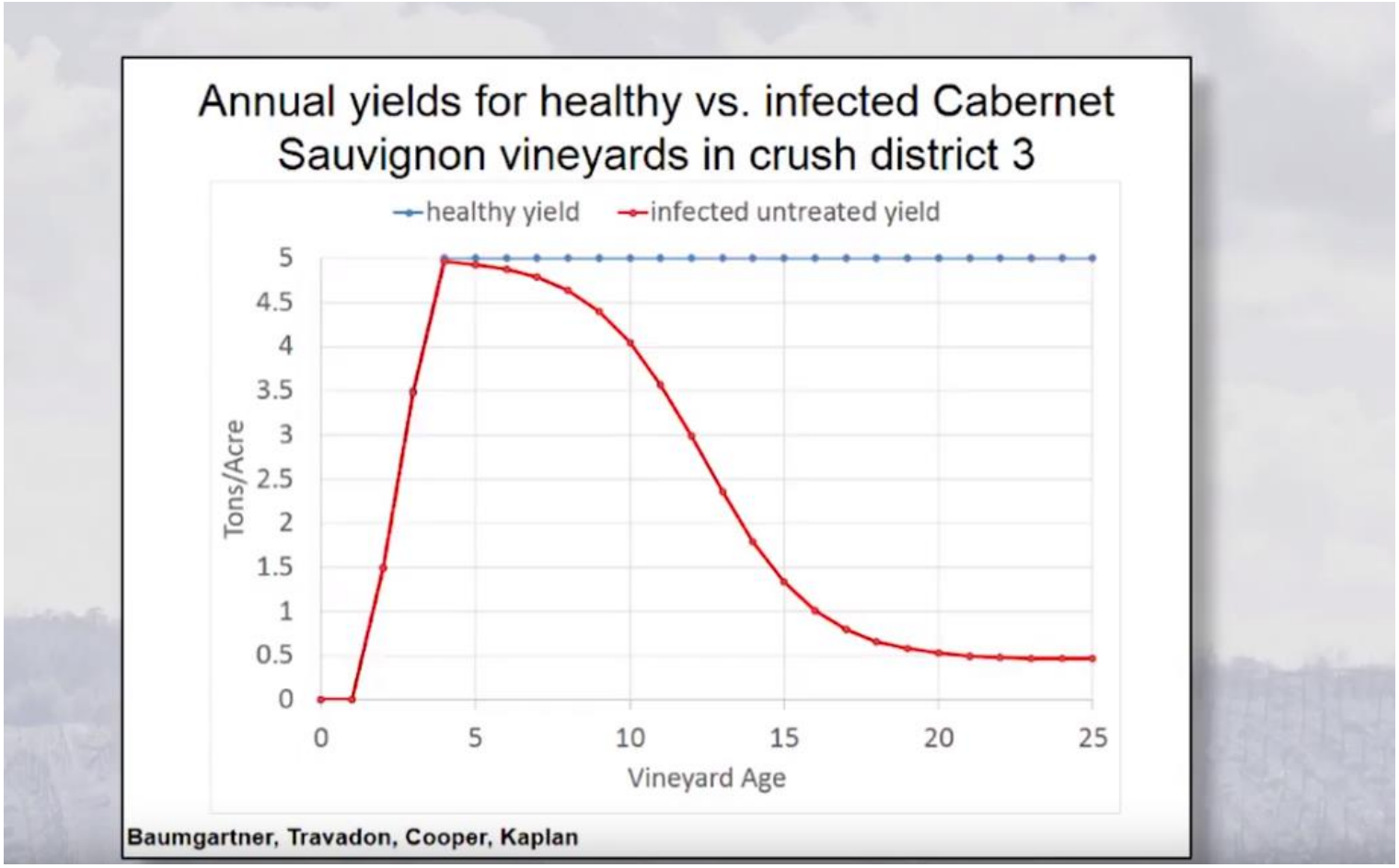

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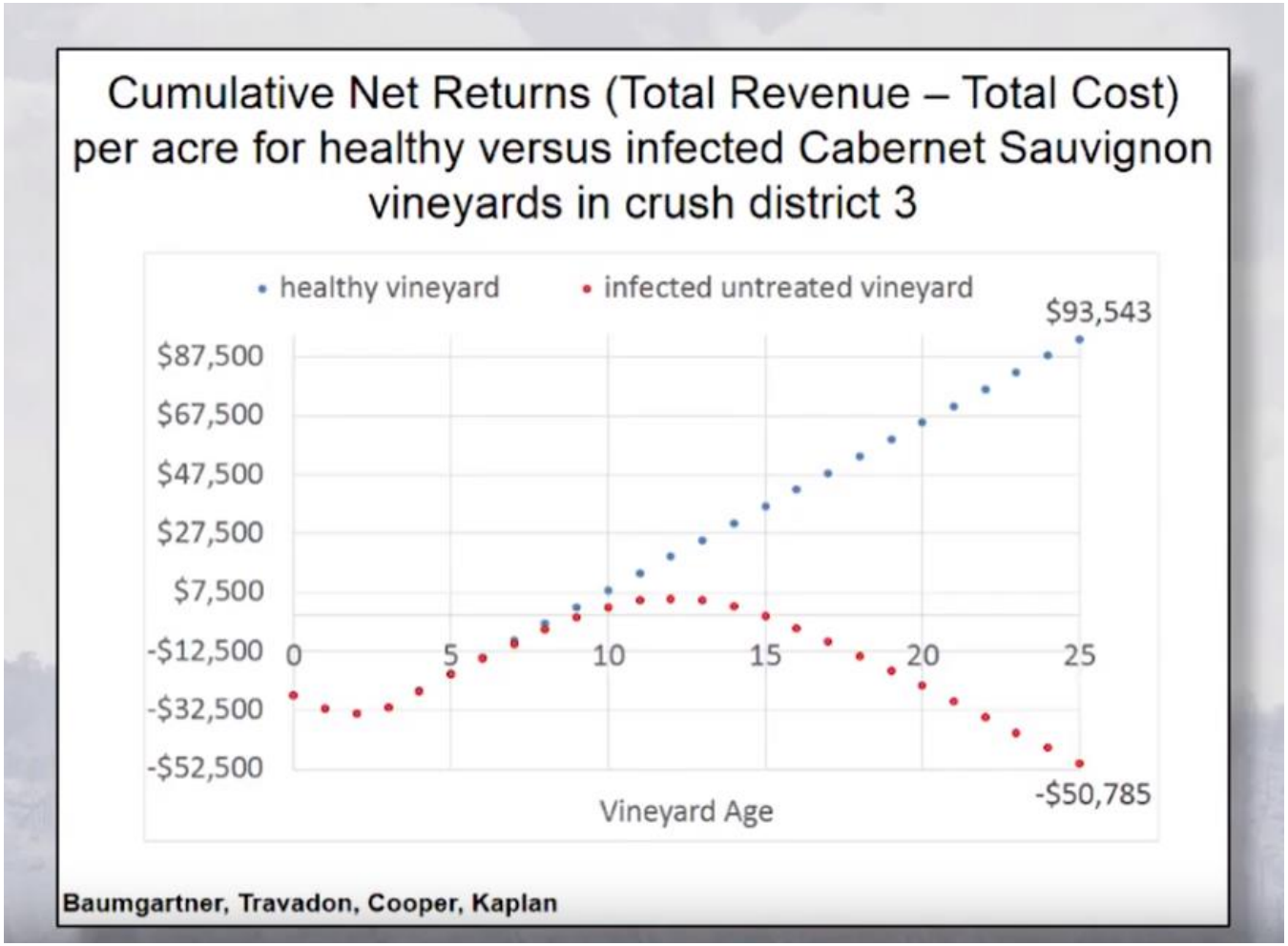

Grapevine Trunk Diseases
Latency is a problem

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vineyard:

High latency period
Symptoms not always evident
Cultural methods and climate
GTD pathogens presence in other hosts

→

Unaware of GTD spread
Loss of yield quality and quantity
Death/Dieback

nursery:

High latency period
Asymptomatic plants in production process;
High contamination risk;

→

Economic loss (unsellable material)
GTD asymptomatic plants

In North Carolina specific: No access to detection and assessment services

Gramaje et al. (2018): Managing Grapevine Trunk Diseases With Respect to Etiology and Epidemiology: Current Strategies and Future Prospects: Plant Disease 102:12-39.

Grapevine Trunk Diseases
Problems: understand your enemy!

