

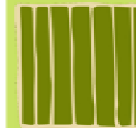
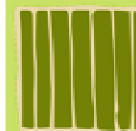
Giornata S.O.I., gruppo di lavoro Actinidia Latina, 19/3/2019

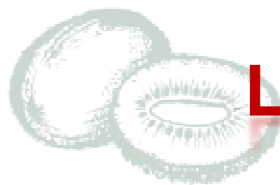
Marco Scortichini

CREA - Centro di ricerca per l'Olivicoltura, Frutticoltura e Agrumicoltura
Roma



LE EMERGENZE FITOSANITARIE DELL'ACTINIDIA E IL CAMBIAMENTO CLIMATICO





LE RELAZIONI TRA CAMBIAMENTO CLIMATICO E LE MALATTIE DELLE PIANTE

Annu. Rev. Phytopathol. 1999. 37:399-426
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CLIMATE CHANGE AND PLANT DISEASE MANAGEMENT

Stella Melugin Coakley

*Department of Botany and Plant Pathology, Oregon State University, Corvallis,
Oregon 97331; e-mail: coakleys@bcc.orst.edu*

Harald Scherm

*Department of Plant Pathology, University of Georgia, Athens, Georgia 30602;
e-mail: scherm@uga.edu*

Sukumar Chakraborty

*CSIRO Tropical Agriculture, CRC for Tropical Plant Pathology, University of
Queensland, Queensland 4072 Australia; e-mail: sukumar.chakraborty@tag.csiro.au*

Key Words climate variability, epidemiological models, global warming,
host-pathogen interactions, risk and impact assessment

