GdL ACTINIDIA

MACFRUT 2022

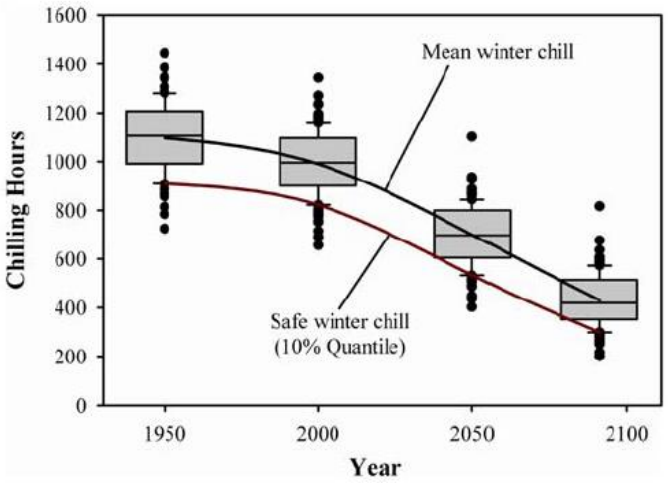
GIORNATA TECNICA
Venerdì 6 Maggio 2022
MACFRUT 2022 - Fruit & Veg Professional Show
Rimini - Expo Centre - Sala Neri 1

IL KIWI IN ITALIA:
limiti produttivi, opportunità e internazionalizzazione

VOCAZIONALITA' CLIMATICA

Cristos Xiloyannis
Coordinatore del GdL SOI Actinidia

TEMPERATURE/FABBISOGNO IN FREDDO



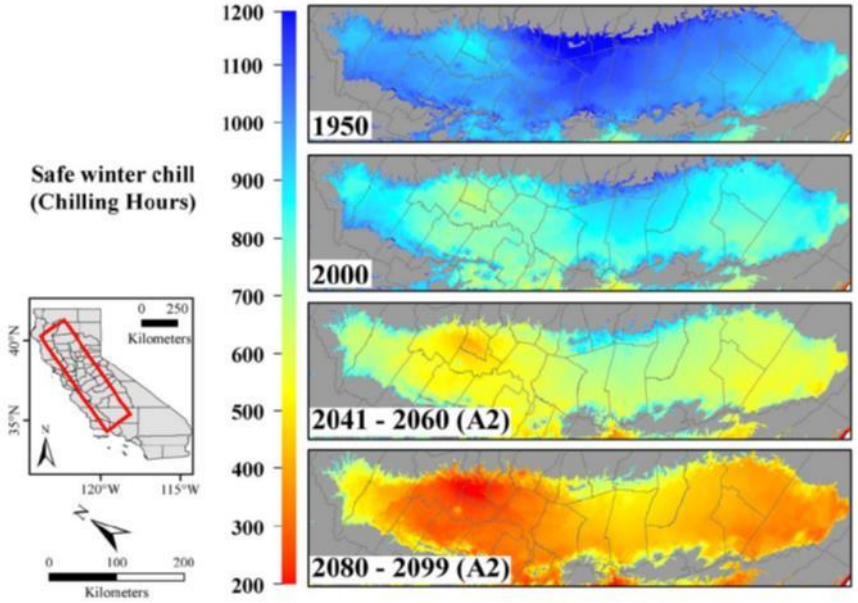


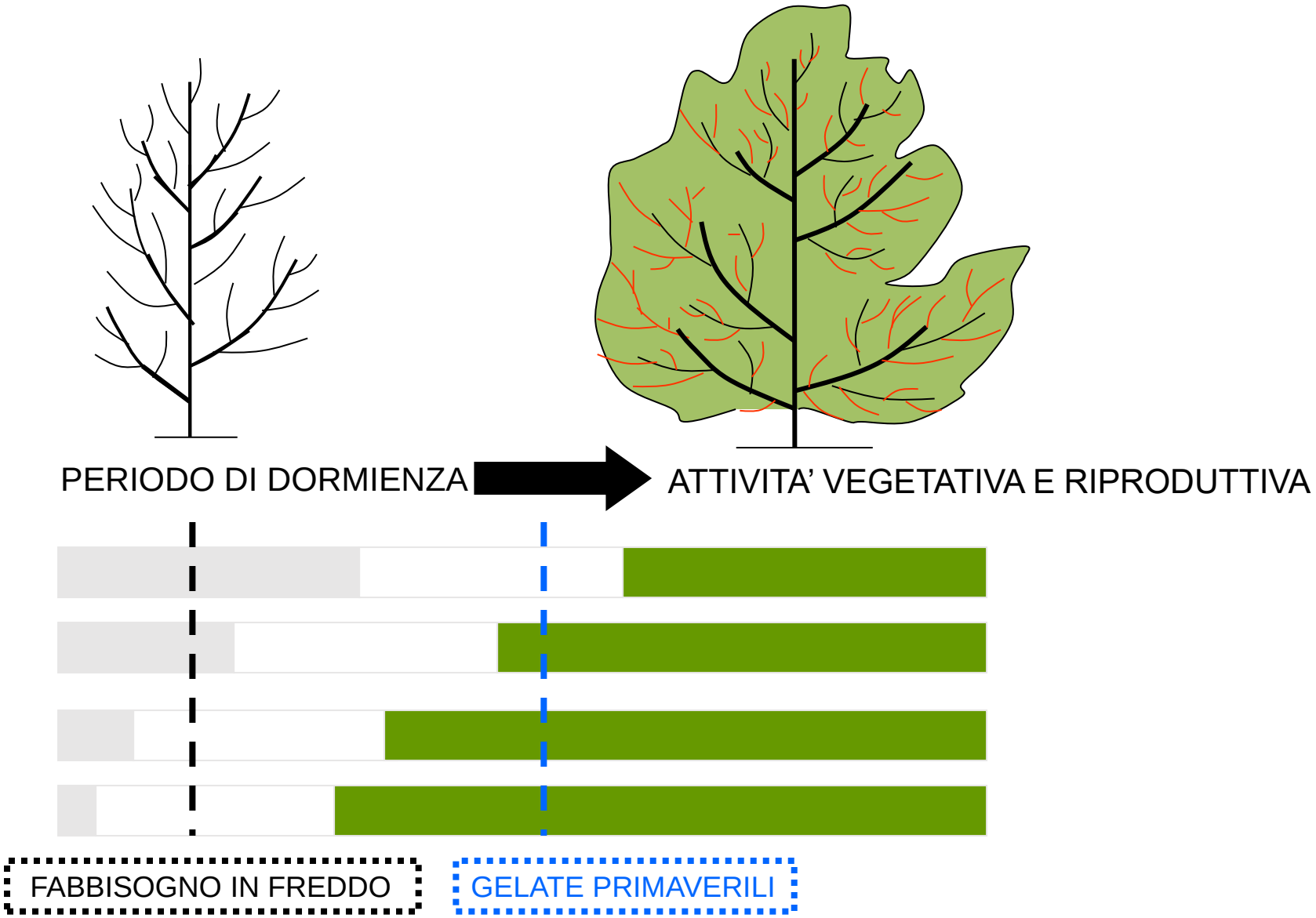
Figure 3. Safe winter chill in California's Central Valley in 1950, 2000, 2041–2060 and 2080–2099, calculated with the Chilling Hours Model. Future winter chill was quantified using the A2 IPCC greenhouse gas emissions scenario.
doi:10.1371/journal.pone.0006166.g003

