EFFECT OF TRICHODERMA sp ON THE REDUCING OF PATHOGEN AGENTS OF ESCA GRAPEVINE CANKERS IN WINEGRAPE NURSERY

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Breadth of coverage, Depth of knowledge

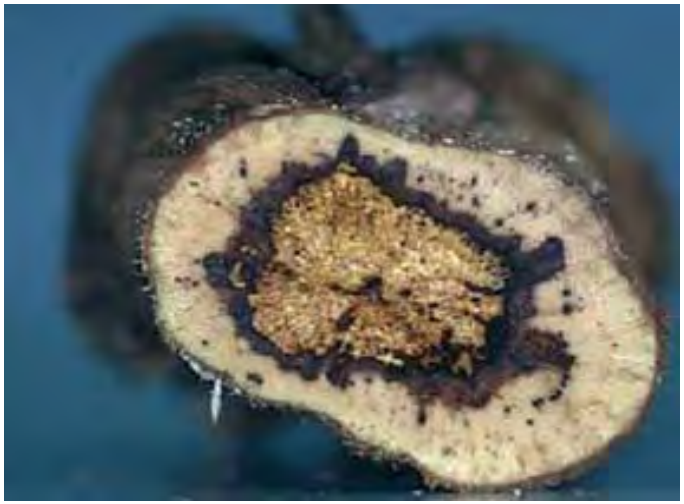
Esca BDA canker symptoms

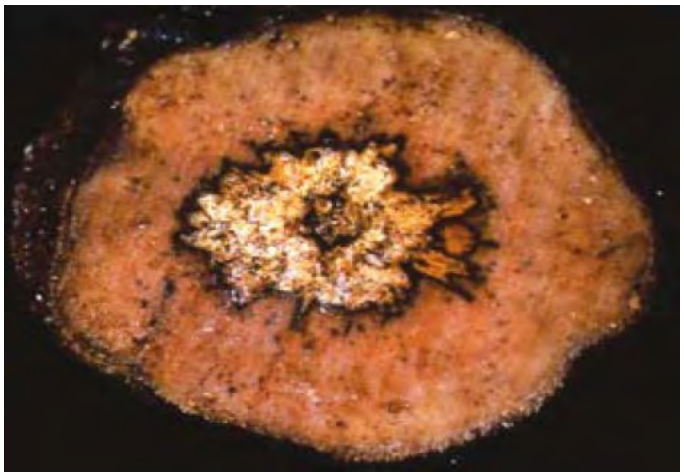
- Many plant pathogens fungus responsible

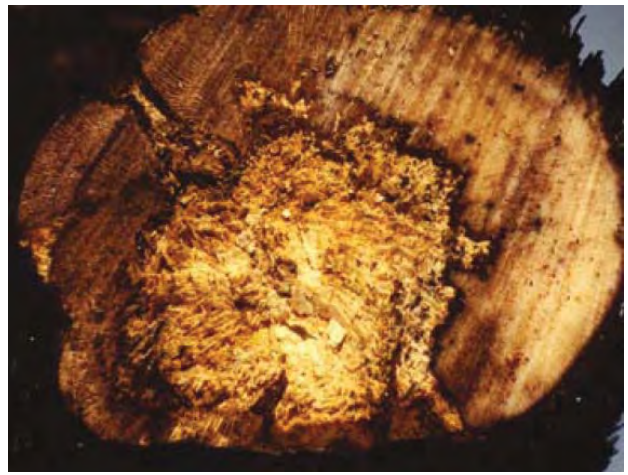
Phaeomoniella chlamydospora	*Pch*
Phaeoacremonium aleophilum	*Pal*
Botryosphaeria parva = Neofusicoccum parvum	*Npv*
Botryosphaeria obtusa = Diplodia seriata	*Dse*

Naphtalenon phytotoxins
Isosclerone chlorotic spots necrotic areas scytalone leaves become green pale near veins (Bruno, Sparapano)
AbouMansour flaviolin
Alphaglucans (pullulans) 50 to 2500 kDa Pch> Pal. impermeable wrap at cell surface.
Polypeptids 6 to 250 KDa modify conductivity of membrane permeability to protons Pch > Pal (Luini et al.)

