Canadian Grapevine Certification Network Webinar Series

May 26, 2021

What are Grapevine Trunk Diseases?

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Canadian Grapevine Certification Network
CGCN · RCCV
Réseau canadien de certification de la vigne

Agriculture and Agri-Food Canada
Agiculture et Agroalimentaire Canada

Canada

• Grapevine Trunk Diseases (GTD)

- Caused by many different fungi (Ascomycota and Basidiomycota)

- Infect grapevines through wounds and openings

Pruning wounds are the main point of infection

Wounds caused by mechanical damage, re-training,…

Some GTD fungi are thought to be latent pathogens

Photo credit: J. R. Úrbez-Torres (AAFC - SuRDC)

- Overall symptoms include

Slow or rapid dieback and/or sudden vine collapse

Progressive death of plant parts such as spurs, cordons,…

Eventual death of the entire vine

- Distribution

GTDs occur wherever grapes are grown

Disease prevalence and/or pathogens' incidence may vary by geographical region

- **Grapevine Trunk Diseases (GTD): Disease Complex or Complex Diseases**

  - Young vineyards (within five years after planting)

  Black foot: *Campylocarpon*, *Ilyonectria*, *Dactylonectria*

  Petri disease: *Phaeomoniella chlamydospora*

  Phaeoacremonium spp. (*P. minimum*)

  Cadophora luteo-olivacea

  YOUNG VINE DECLINE

Photo credit: J. R. Úrbez-Torres (AAFC - SuRDC)

  - Mature vineyards

  Esca: Petri disease fungi and Basidiomycetes

  Botryosphaeria dieback: Botryosphaeriaceae spp.

  Eutypa dieback: Diatrypaceae spp. (*Eutypa lata*)

  Phomopsis dieback: *Phomopsis viticola*

Photo credit: J. R. Úrbez-Torres (AAFC - SuRDC)

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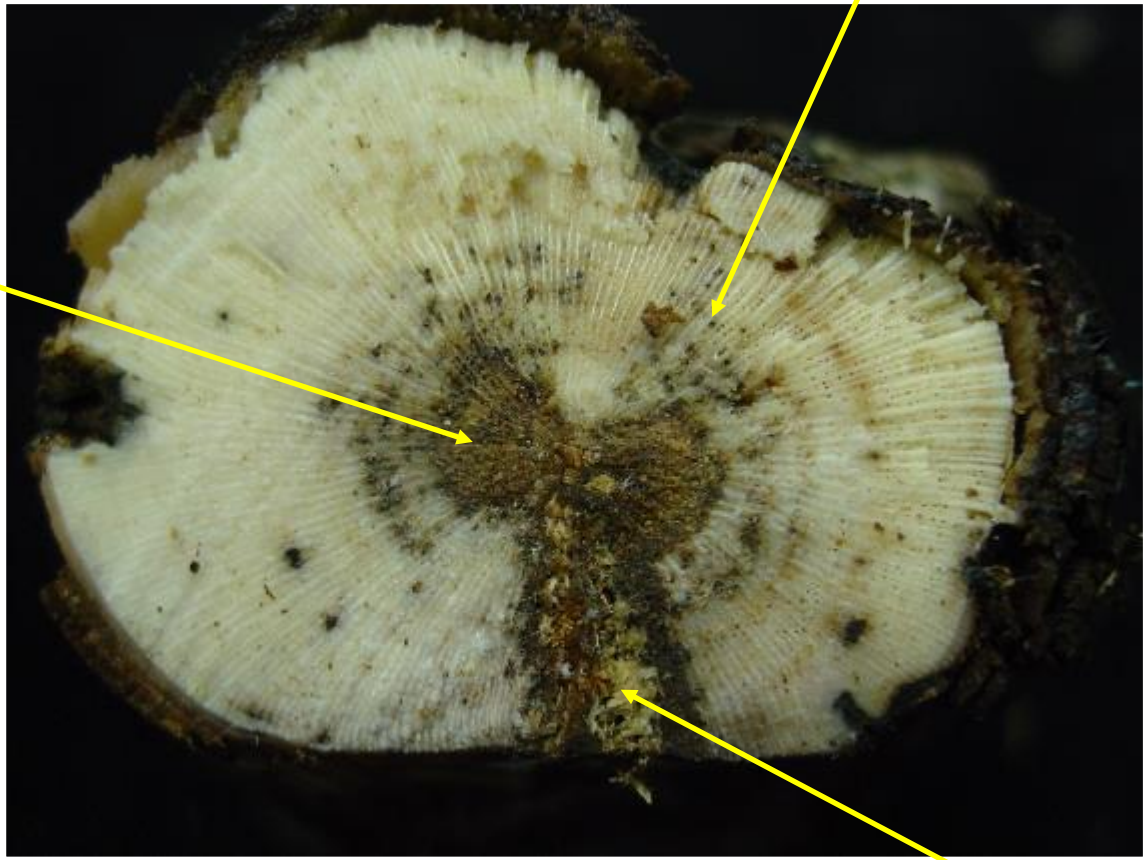
- **Grapevine Trunk Diseases (GTD): Disease Complex or Complex Diseases**