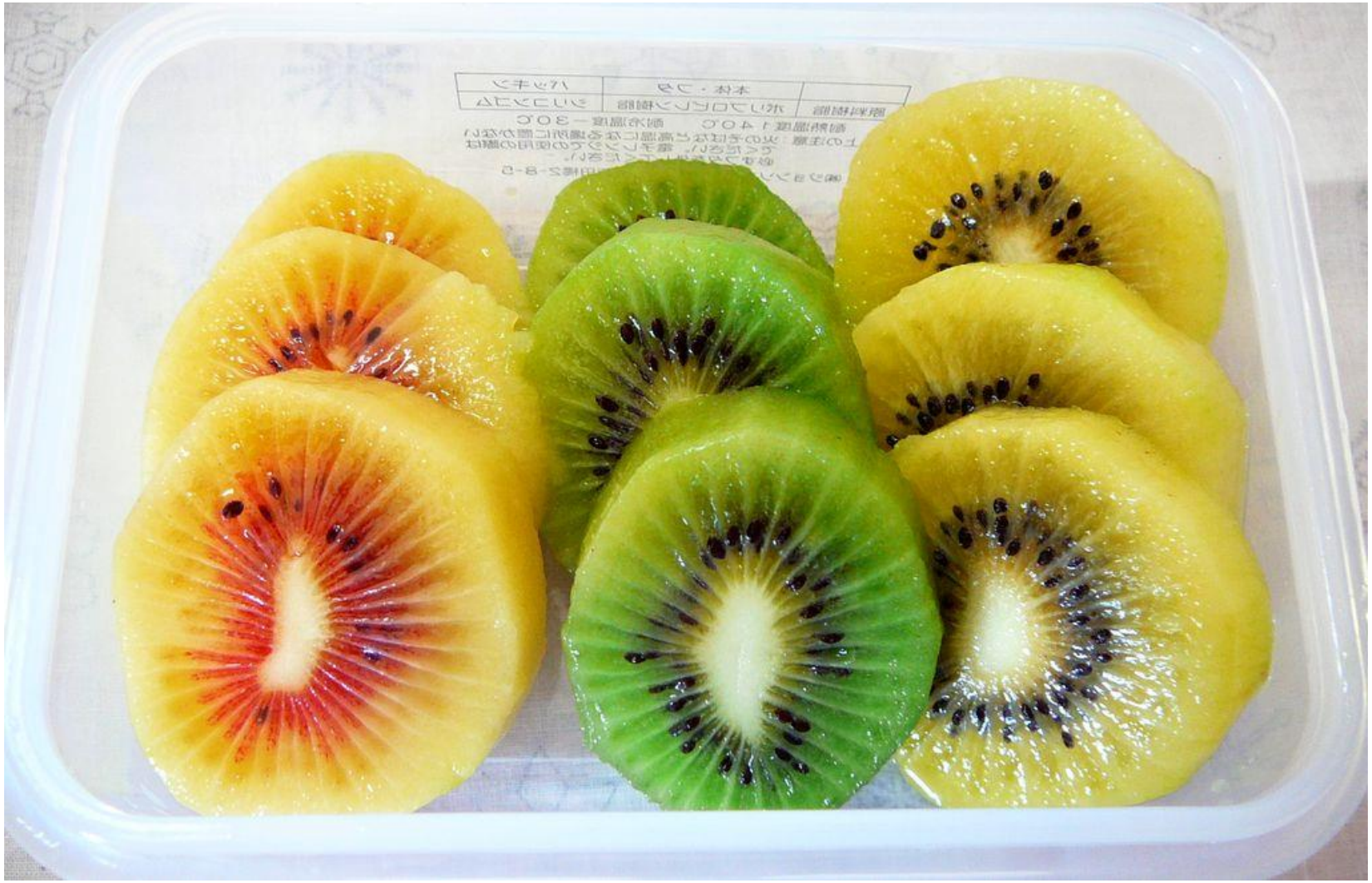
Previsione di riduzione dell'accumulo delle ore <u>in freddo ….</u>

OPEN ACCESS Freely available online PLoS one

Climatic Changes Lead to Declining Winter Chill for Fruit and Nut Trees in California during 1950–2099

Eike Luedeling[1,2*], Minghua Zhang[1*], Evan H. Girvetz[3]