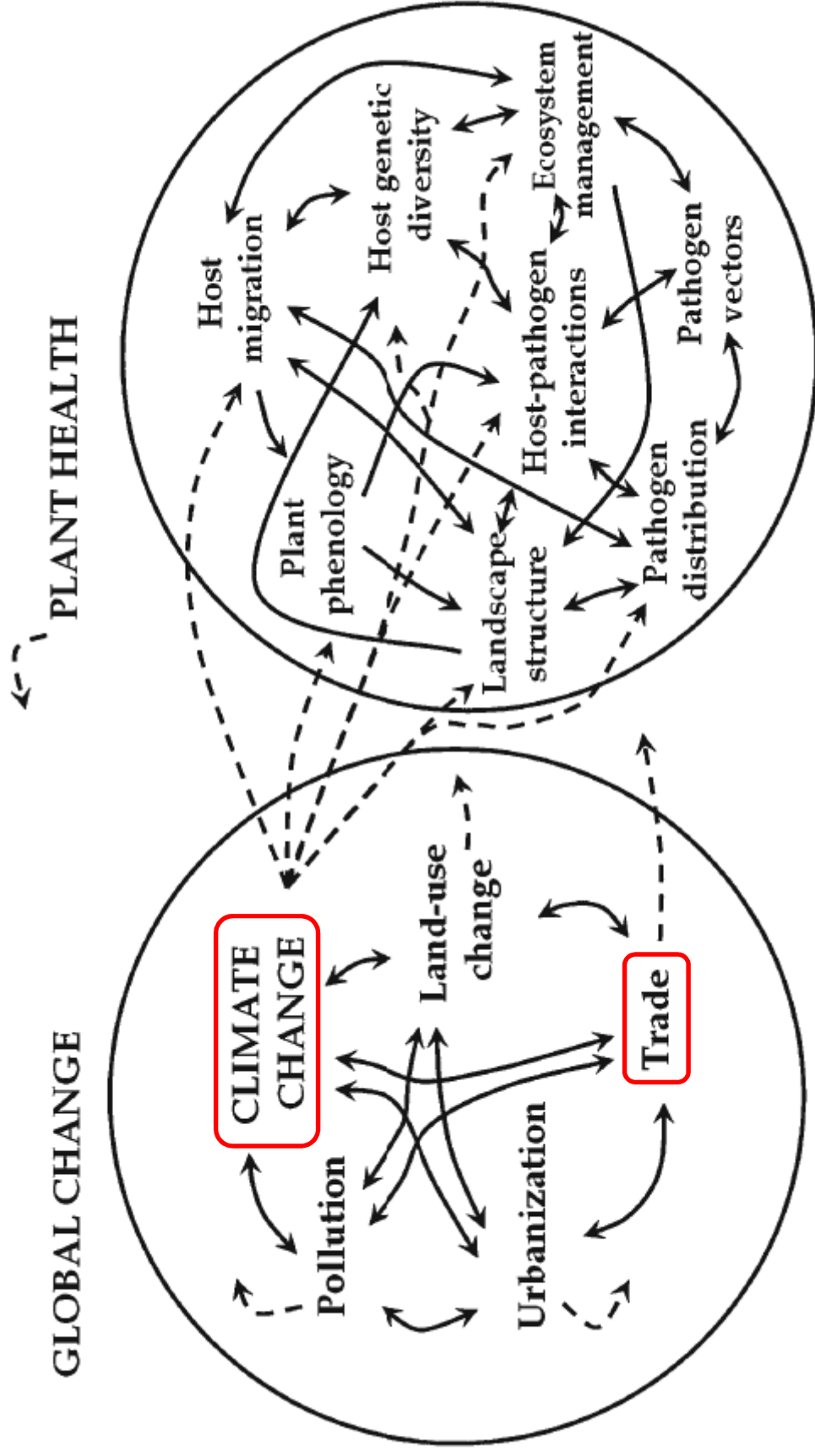


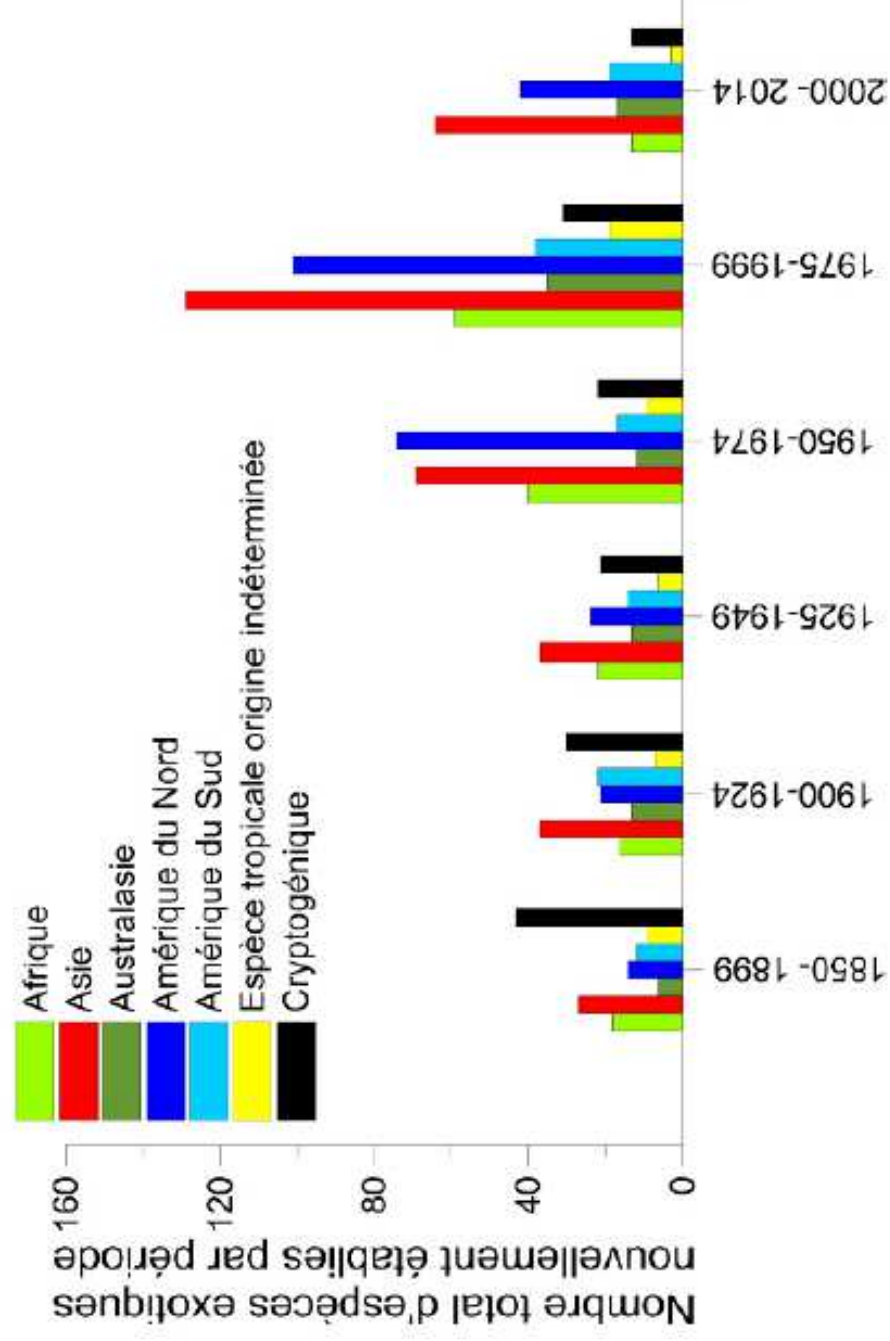
Climate change and globalization, drivers of insect invasions

Auteurs :

ROQUES Alain, Directeur de recherche à l'INRA, URZF (Unité de Zoologie Forestière), Orléans .