  - Symptoms overlap in the vascular system of mature vines

Dark streaking: *Phaeomoniella chlamydospora*
Phaeoacremonium spp.
Cadophora luteo-olivacea
Botryosphaeriaceae spp.

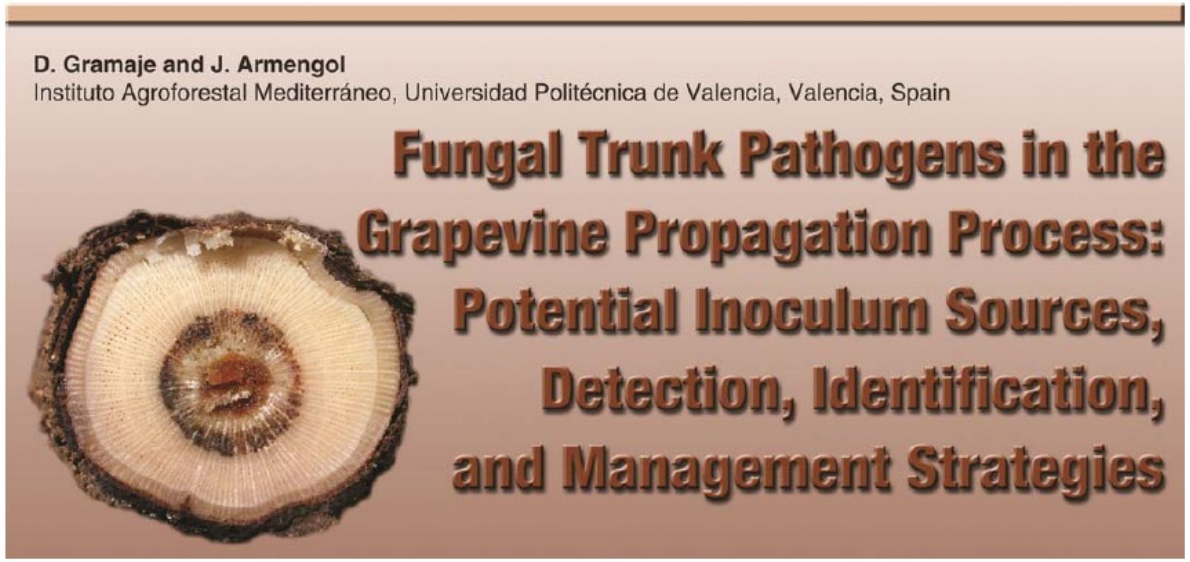
Wedge-shape canker:
Botryosphaeriaceae spp.
Diatrypaceae spp.
Phomopsis viticola