PERIODO DI DORMIENZA
ATTIVITA' VEGETATIVA E RIPRODUTTIVA
FABBISOGNO IN FREDDO
GELATE PRIMAVERILI

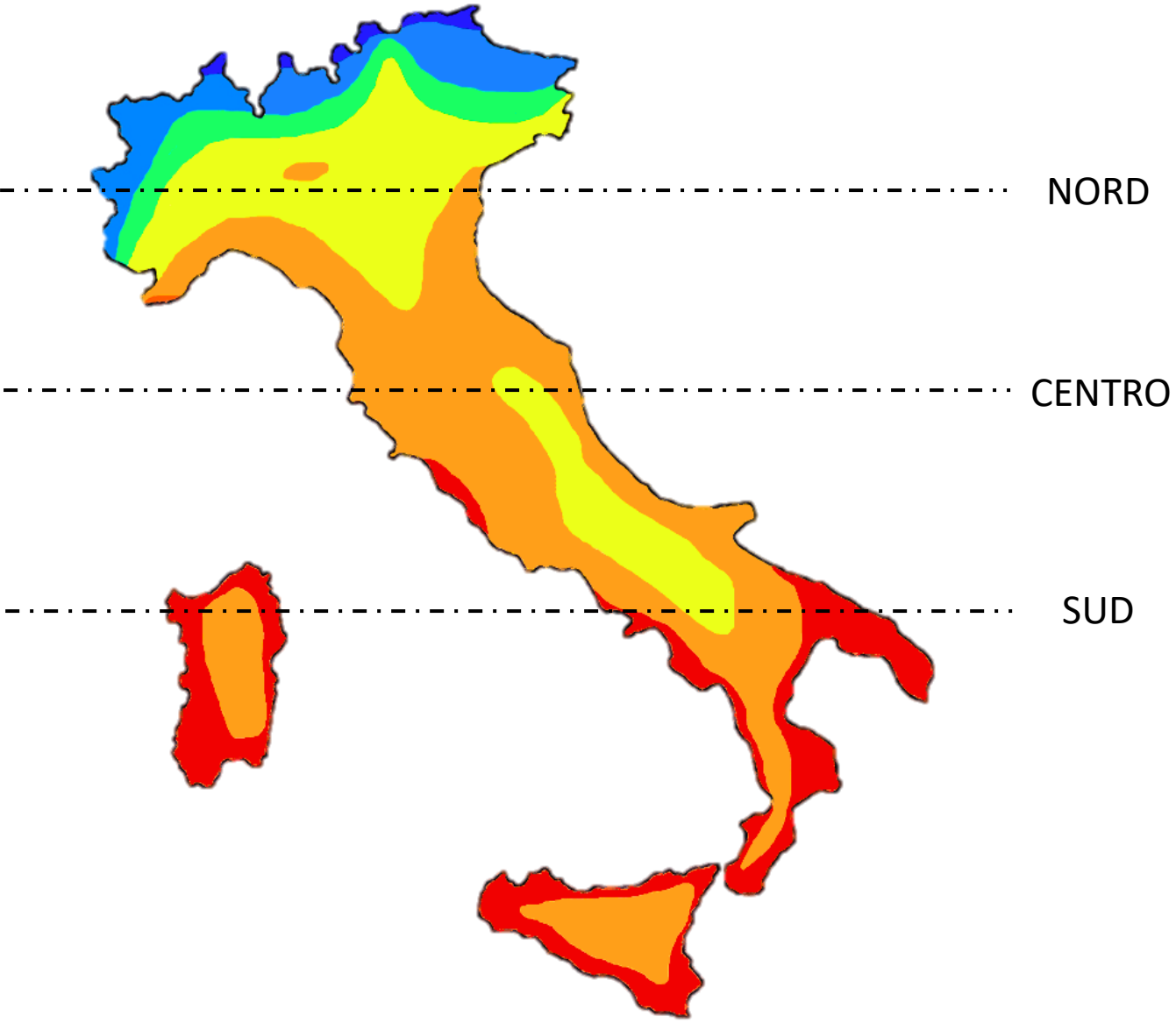


ESIGENZE IN FREDDO

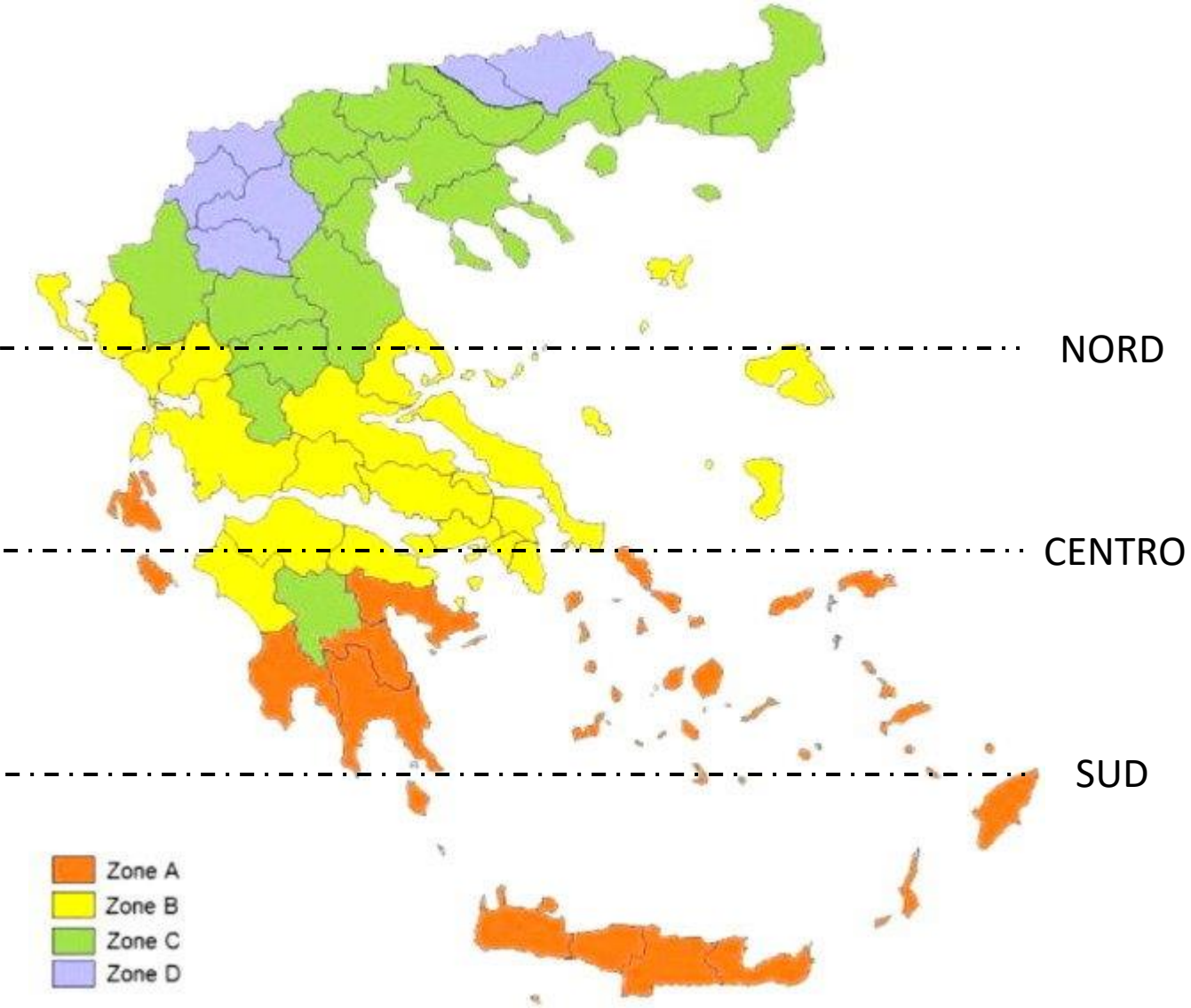
- **Ac. Deliciosa (a polpa verde) 800-900 ore**

- **Ac. Chinensis 400-800 (a polpa gialla)**

- **Ac. Chinensis (rosso/giallo, rosso/verde) 300-500?**



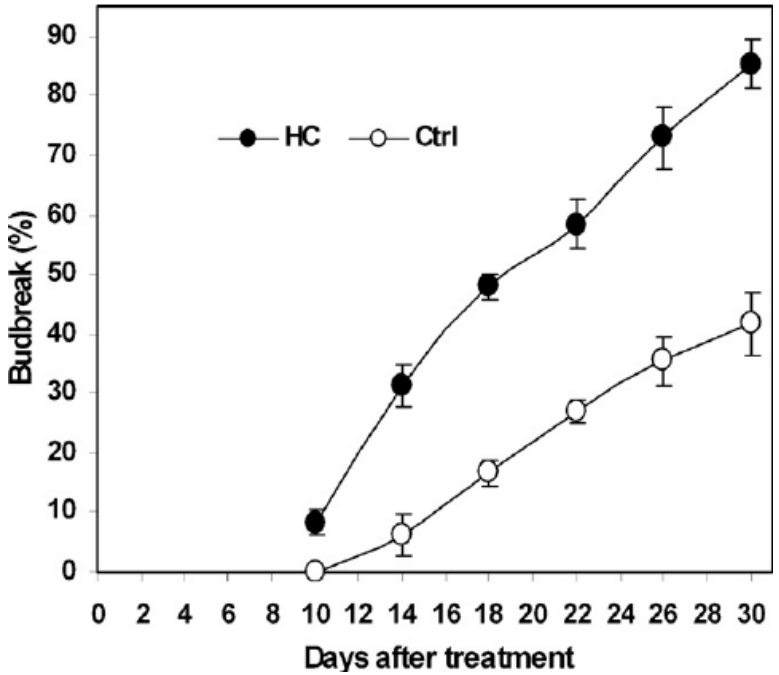
	KIWI VERDE	KIWI GIALLO	KIWI ROSSO
Accumulo ore di freddo	+++	+++	+++
Rischio GELATE	medio	alto	alto
Accumulo ore di freddo	++	+++	+++
Rischio GELATE	basso	medio	alto
Accumulo ore di freddo	+	+++*	+++
Rischio GELATE	nessuno	basso	medio