Cold Damage

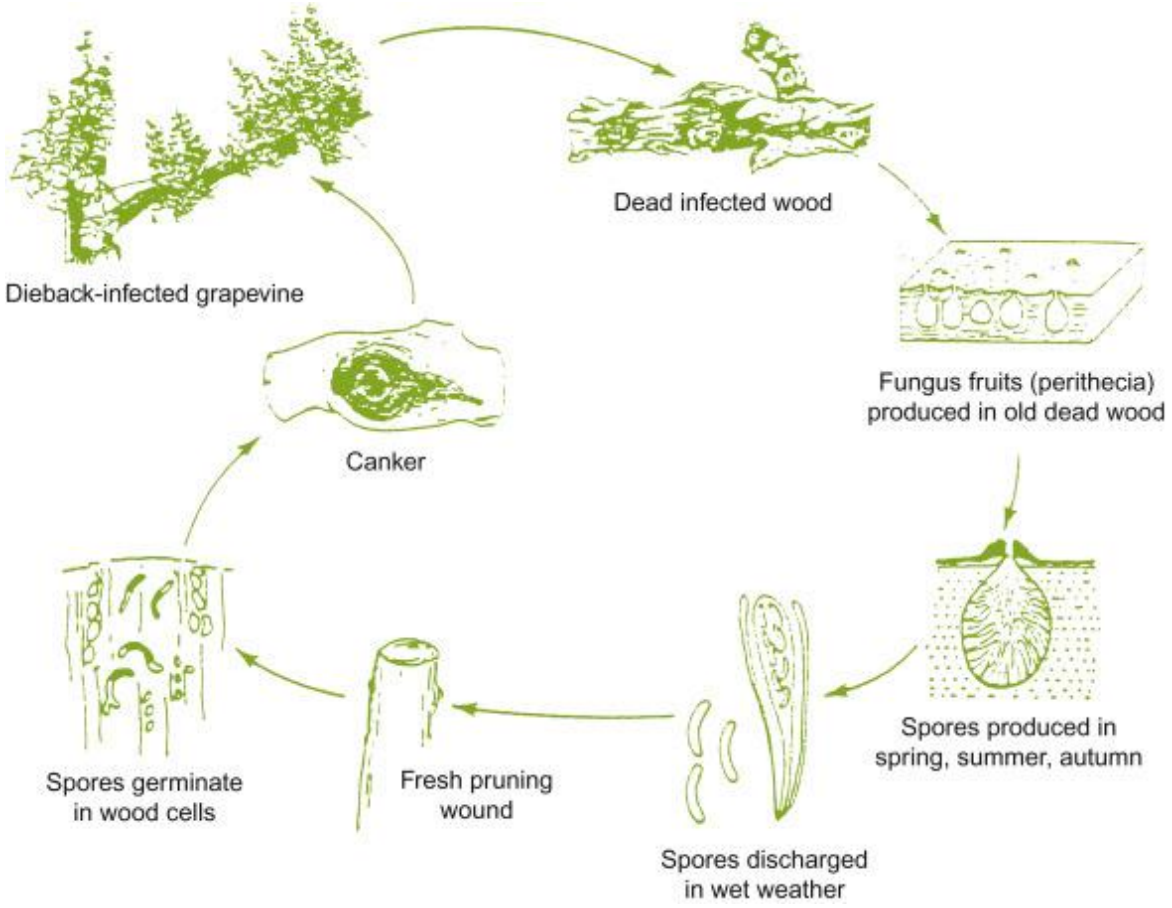
Pruning

Re-Training

Latent for many years!

Environment (other hosts)

Weather (Rain, Humidity)



Jackson 2014. Vineyard Practice, Wine Science (Fourth Edition).

Grapevine Trunk Diseases
Prevention and Management

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General rules:

(1) Start Early
(2) Stay on top of things
(3) Plan ahead

Grapevine Trunk Diseases Prevention and Management

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Start Early:

- Don’t accept nursery material with bad grafting units!!!
- Establish a personal Relationship with your nursery!!
- Ask questions about trunk disease management in nursery

Grapevine Trunk Diseases
Prevention and Management

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Stay on top of things

- Monitor vines from the very beginning
- Especially after Cold Damage!!!
- Retrain rather than leave old wood
- Don’t allow cordons to establish dead areas
- Use Topsin, VitiSeal, B-Lock

Grapevine Trunk Diseases
Prevention and Management

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Plan ahead

- Retraining can be planned!
- Order plants early!!!
- Train your crew
- Talk to Extension!!! We help!