Necrosis symptoms







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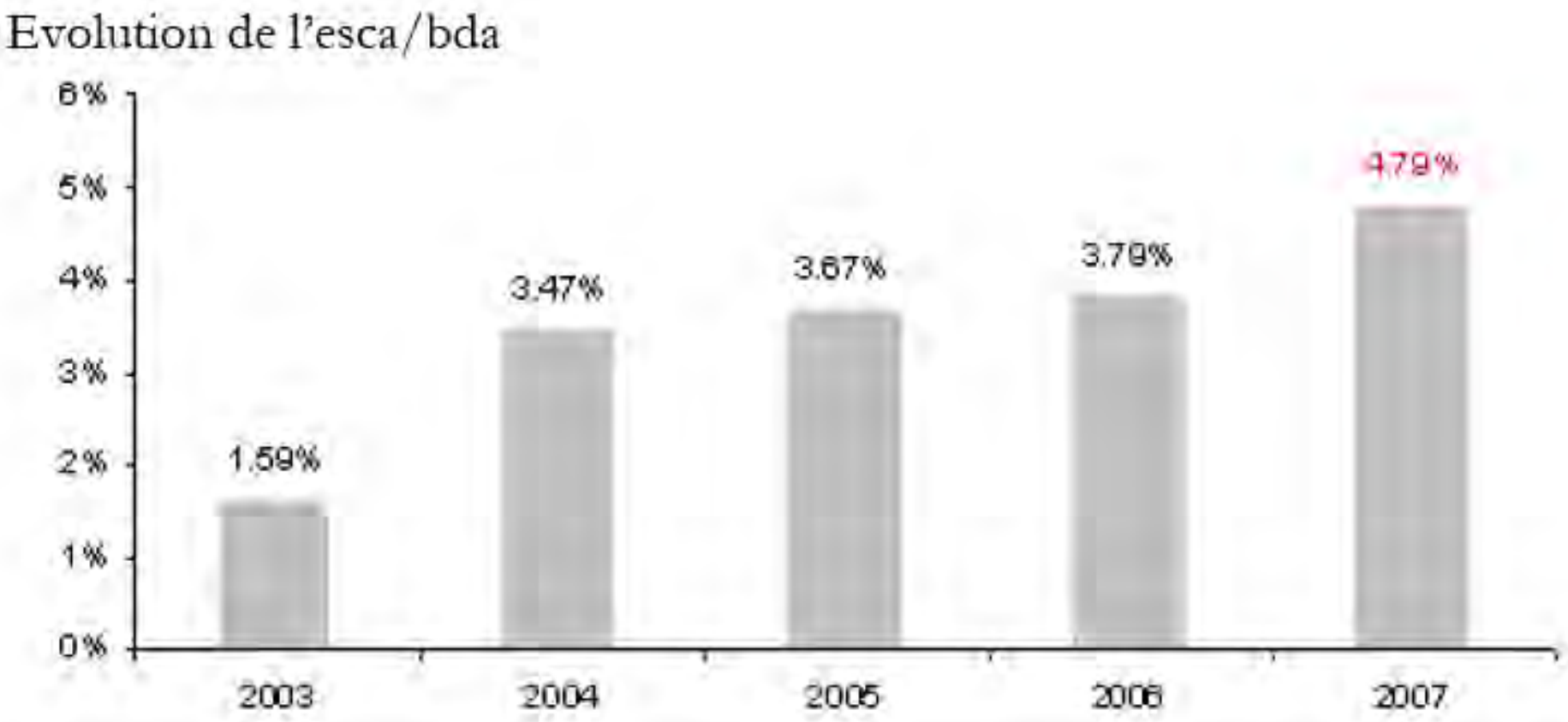
Grapevine canker an increasing threat for grapevines



Overall losses caused by Esca BDA or Eutypia dieback estimated to 260 m US$ (Siebert 2001)