	KIWI VERDE	KIWI GIALLO	KIWI ROSSO
Accumulo ore di freddo	+++	+++	+++
Rischio GELATE	medio	alto	alto
Accumulo ore di freddo	++	+++*	+++
Rischio GELATE	basso	medio	alto
Accumulo ore di freddo	+	++	+++
Rischio GELATE	nessuno	basso	medio

Climatic zones in Greece
by Nikos Papamanolis

IDROGENO CIANAMMIDE



Illegale in ITALIA e Europa sulle colture

Temporaneamente ammesso in Grecia
in via emergenziale (2021)

Utilizzato in NZ (con restrizioni, fuori mercato
Fra 4-5 anni?)

Foto solo di esempio d’uniformità di produzione. Fruitbookmagazine.it

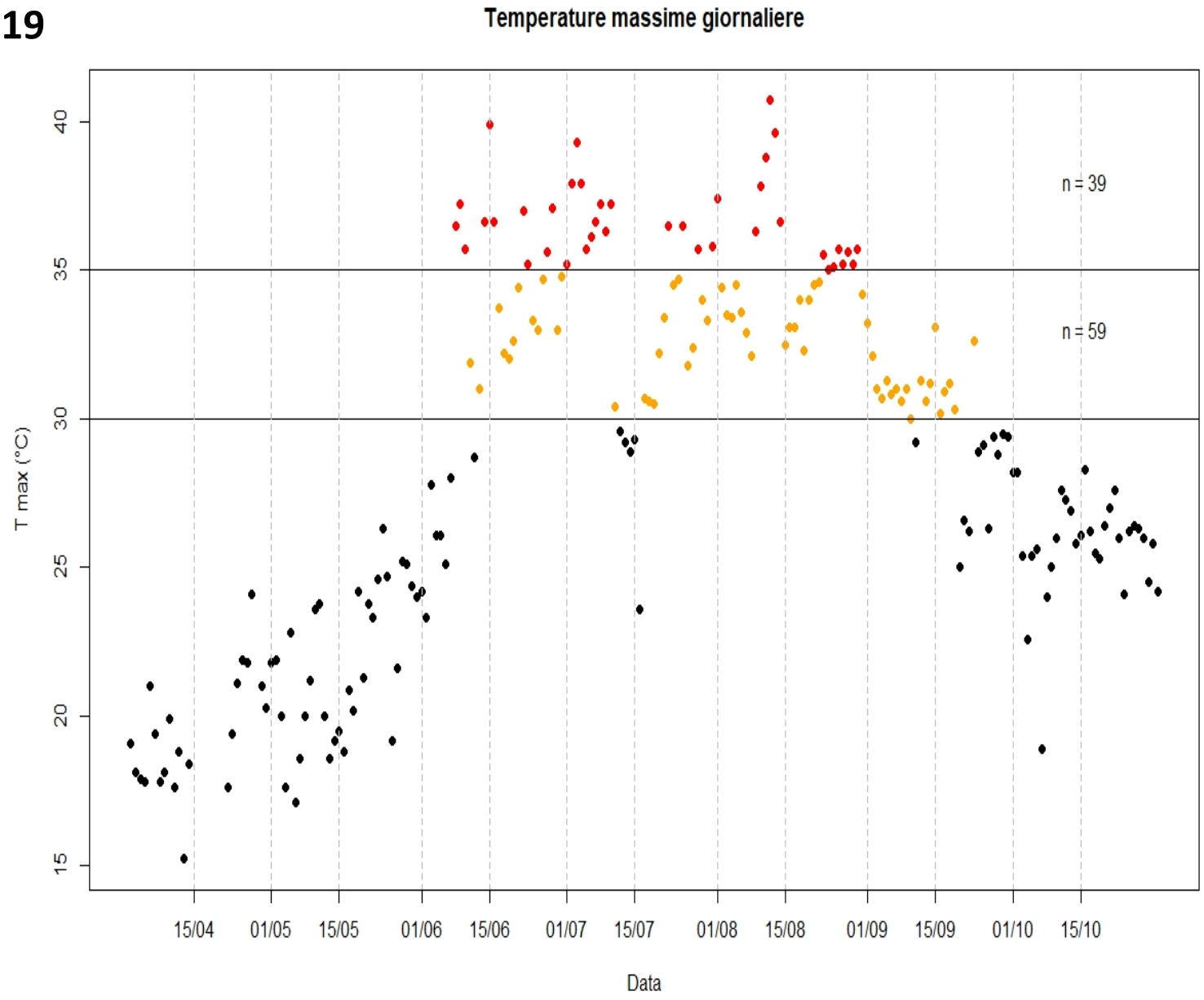
4) DANNI DA GELATA PRIMAVERILE SU GERMOGLI DI ACTINIDIA

Freshplaza