Yellowish soft wood: Basidiomycetes

• Understanding GTD pathogens' sources and spread

- GTDs in the grapevine propagation material

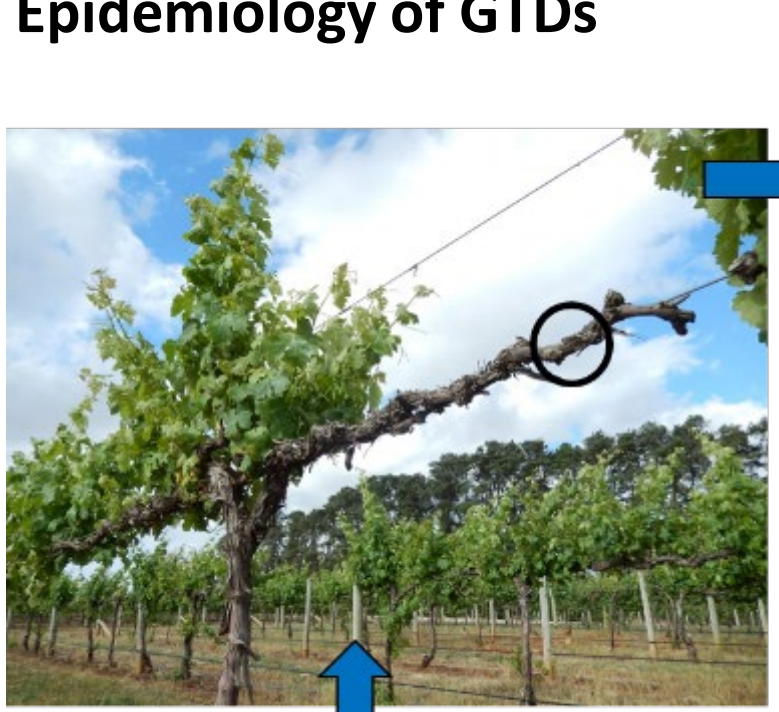


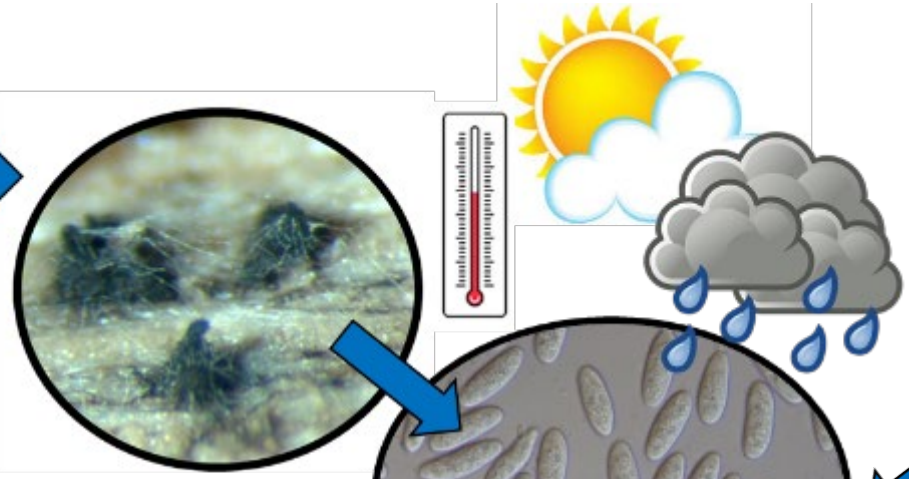
Gramaje and Armengol 2011. *Plant Disease* 95:1040-1055

Gramaje et al. 2018. *Plant Disease* 102:12-39

• Understanding GTD pathogens' sources and spread

- Epidemiology of GTDs





Alternate hosts next to vineyards

cherry

apple

Native plant communities

Picture: F. P. Trouillas

- **GTD thought to be as old as vine cultivation** (Mugnai et al. 1999. *Plant Disease* 83:404-418)
- **Why the emerging of GTD?**

- Emerging diseases: Have occurred previously but affected only a small population in isolated places

> Have occurred throughout human history but have only recently been recognized as a distinct disease due to different factors

National Institutes of Health (US); Biological Sciences Curriculum Study. Bethesda (MD) 2007. https://www.ncbi.nlm.nih.gov/books/NBK20370/

- Several hypothesis to the appearance of major GTD outbreaks since mid-1990s

"Planting booms" that resulted in poor quality material

Prohibition and/or phase-out of effective chemical controls

- Sodium arsenite banned in early 2000s
- Phase-out of benomyl in 2001

Changes in viticulture practices: High density vineyards, mechanization,…

• Economic impact of GTD

- Significant increase in management costs

Cankers cost growers about **$260 million/year** in CA

(Siebert 2001. *Wines and Vines* 4:50-56)

Eutypa in Shiraz alone costs **$20 million/year** in Australia

(Wicks and Davis 1999: Australian Grapegrower and Winemaking 406:15-16)

12% of French vineyards non-productive due to esca disease

(https://www.wine-searcher.com/m/2014/10/fatal-wood-diseases-affect-12-percent-of-french-vineyards)

Young vine decline can cause untenable economic losses due to vine replacement costs before the vineyard reaches full production and the difficulty to manage uneven vineyard blocks.


THANK YOU!