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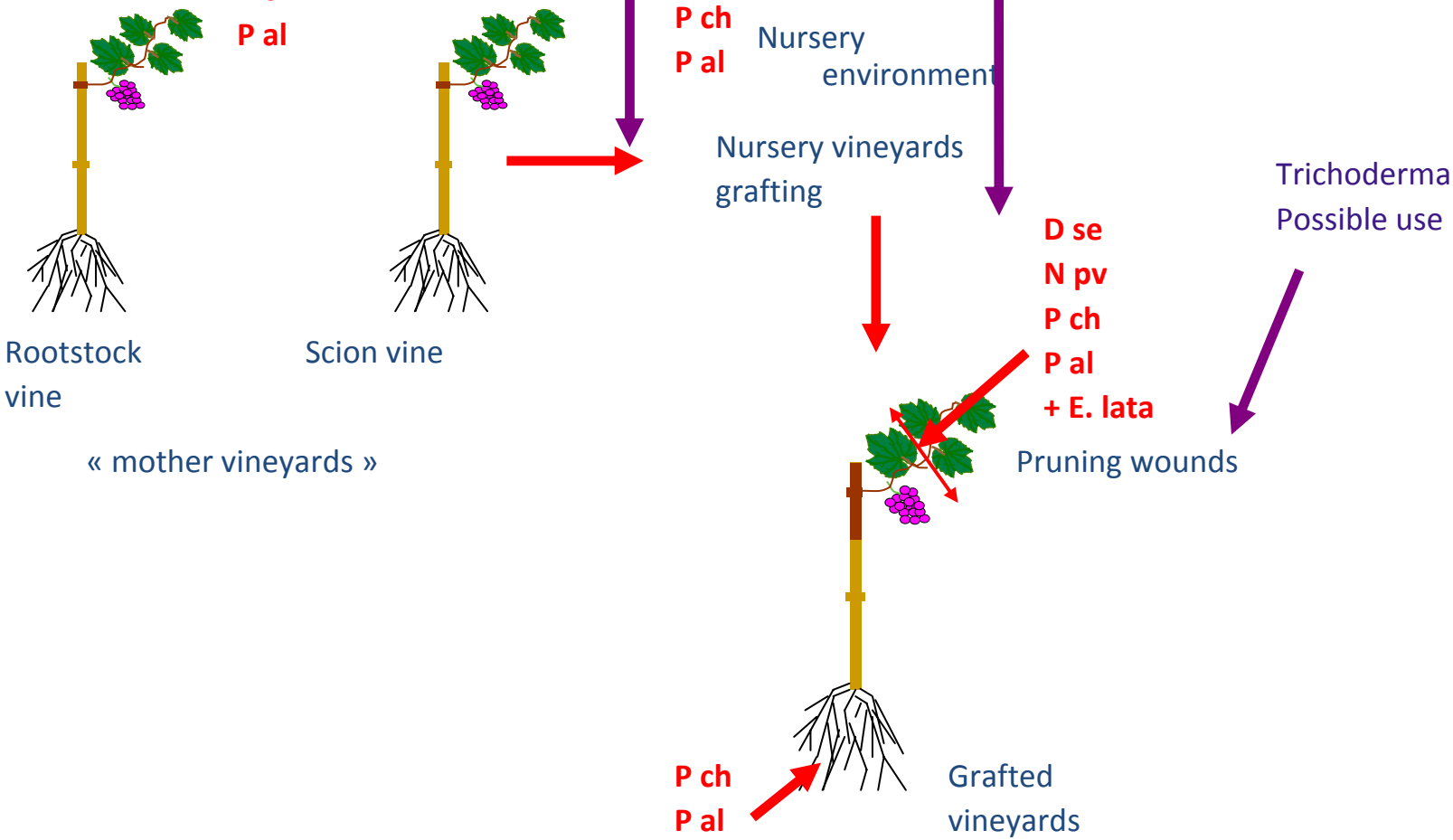
Origin of infestation



Materials and methods

- Cabernet sauvignon/3309
- Fisher randomized blocks 60 plants/plot 240 plants/treatment
- 6 treatments (included Untreated control) duplicated with and without infestation
- UTC, Trichoderma, 8 hydroxy quinoline sulfate, Copper sulfate 80 WP, mancozeb 75 WG

Materials and methods

- Before grafting scions and rootstocks drenched warm water 22°c
- Except for T. Harzianum treatments drenched warm water + 10^6 CFU mL^{-1}

Without trichoderma

With trichoderma 10^6 CFU Ml^{-1}

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Grafting

- Grafting

Omega Grafting machine

Omega grafting junction

Protection with parafinic wacks

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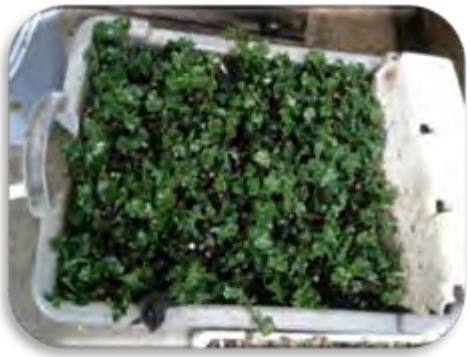
Materials and methods

- Callusing rooms over 2 weeks humidity 80%-85% and irrigated by water+ corresponding treatment dose to pack the sawdust



- Second parafinic wacks protection

- Prior to planting non acceptable grafted vines are discarded nb recorded and statistics