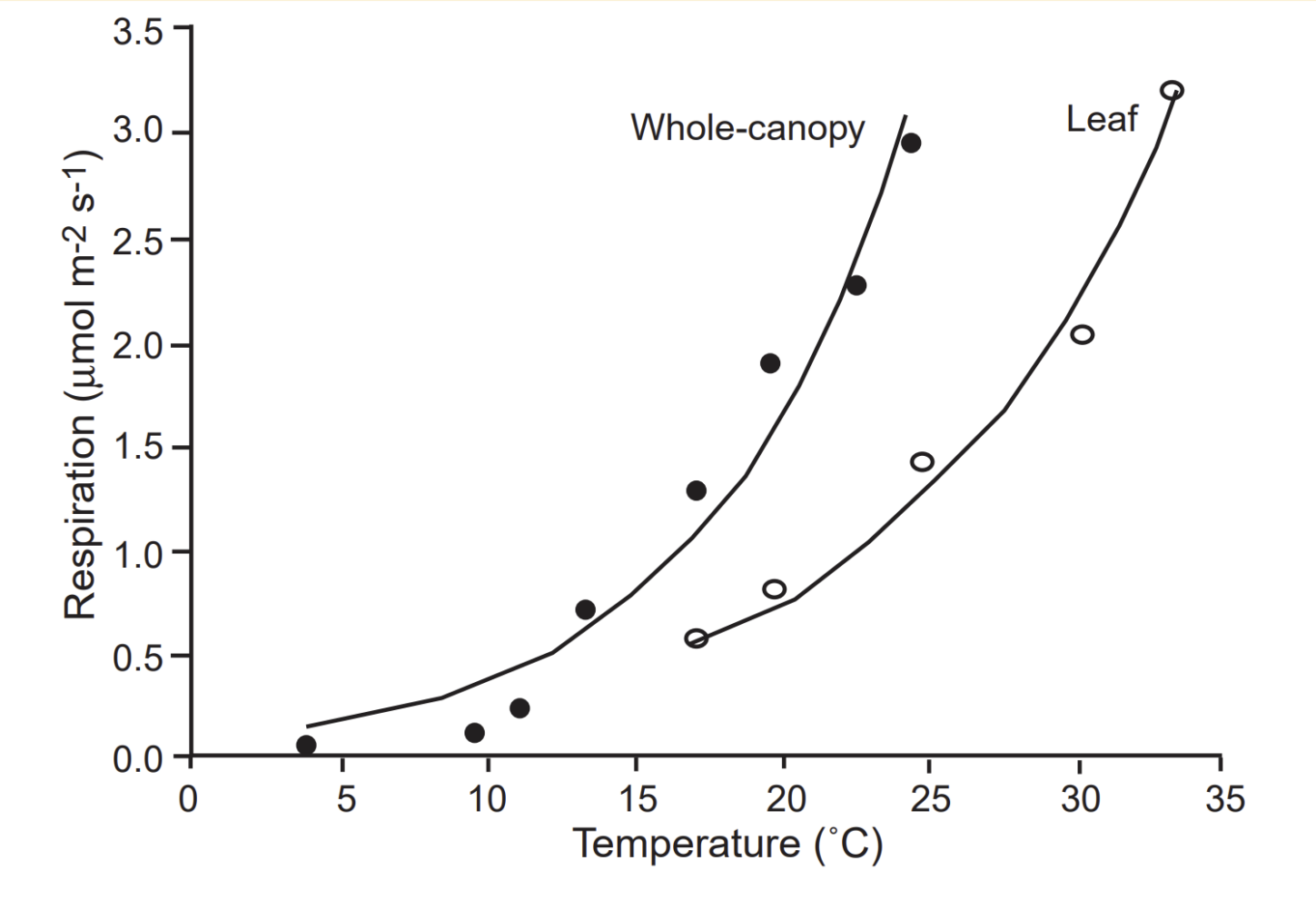
Freshplaza

….ruolo antibrina dell’irrigazione

METAPONTO BASILICATA
2019



Effect of temperature on leaf and whole-canopy respiration of Braeburn apple trees.



https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.523.4691&rep=rep1&type=pdf

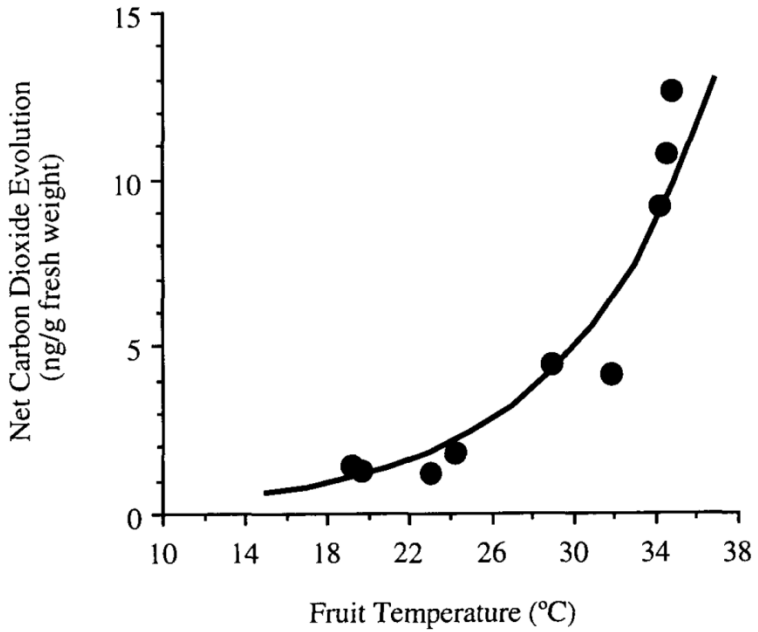
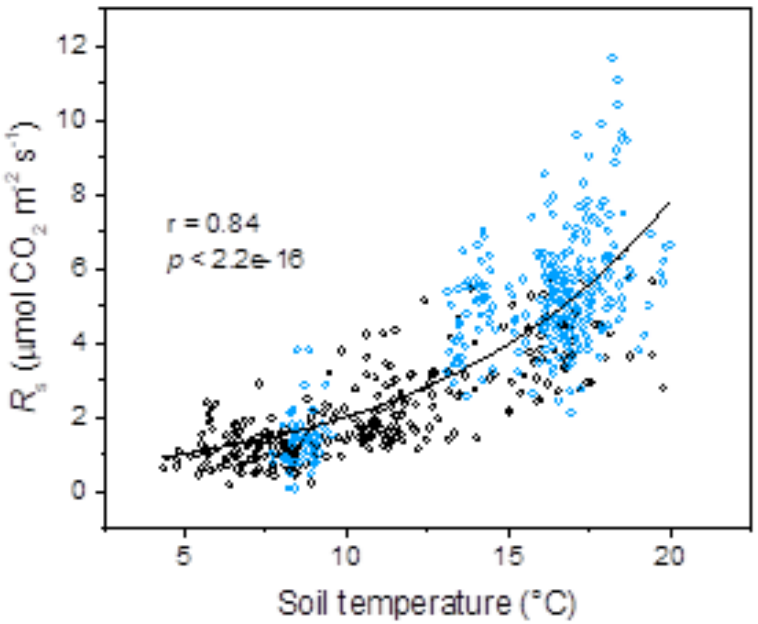
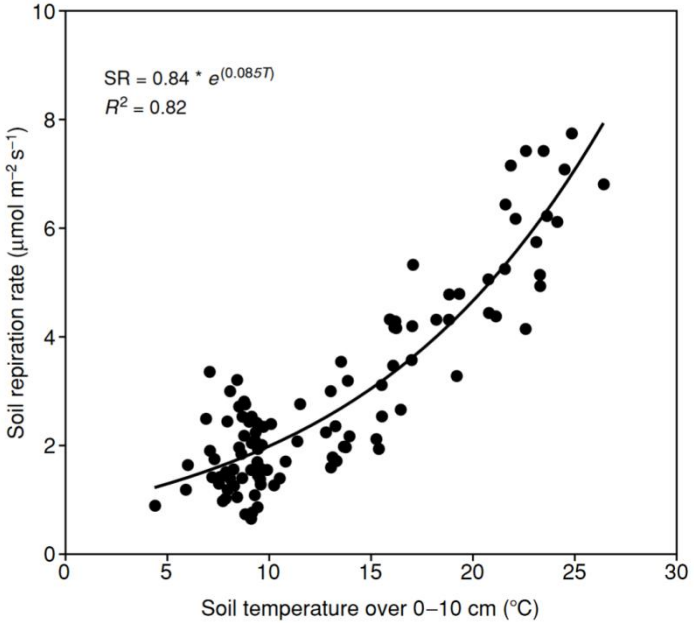


Figure 3. Temperature response curve for fruit dark respiration on attached fruit under controlled conditions. Fruit averaged 32 mm in diameter. The equation for the response curve is: $Y = 0.0695\ (10^{0.614X})$; $R^2 = 0.92$; where Y = NCE and X = temperature of fruit.