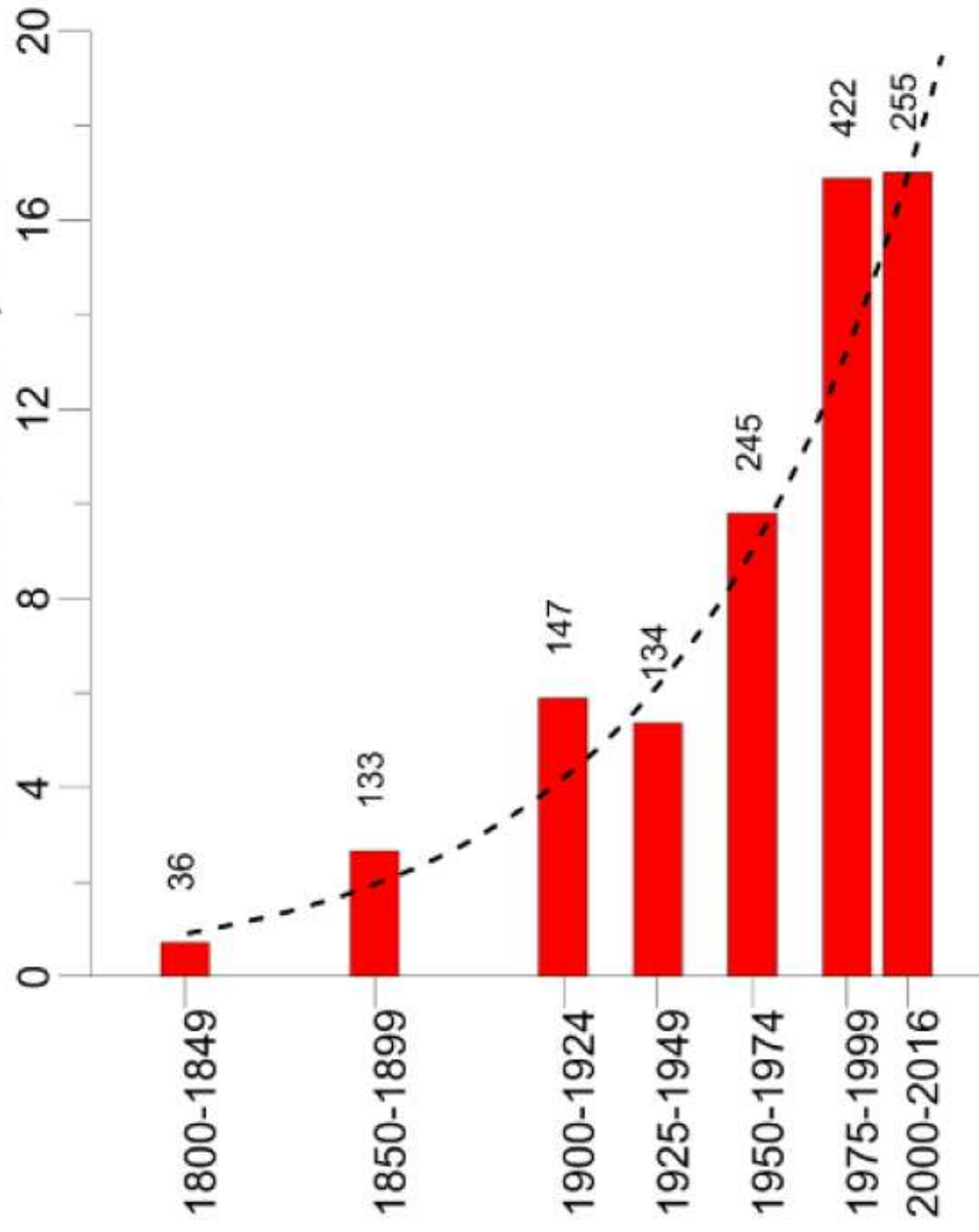
AUGER-ROZENBERG Marie-Anne, Directrice de recherche à l'INRA, URZF (Unité de Zoologie Forestière), Orléans.







Nombre moyen d'espèces exotiques nouvellement établies par an





Impacts of Temperature Increase on Plant Health

Pests

- improved winter survival
- increased fertility
- accelerated population development
- raised virulence
- better dispersal opportunities
- reduced dormancy
- increased growth
- enlarged geographical range

Hosts

- induced stress in/decreases susceptibility
- breakdown of resistance mechanisms
- increased lignification of plant(+)

Environment

- change in effectiveness of nat. predators
- Imbalance of development synchrony
- change of ecosystem may affect distribution & new pest introductions

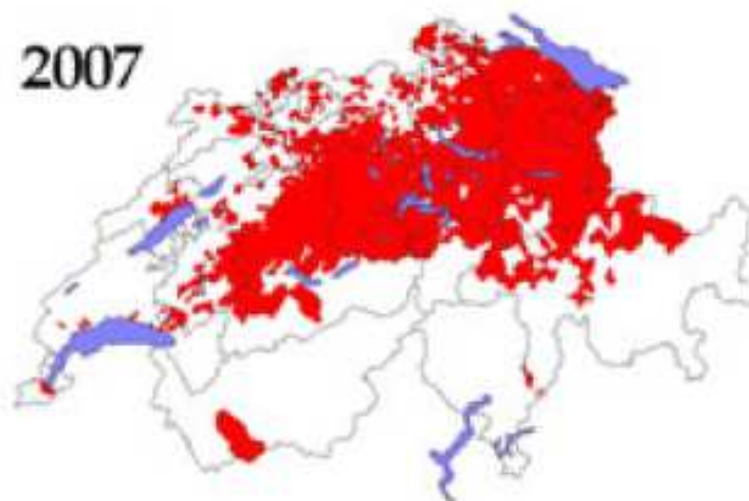
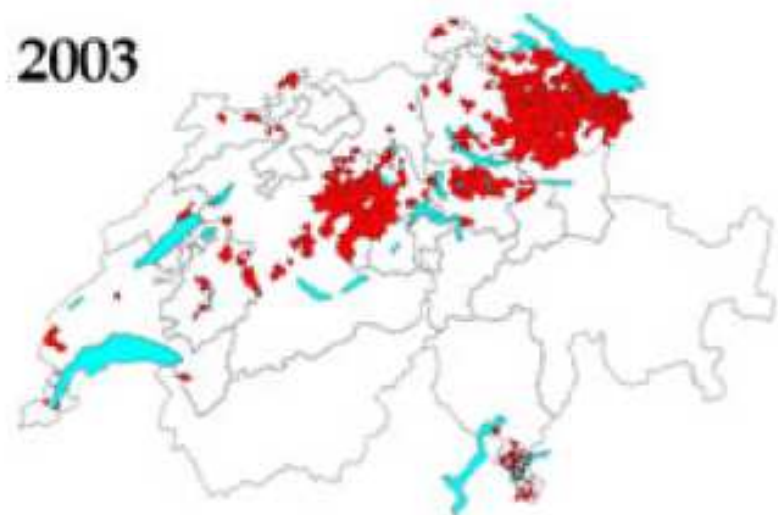
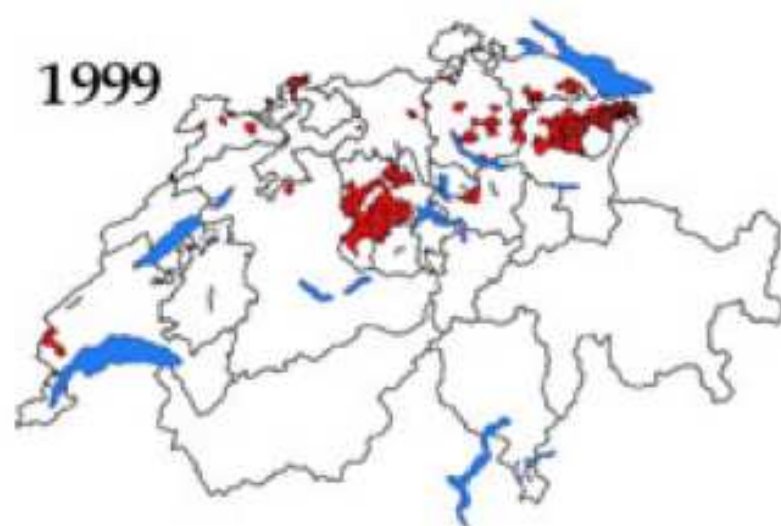
Humans