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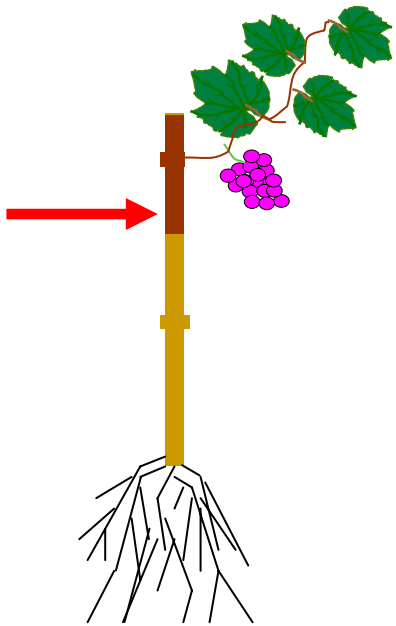
Inoculation of plants

- 1 month after planting

Inoculation with solution of Pch 10^5CFU mL^{-1}
drilling (2mm) just above the graft junction
Injection 20µL of Pch per vine plant

Inoculation of pathogens



Materials and methods

- Growth parameters analyses

- 48 plants / treatment
- Fresh weight
- Shoot length and weight
- root length, volume & weight
- Leaves weight & length
- Global visual assessment as per QA control

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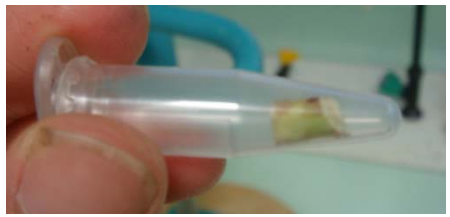
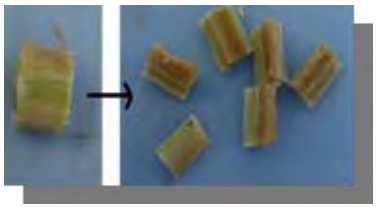
Materials and methods

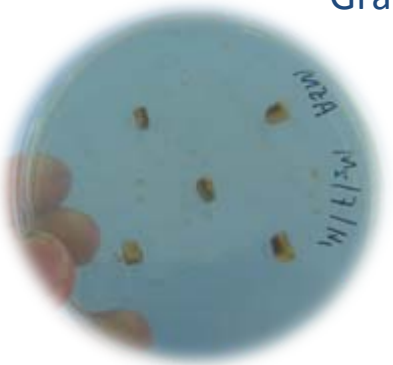
- Microbiological assessments

- 12 plants per treatment
- 3 plant's level investigated
- 5 replicates of slices sections / level plated on petri dishes



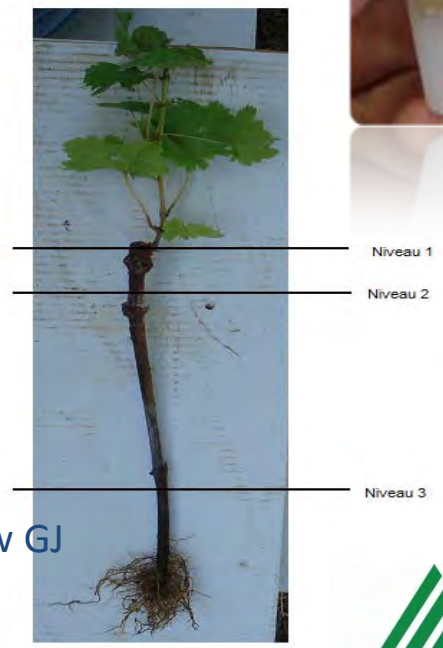
- Deep frozen -70°c for PCR quantitation





scion

Graft Junction



Rootstock 15 cm below GJ

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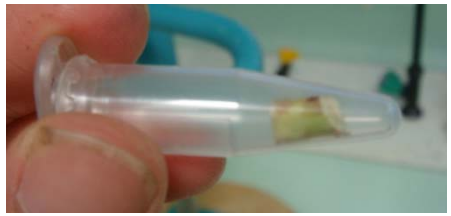
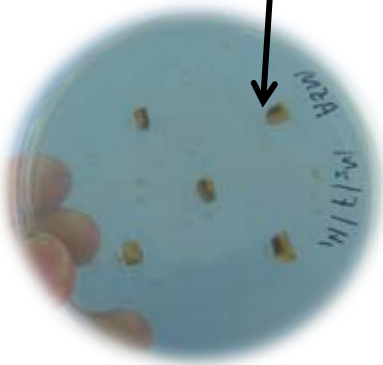
Microbiological assessments