Bepete, M. and Lakso, A.N. (1997).
DOI: 10.17660/ActaHortic.1997.451.37
https://doi.org/10.17660/ActaHortic.1997.451.37

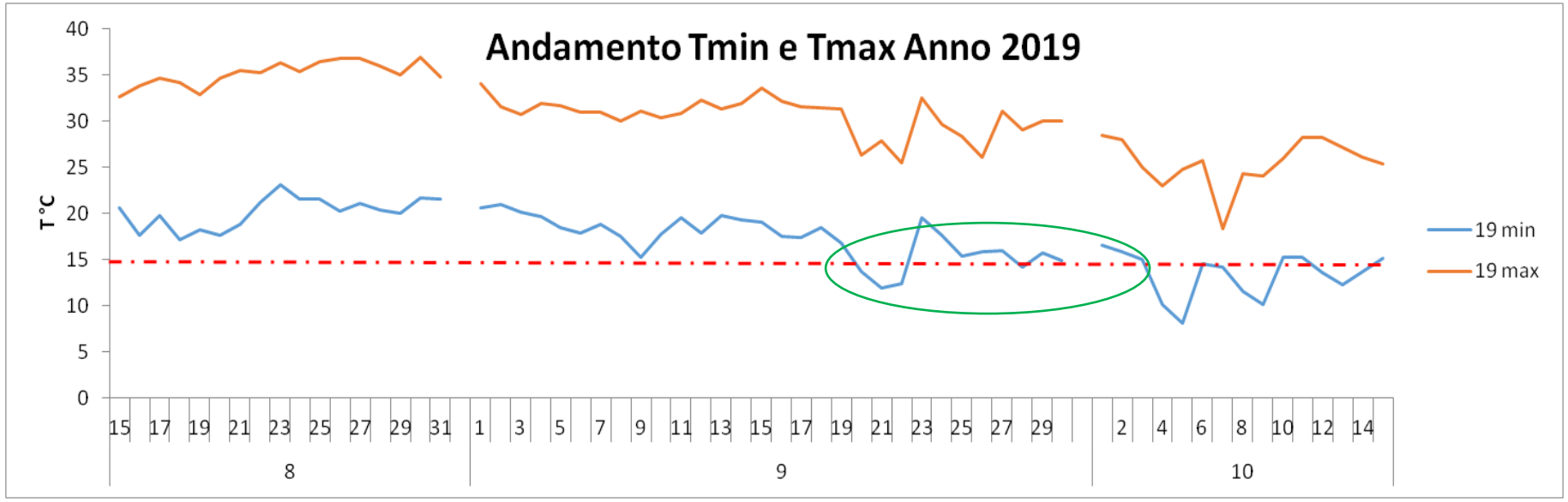


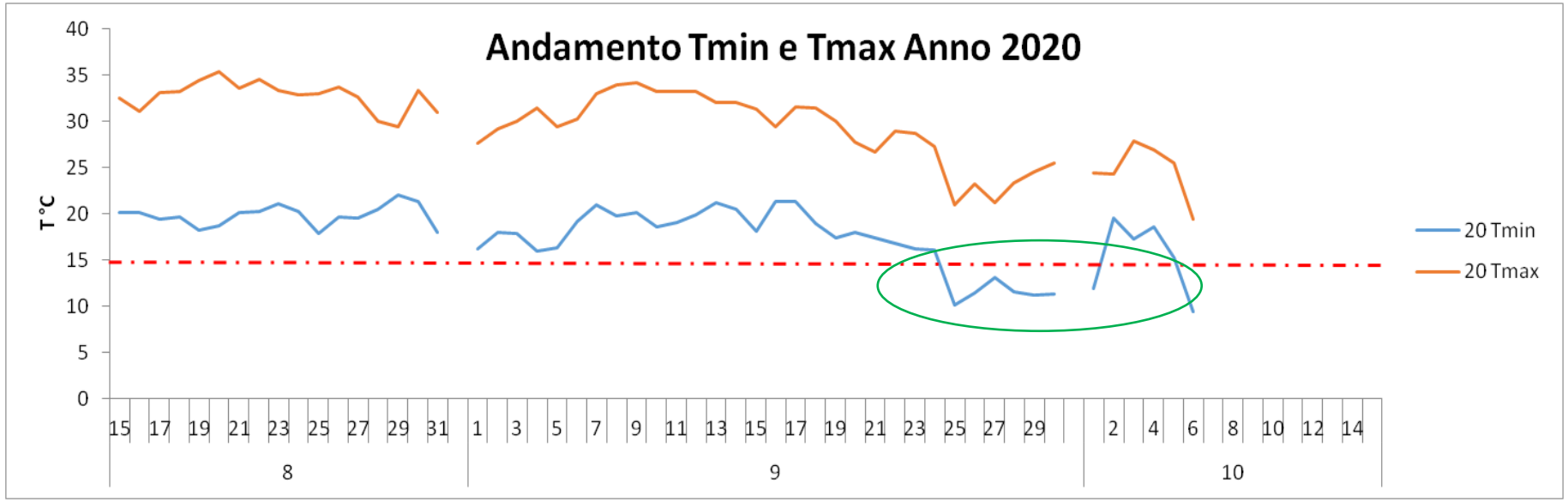
Oliveto, in preparazione



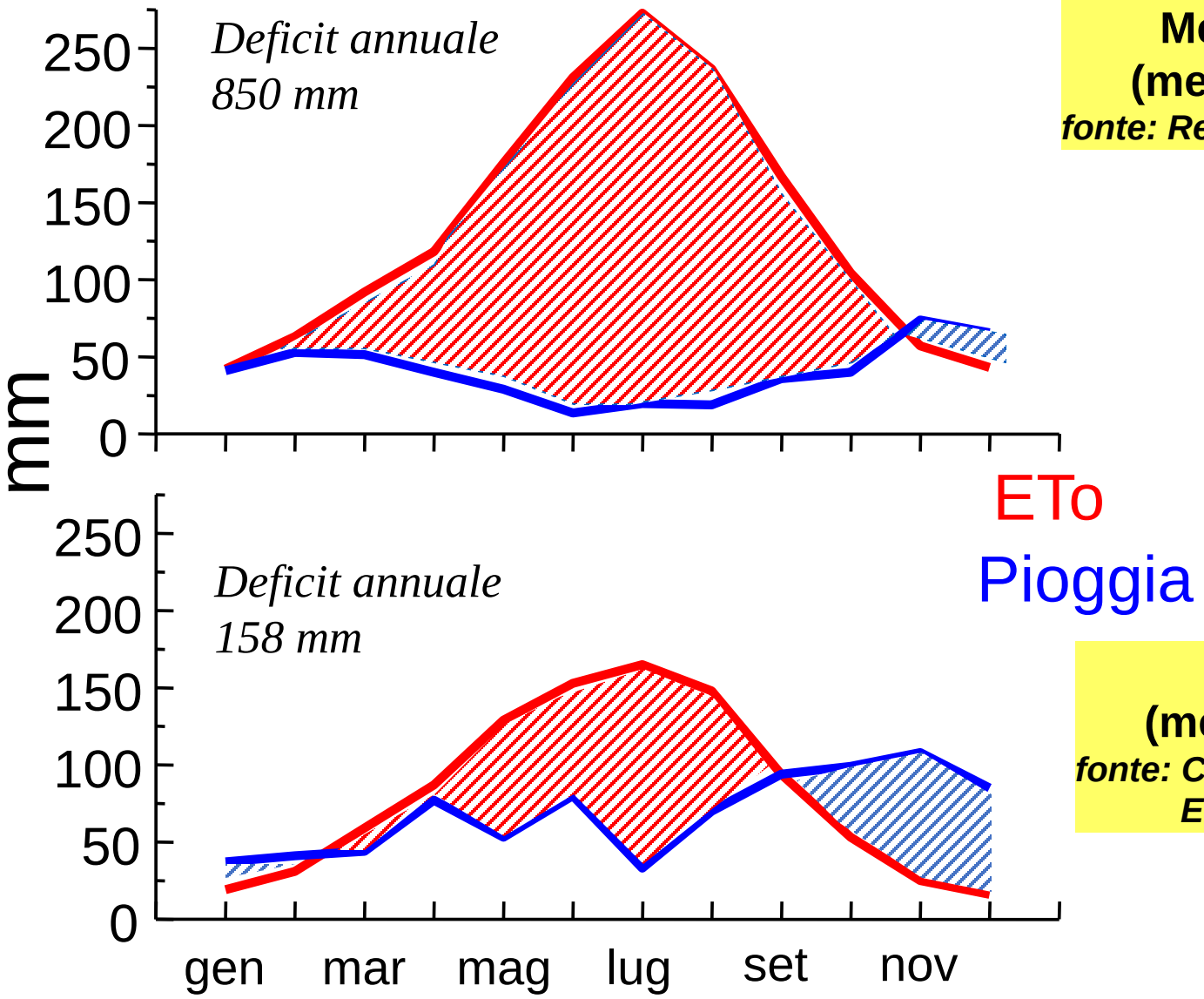
forest Quercus spp. soil
Global Change Biology (2002) 8, 851±866