- extension of production period (+/-)
- increased pesticide applications (+-)
- shifts in plant breeding (+/-)
- shifting crop production ranges
- increased trade of host commodities



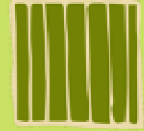


“Colpo di fuoco” batterico delle Pomacee in Svizzera





Relazione tra clima e “batteriosi” dell’actinidia (PSA)



RESEARCH ARTICLE

Modeling and mapping the current and future distribution of *Pseudomonas syringae* pv. *actinidiae* under climate change in China

OPEN ACCESS

Citation: Wang R, Li Q, He S, Liu Y, Wang M, Jiang G (2018) Modeling and mapping the current and future distribution of *Pseudomonas syringae* pv. *actinidiae* under climate change in China. PLoS ONE 13(2): e0192153. <https://doi.org/10.1371/journal.pone.0192153>

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Rulin Wang^{1,2}*, **Qing Li**¹*, **Shisong He**³, **Yuan Liu**³, **Mingtian Wang**⁴, **Gan Jiang**²

1 College of Agronomy, Sichuan Agricultural University, Chengdu, Sichuan, China, **2** Sichuan Provincial Rural Economic Information Center, Chengdu, Sichuan, China, **3** The Kiwifruit Institute of Cangxi Country, Cangxi, Sichuan, China, **4** Sichuan Meteorological Observatory, Chengdu, Sichuan, China

SOI Actinidia
Latina, 19/3/2019





Table 1. Estimates of contribution and permutation importance of environmental variables in MaxEnt modeling of Psa.

Variables	Percent contribution	Permutation importance
Maximum temperature in April (°C)	19	2.3
Mean temperature of the coldest quarter (°C)	14	14.8
Precipitation in May (mm)	11.5	2.6
Minimum temperature in October (°C)	10.8	1
Maximum temperature in October (°C)	8.7	0.5
Precipitation in September (mm)	6.4	5.4
Mean diurnal range (°C)	5.7	10
Minimum temperature of the coldest month (°C)	3.8	7.7
Maximum temperature in February (°C)	2.9	0.2
Annual temperature range (°C)	2.7	5
Maximum temperature in December (°C)	2.6	1.1
Annual precipitation (mm)	2.3	2.7
Maximum temperature in September (°C)	1.7	0.4
Altitude (m)	1.3	2.2
Maximum temperature of the warmest month (°C)	1.2	2.7
Mean temperature of the driest quarter (°C)	1.1	7.5
Mean temperature in May (°C)	1.1	21.8
Minimum temperature in November (°C)	0.8	0.6
Minimum temperature in April (°C)	0.7	0.3
Precipitation of the driest month (mm)	0.6	1.7
Precipitation in December (mm)	0.6	7.4
Minimum temperature in March (°C)	0.4	1.7
Maximum temperature in November (°C)	0.1	0.1