- 5 sample sections / level plated on petri dishes
- MEA (15g/L malt, 15g/L agar) + chloramphenicol
- incubated in stove 28-30°c 21 days

preserved -70°C for PCR quantitation





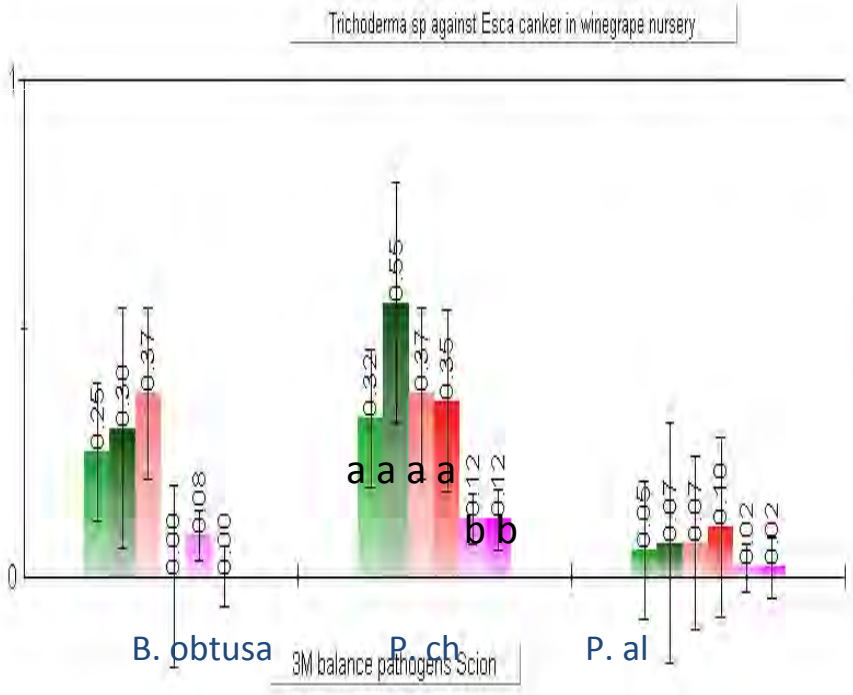
B.obtusa

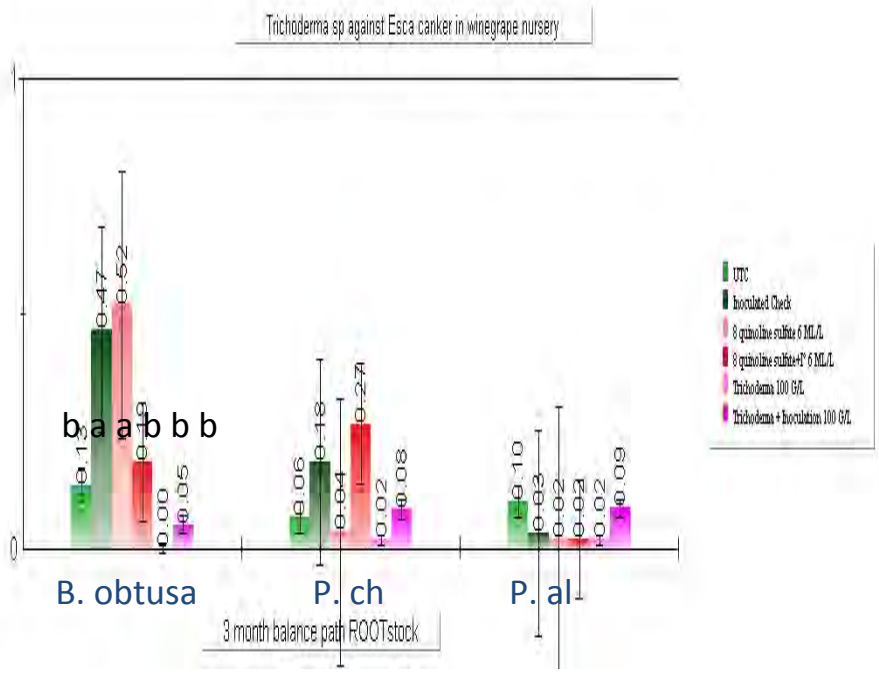
P.chlamydospora

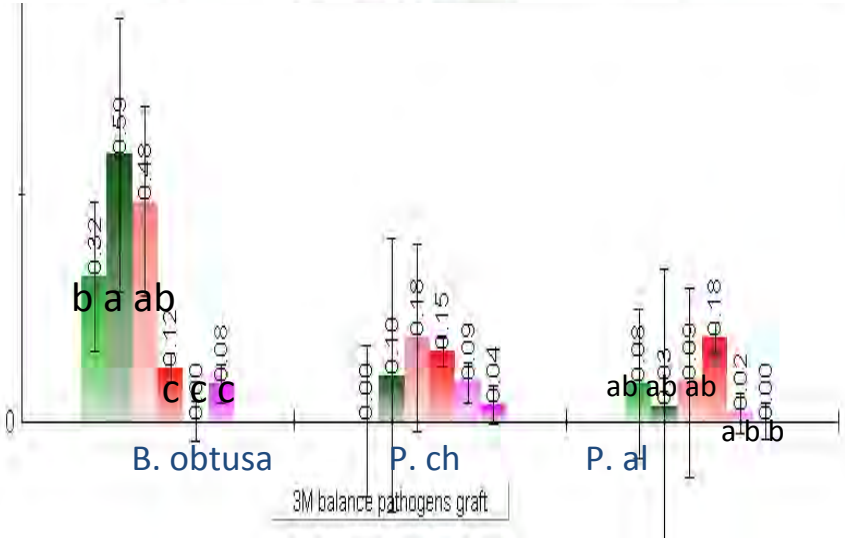
P.aleophilum

B. parva

Results : 3 month Pathogens dispatch