Andamento climatico in BASILICATA (15 agosto – 15 ottobre)





PIOGGIA/ETo



Metapontino
(media 20 anni)
fonte: Reg. Basilicata

Cesenate
(media 10 anni)
fonte: Cons. Bonif. Canale Emiliano Romagnolo

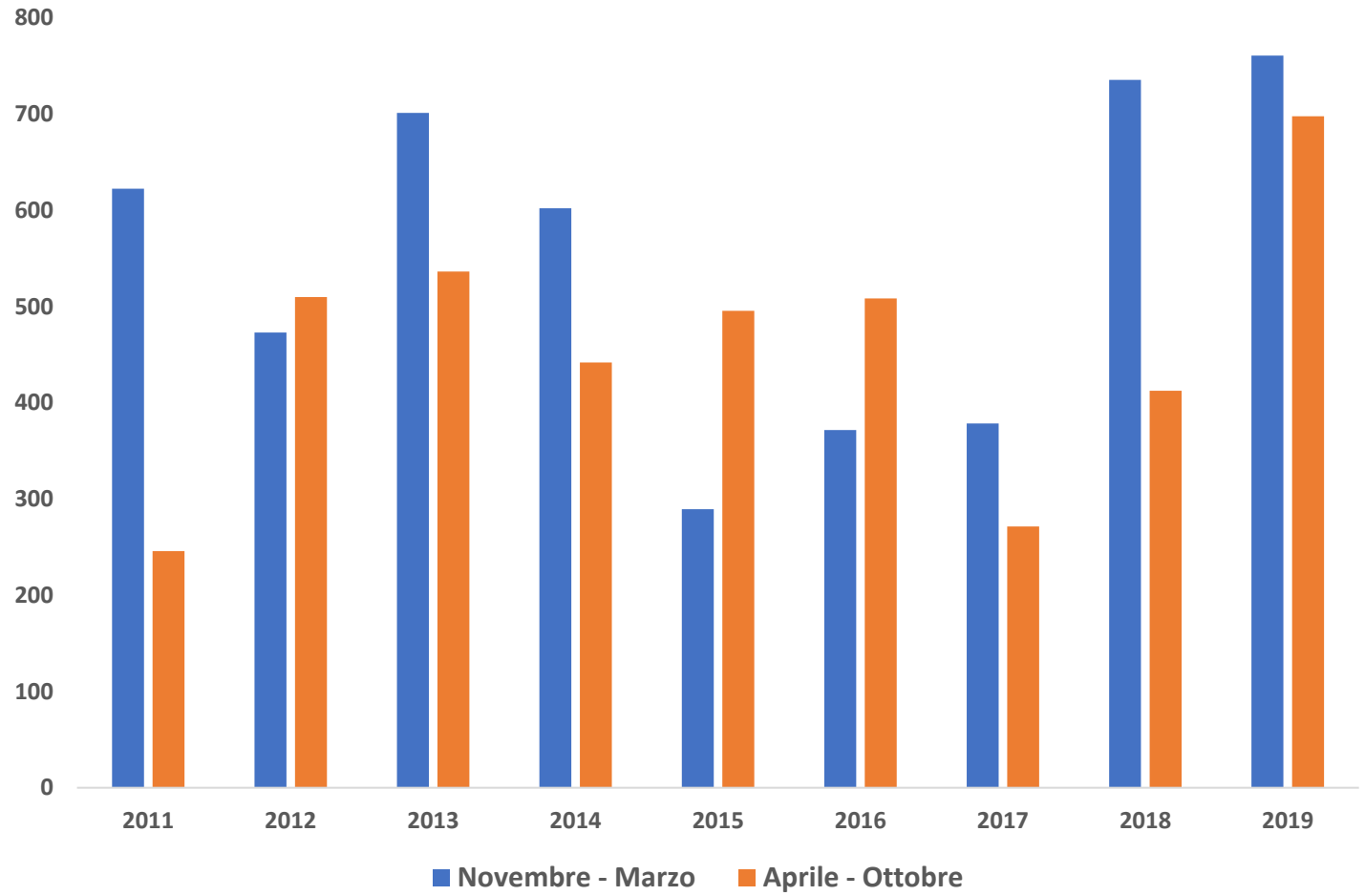
Riepilogo storico 2011-2019

Periodi di piovosità (Nov – Mar | Apr – Ott)