<https://doi.org/10.1371/journal.pone.0192153.t001>



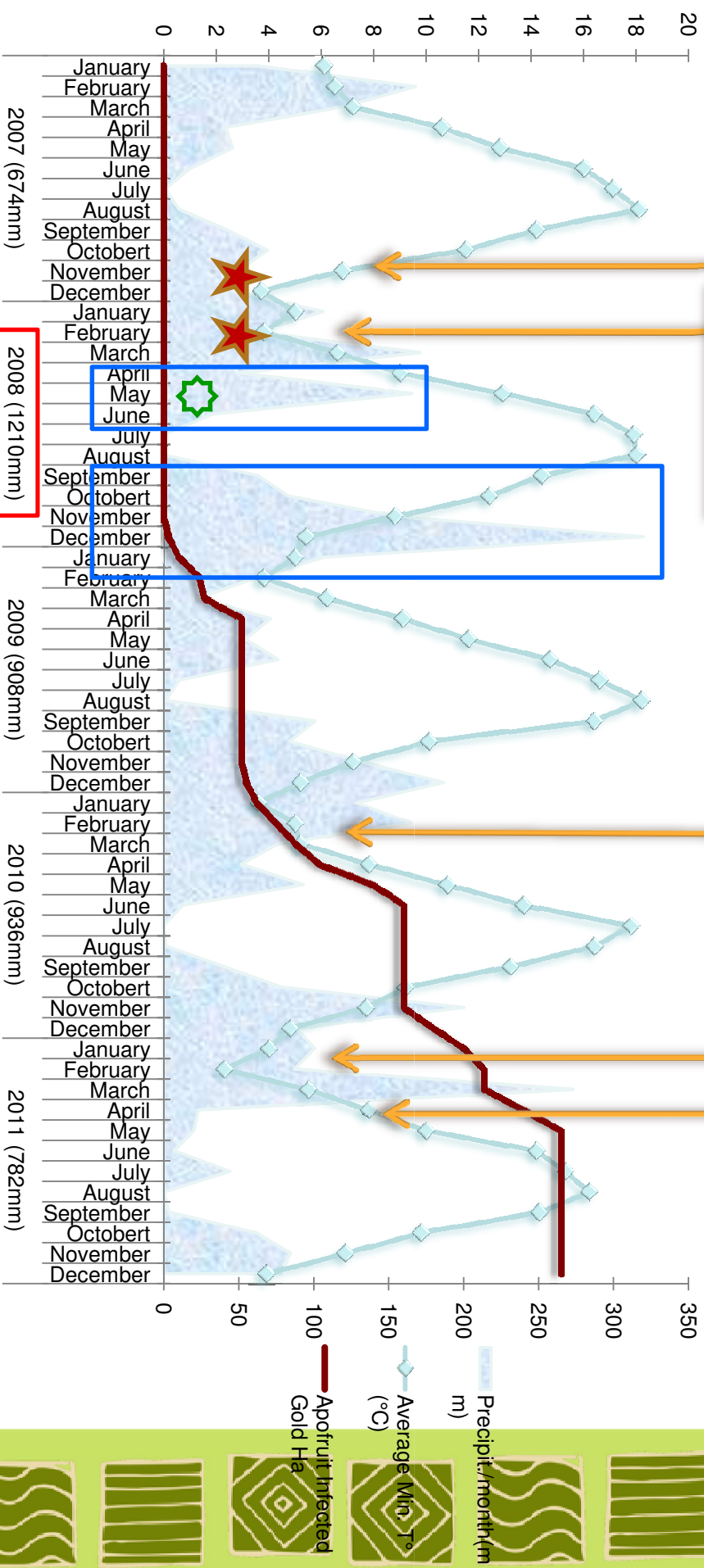
*Gelata
autunale:
4-5/11/2007

*Gelata
invernale:
17/02/2008

*Gelata
invernale:
1/02/2010

*Gelata fine
autunno:
17/12/2010

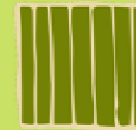
*Gelata fine
inverno:
8/03/2011



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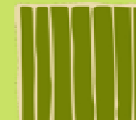
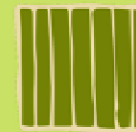
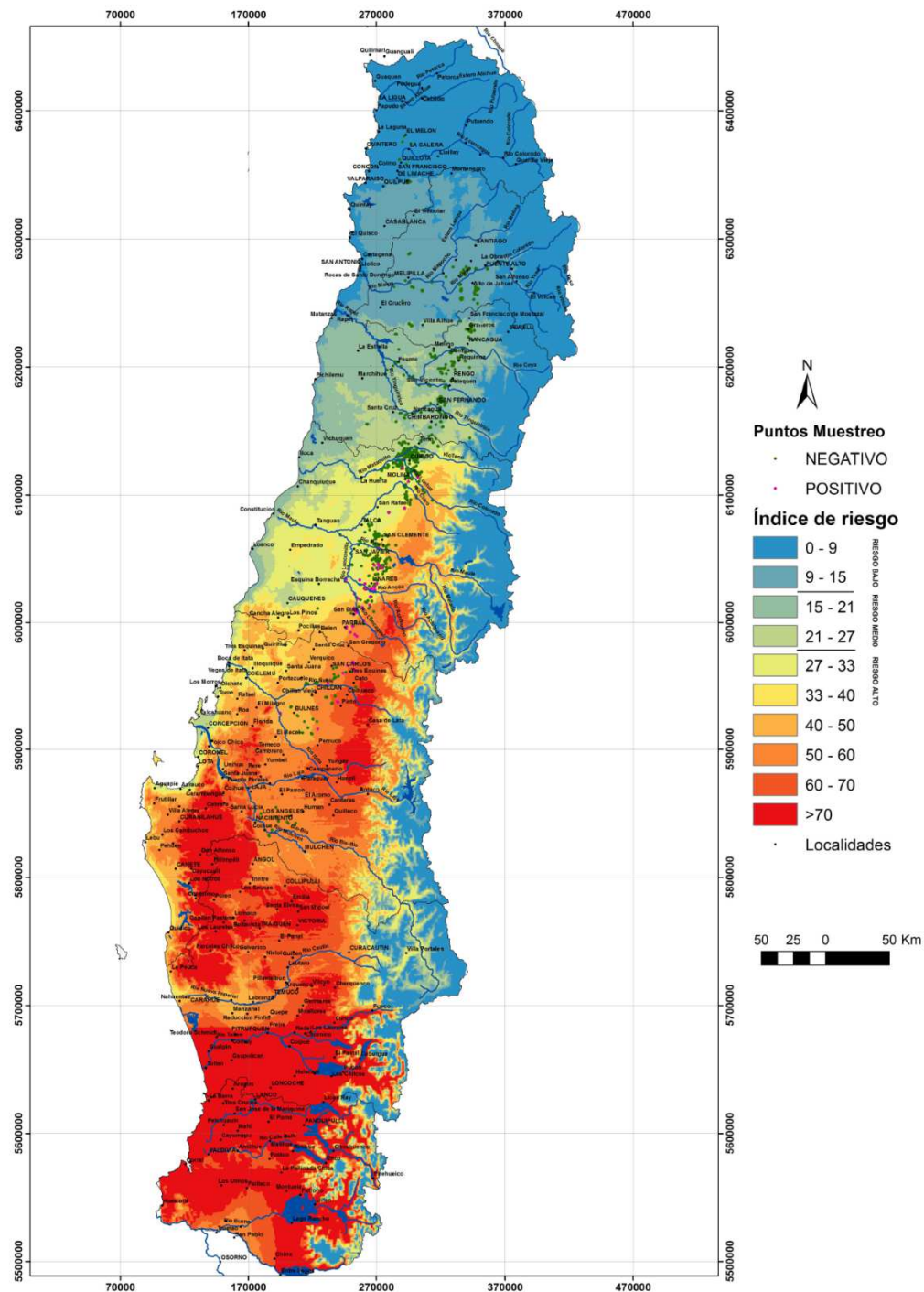
Il giorno dopo la gelata: estesa presenza di essudati (con PSA)