Grapevine Trunk Diseases
Prevention and Management

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Integrated Management Practices:

Prevention
Sanitation
Pruning (Cane vs. Spur)
Control (Chemical)

Grapevine Trunk Diseases
Prevention and Management

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- Having good soil drainage
- **Double Pruning**
- **Sanitize, remove infected wood after pruning**
- **Pruning wound protectants**

Grapevine Trunk Diseases
Prevention and Management

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Pruning!

- Double Prune: Leave a long spure/cane and come back shortly before bud break and prune again.

- Think about cane vs. spur pruning systems

Grapevine Trunk Diseases Prevention and Management

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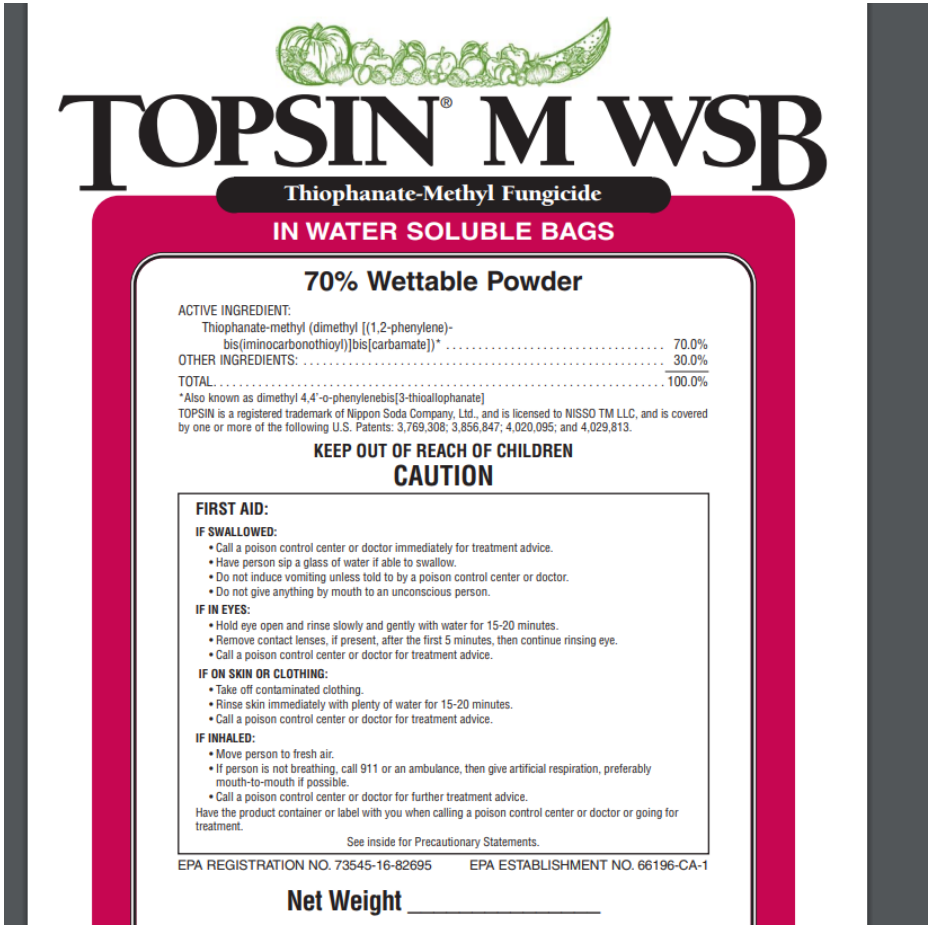
Pruning Wound Protectants!


TOPSIN® M WSB

Thiophanate-Methyl Fungicide

IN WATER SOLUBLE BAGS

70% Wettable Powder

ACTIVE INGREDIENT:
Thiophanate-methyl (dimethyl [(1,2-phenylene)-bis(iminocarbonothioyl)]bis[carbamate])* 70.0%
OTHER INGREDIENTS: 30.0%
TOTAL. 100.0%

*Also known as dimethyl 4,4'-o-phenylenebis[3-thioallophanate]

TOPSIN is a registered trademark of Nippon Soda Company, Ltd., and is licensed to NISSO TM LLC, and is covered by one or more of the following U.S. Patents: 3,769,308; 3,856,847; 4,020,095; and 4,029,813.

KEEP OUT OF REACH OF CHILDREN

CAUTION

FIRST AID:

IF SWALLOWED:
- Call a poison control center or doctor immediately for treatment advice.
- Have person sip a glass of water if able to swallow.
- Do not induce vomiting unless told to by a poison control center or doctor.
- Do not give anything by mouth to an unconscious person.