- B. obtusa 25 % scion, 31% at graft junction, 13% at root level
- P.chlamydospora 32% scion vs lower amount at graft junction and root

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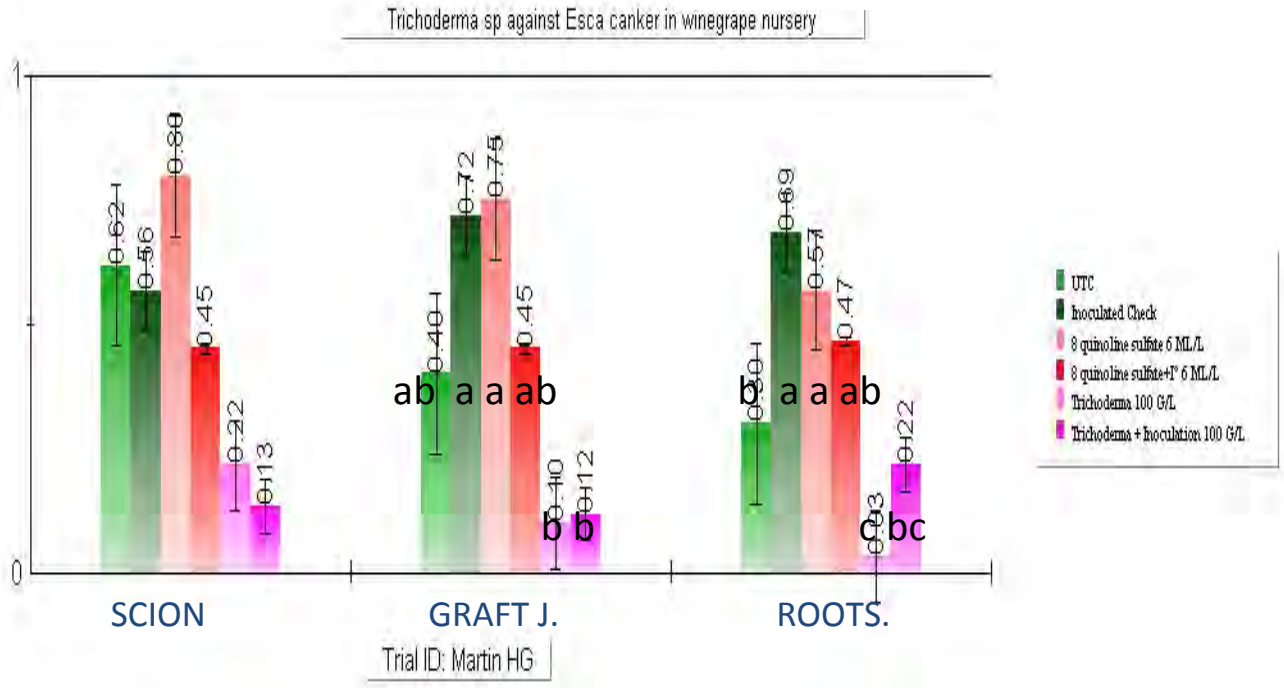
All pathogens 3 month / plant levels



- P.chlamydospora reduced to 10% infected boxes on Trichoderma sp treatments
- Same for B. obtusa and P. al