Indice di rischio per la comparsa di PSA in Cile in relazione alle basse temperature

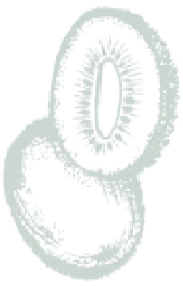
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Implicazioni della gestione idrica nella “moria del kiwi” del veronese

GIOVAMBATTISTA SORRENTI¹ - MORENO TOSELLI¹ - GIAMPIERO REGGIDORI² - FRANCESCO SPINELLI¹ - LORENZO TOSI³
ALESSIO GIACOPINI⁴ - GIANNI TACCONI⁵

¹Dipartimento di Scienze Agrarie - Università di Bologna

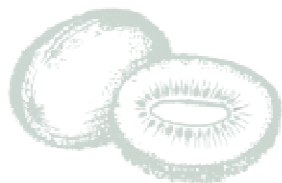
²Apoconerpo, Villanova di Castenaso (Bo)

³Agrea Centro Studi (Vr)

⁴Mercato Ortofrutticolo di Bussolengo e Pescantina (Vr)

⁵Crea, Genomics Research Centre - Fiorenzuola d'Arda (Pc)

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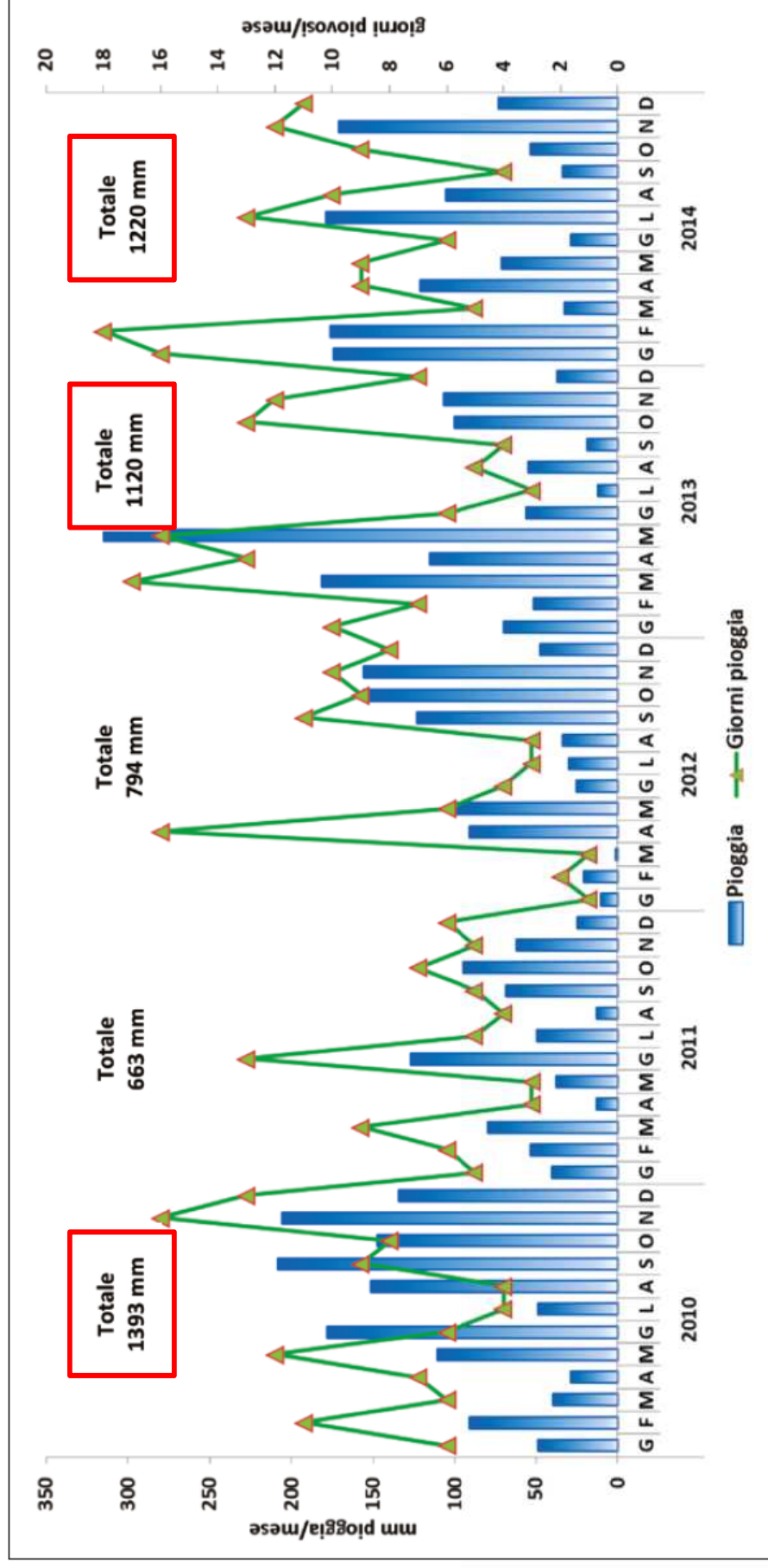
Struttura del terreno