IF IN EYES:
- Hold eye open and rinse slowly and gently with water for 15-20 minutes.
- Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye.
- Call a poison control center or doctor for treatment advice.

IF ON SKIN OR CLOTHING:
- Take off contaminated clothing.
- Rinse skin immediately with plenty of water for 15-20 minutes.
- Call a poison control center or doctor for treatment advice.

IF INHALED:
- Move person to fresh air.
- If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth if possible.
- Call a poison control center or doctor for further treatment advice.

Have the product container or label with you when calling a poison control center or doctor or going for treatment.

See inside for Precautionary Statements.

EPA REGISTRATION NO. 73545-16-82695 EPA ESTABLISHMENT NO. 66196-CA-1

Net Weight _____

- **0.75-1.5 lbs/A**

Grapevine Trunk Diseases Prevention and Management

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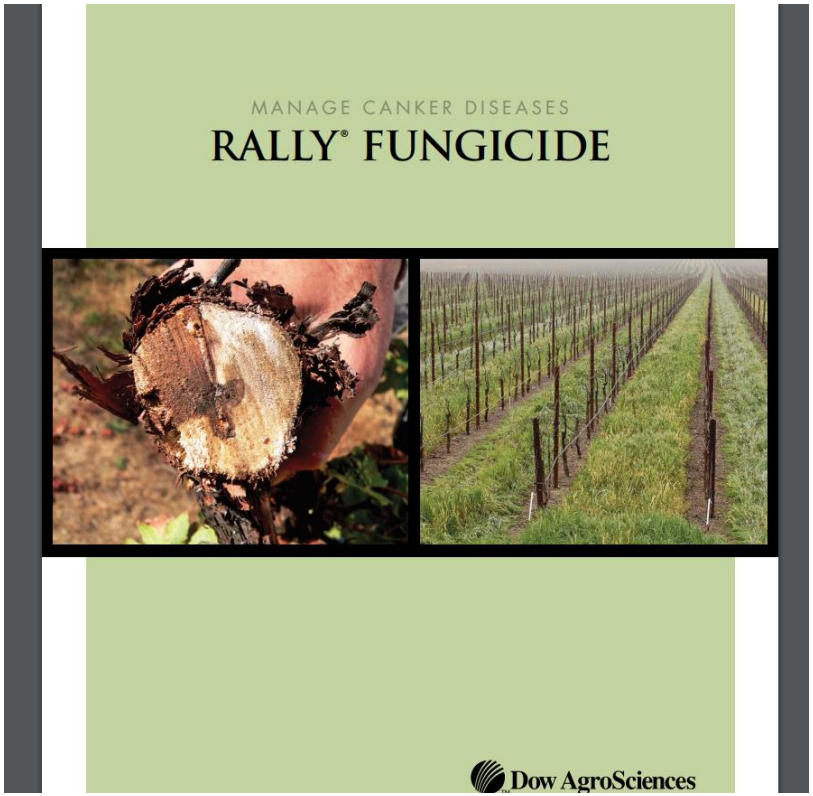
Pruning Wound Protectants!



- **4 oz/A in 33 gpa**
- **5 oz/A in 42 gpa**
- **6 oz/A in 50 gpa**

- Spray soon after pruning.
- 1-2 weeks of protection (if it doesn't rain!!!)
- REI 24hrs.
- Can be sprayed with standard vineyard sprayer

Grapevine Trunk Diseases Prevention and Management

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Pruning Wound Protectants!

- **B-Lock**

- Paint!
- 5% Boric Acid
- Apply on fresh pruning wounds
- NOT a Fungicide!
- Physical Barrier

Grapevine Trunk Diseases Prevention and Management

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Pruning Wound Protectants!

- **VitiSeal**

- Is also a barrier
- Is organic
- **Can be Tank mixed**

Contact Viti Seal Corporate
3251 Third Street
San Diego, CA 92103
619-239-0321,
info@vitiseal.com

Grapevine Trunk Diseases
Prevention and Management

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Prevention! Retrain a trunk!

- Cut back the healthy looking wood as well
- **NO COSMETIC SURGERY!**
- **Train your crew!**
- ONLY cut in dormant season!
- Take the wood out of the vineyard

Grapevine Trunk Diseases
Prevention and Management

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Prevention! Retrain the whole vine (scion)!