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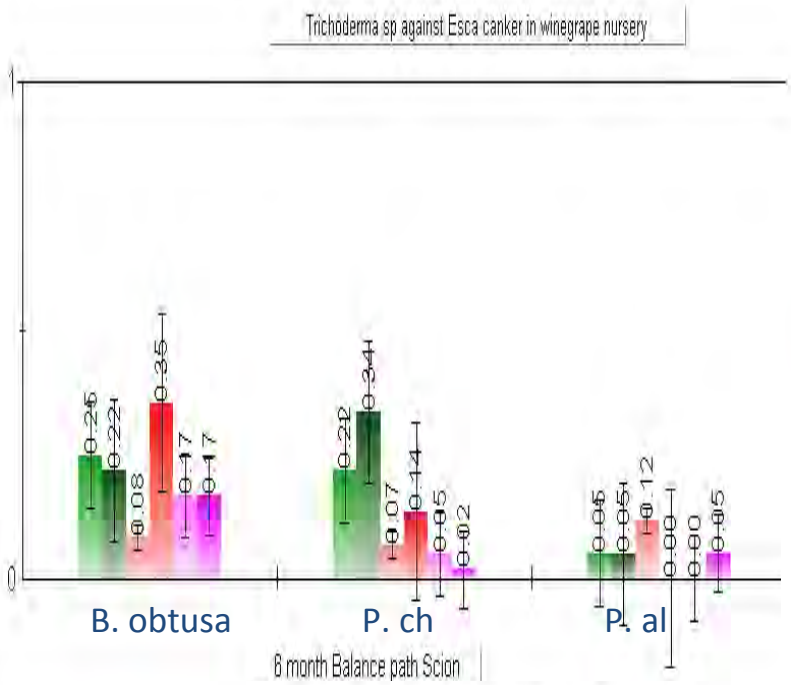
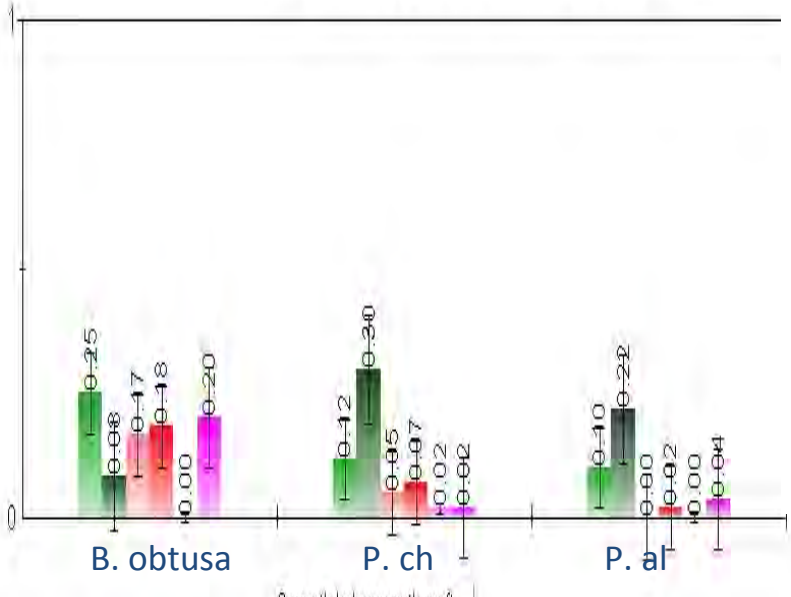
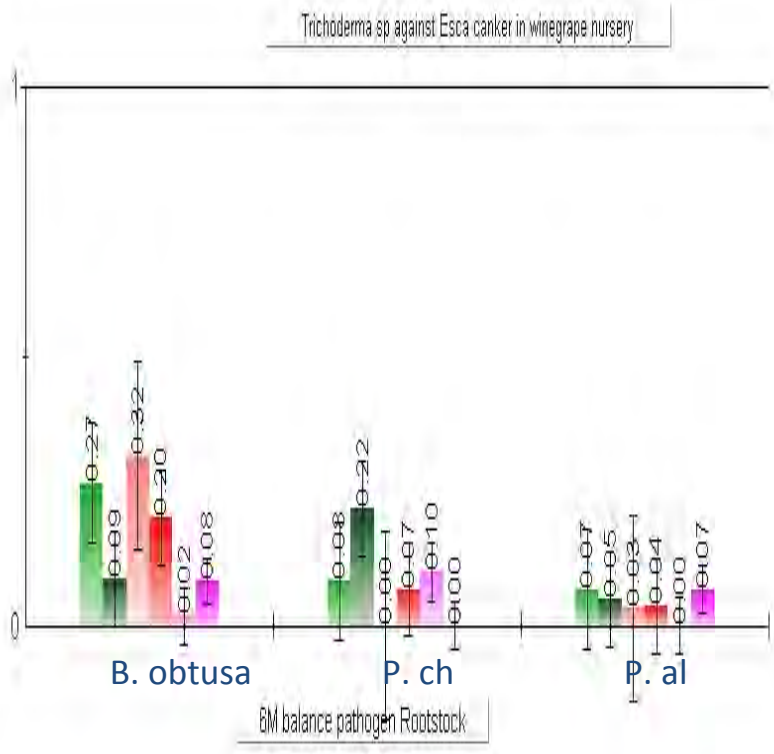