**TABELLA 1 - Contenuto (%)
in argilla, limo e sabbia
in un terreno con piante con
e senza moria del kiwi**

	Tipo di terreno		
	argilloso	limoso	sabbioso
Con moria	28,2	39,5	32,3
Senza moria	13,6	20,4	66,0

Nei terreni argillo-limosi si è riscontrato un numero maggiore di piante colpite da moria.

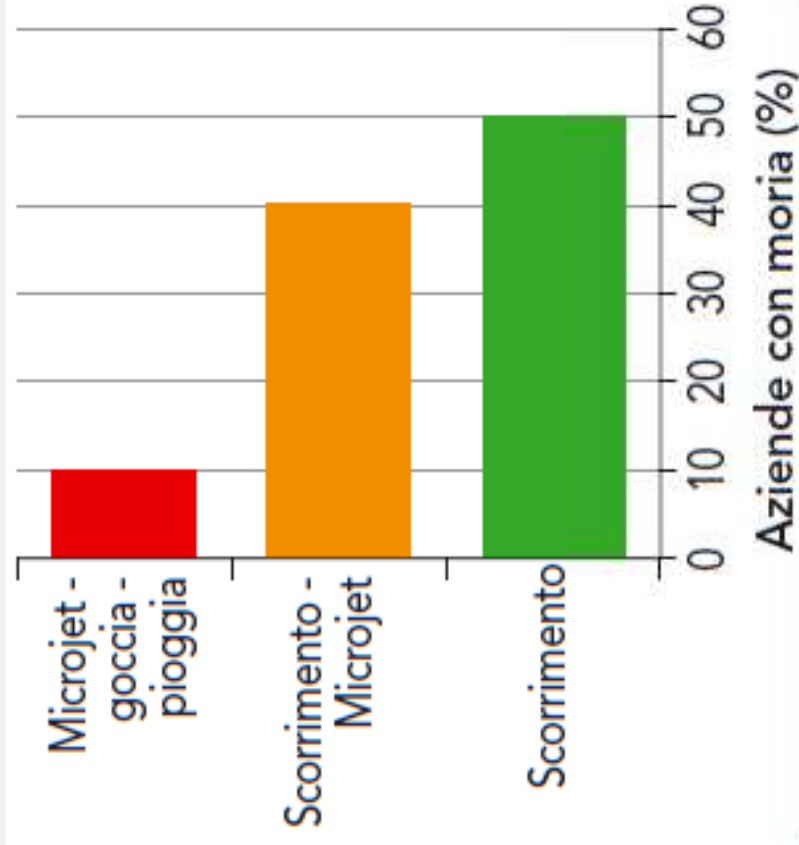




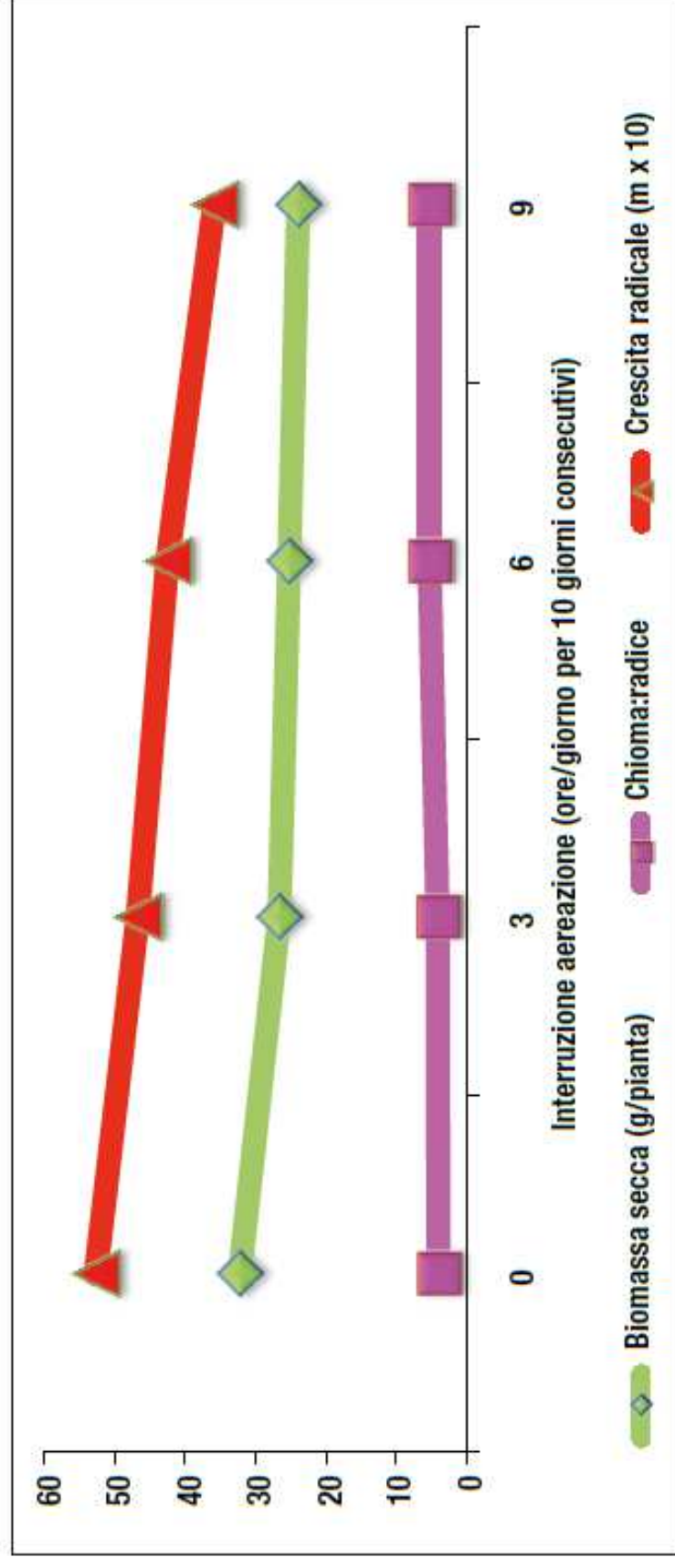
▲ Fig. 2 - Piovosità (mm pioggia e giorni piovosi) registrata negli ultimi 5 anni nell'areale di coltivazione del kiwi del veronese (dati registrati dalla stazione meteo di Villafranca Veronese (Vr)).



GRAFICO 1 - Tipo di irrigazione e moria del kiwi



L'indagine condotta ha evidenziato che dove viene utilizzato il sistema a scorrimento, da solo o in associazione con microjet, la moria delle piante di kiwi ha un'incidenza maggiore.