- Retrain a sucker (1-2 years)
- **NO COSMETIC SURGERY!**
- **Cut out the old vine until you don't see the pie canker**
- Make sure you use plenty wound protectant and often

Grapevine Trunk Diseases
Conclusions

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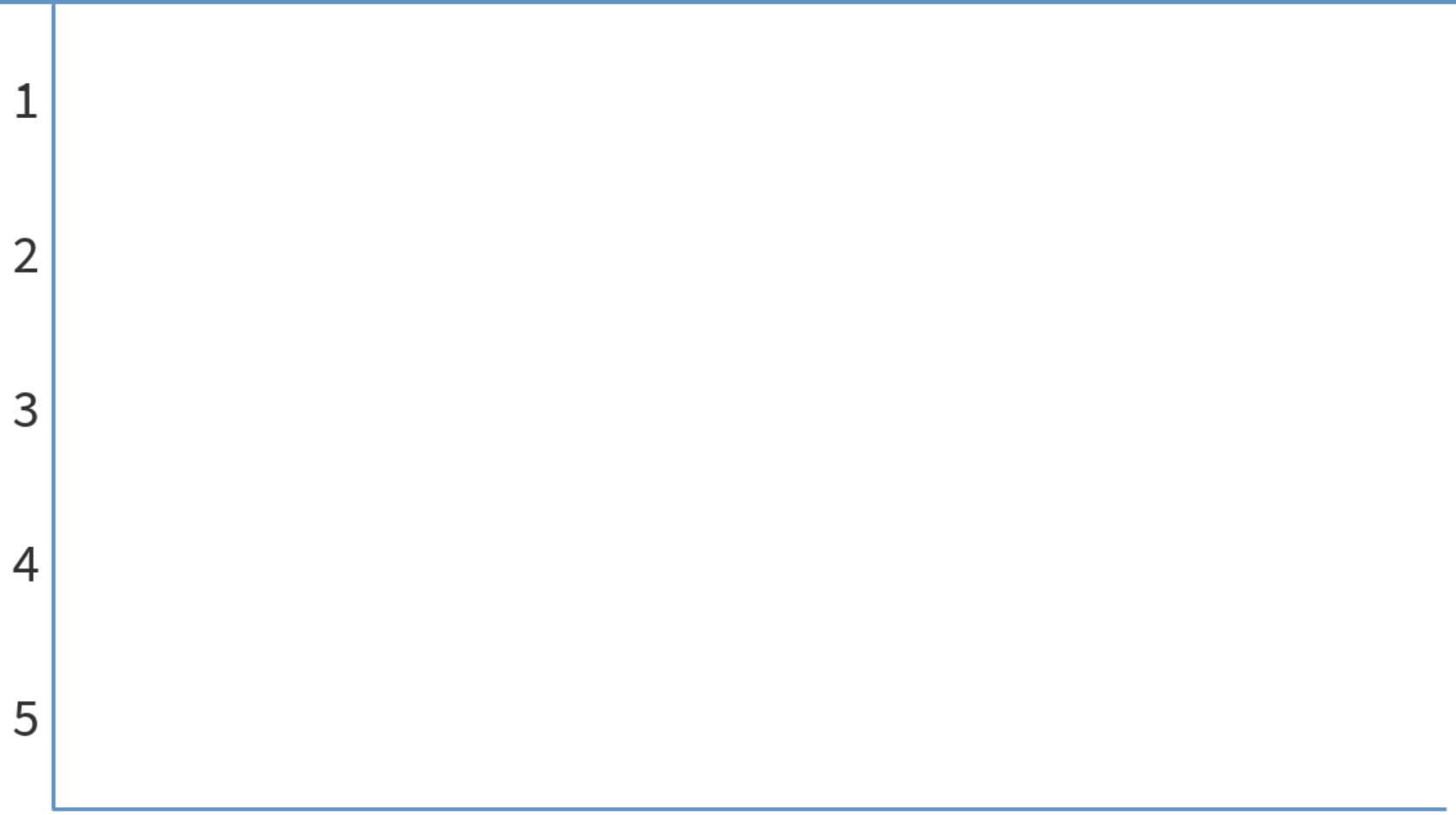
GOOD DEADARM MANAGEMENT:

Vineyard Economic Sustainablilty
Guarantees the longevity of a vineyard
Lower Labor Costs eventually

On a scale from 1 (very) - 5 (not), how important are trunk diseases for you?



Thank you!

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Thank you for your attention

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