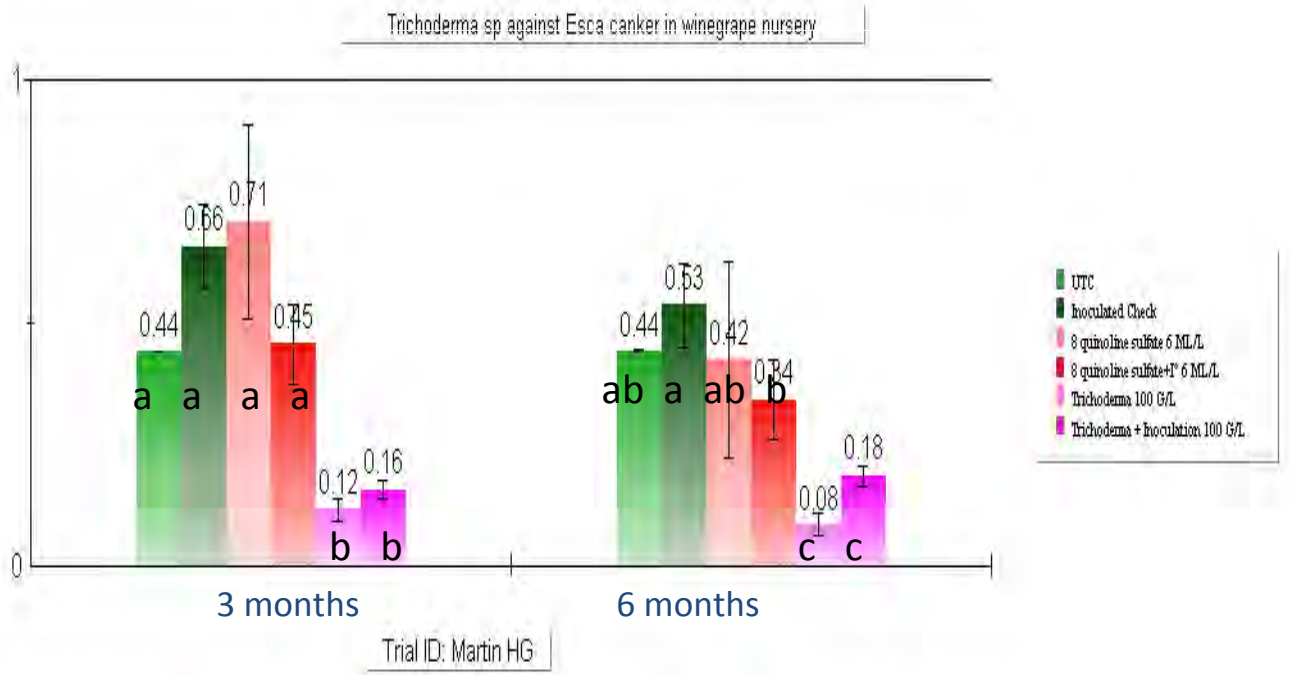
6 month Pathogens dispatch

- No big changes after 6 month
- Presence of B. obtusa
- Higher presence of P.ch in the infected treatment





Microbiological results



- A significant difference with Trichoderma treatments vs Hydroxyquinoline sulfate and UTC considering all plant levels and all pathogens investigated.

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Conclusion

- No differences founded regarding Growth parameters
- Experiment should be carried over much more time
- Significant differences founded either 3 months and 6 months
- Microbial analyses to be linked with PCR quantitation

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- *Merci pour votre attention*
- *Thanks for your attention*
- *Vielen Dank für ihre Aufmerksamkeit*
- *Grazie di su attenzione*
- *Gracias para su attención*
- *Graças pela sua atenção*
- *Efharisto gia tin prosoxi sas*
- *Dziękuję za uwaga*

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ISAGRO S.p.A.
Centro Uffici San Siro
Fabbricato D - ala 3
Via Caldera, 21 - 20153 MILANO
Tel. 02 409011 (centr.) - 02 40901276 (sett. Qualità)

MANIPOLARE CON PRUDENZA

COMPOSIZIONE

Trichoderma harzianum (ceppo ICC 012) –
(UFC unità formanti colonie 5 x 10^7 per grammo) g 2
Trichoderma viride (ceppo ICC 080)
(UFC unità formanti colonie 5 x 10^7 per grammo) g 2
Coformulanti q.b. a g 100

Partita N.: vedi timbro

Contenuto netto: 1 kg

Stabilimento di produzione: Isagro S.p.A. - Aprilia (Latina)

Distribuito da: ISAGRO ITALIA S.r.l.
Via Caldera, 21 - 20153 Milano

- Ready mix Trichoderma harzianum and T. viride