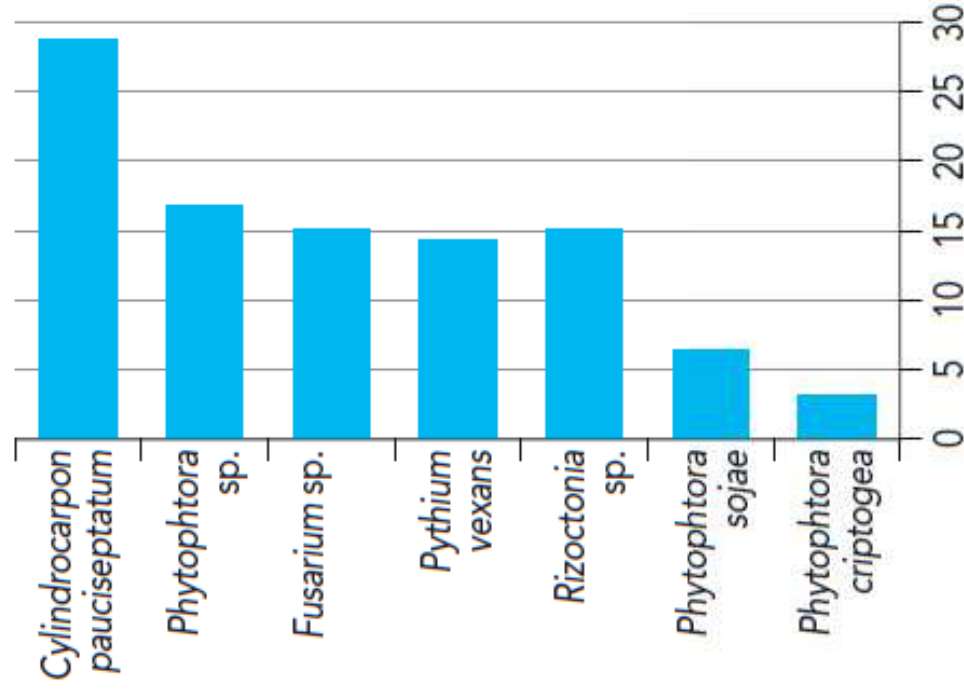


▲ Fig. 4 - Effetto dell'asfissia indotta (ore/giorno per 10 giorni consecutivi) sull'accumulo di biomassa secca, rapporto chioma:radice e lunghezza delle radici di *Actinidia deliciosa* (cv. Hayward) in coltura idroponica (adattato da Smith et al., 1989).



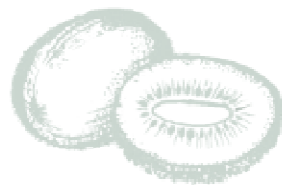
▲ Fig. 7 - Apparato radicale di actinidia evidentemente sofferente (scarsa presenza di radici bianche primarie, sintomi di imbrunimento) nella porzione inferiore al piano di campagna, probabilmente legati a fenomeni di anossia.





Funghi isolati da radici sintomatiche (%)

La presenza di funghi patogeni in piante sintomatiche non ha fatto emergere correlazioni significative tra la moria e uno specifico patogeno.



GRAZIE PER LA CORTESE ATTENZIONE !