Provincia di Latina

Centraline Apofruit – sistema Econet

	2011	2012	2013	2014	2015	2016	2017	2018	2019
	868 mm	**983 mm**	**1238 mm**	**1044 mm**	**785 mm**	**880 mm**	**650 mm**	**1148 mm**	**1459 mm**
Novembre - Marzo	622,46	473,07	701,29	602,18	289,46	371,63	378,57	735,50	760,80
Aprile - Ottobre	245,93	509,87	536,41	441,85	495,50	508,37	271,45	412,50	697,80

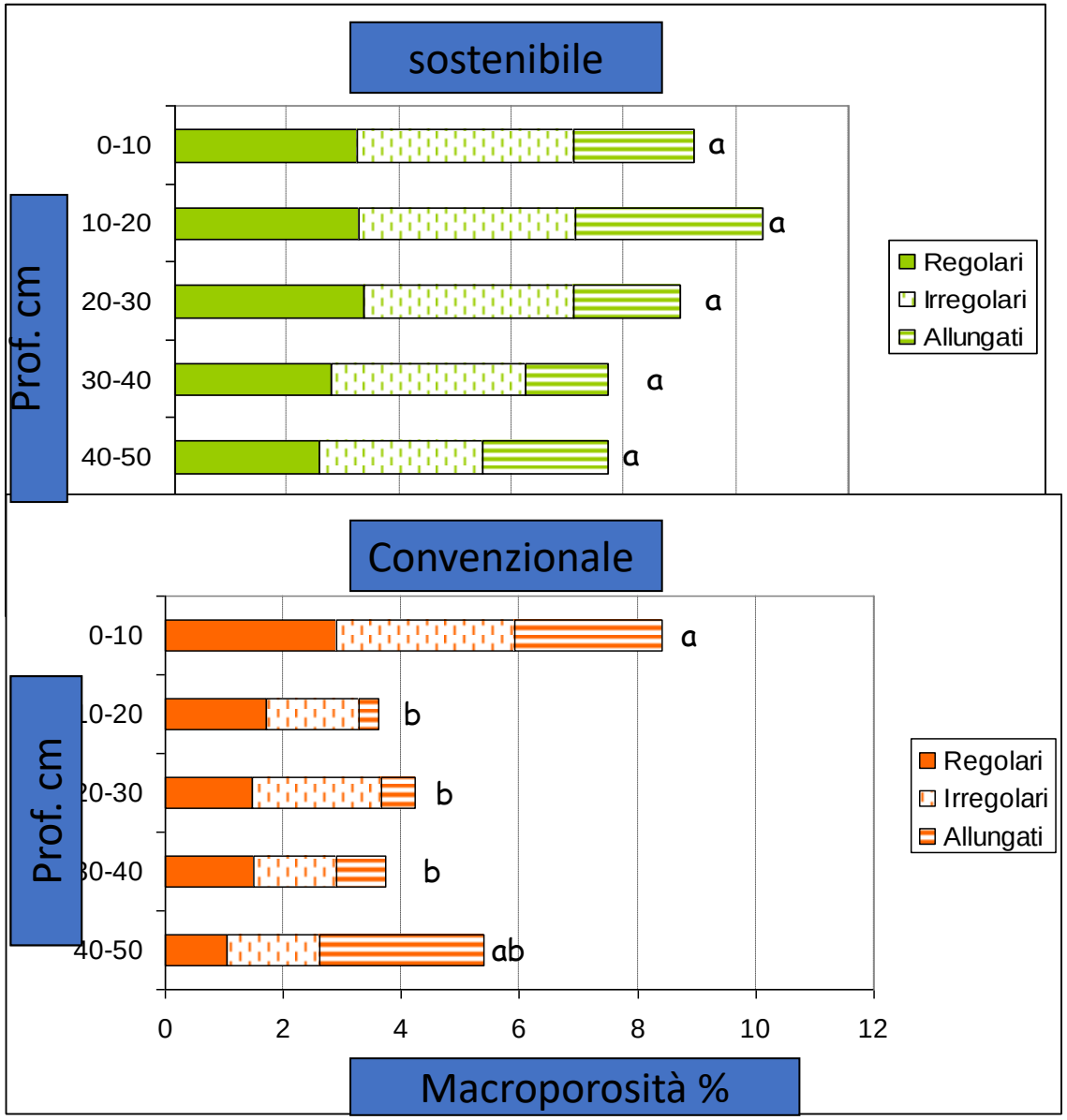


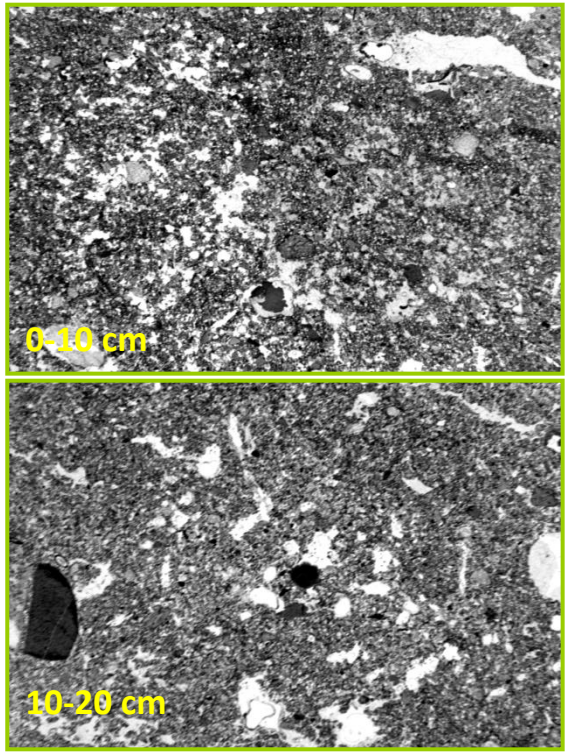
Contenuti di sali dell'acqua irrigua da pozzi ed apporti in aziende calabresi

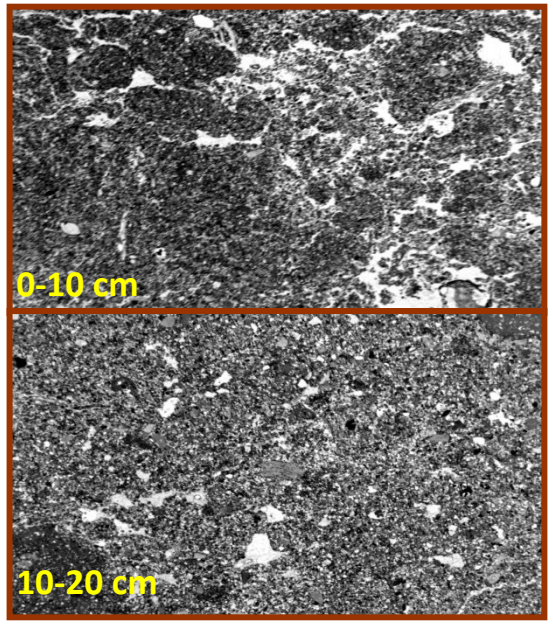
Apporto di Sali

	mg/L					kg/ha/anno			
		az. 1	az. 2	az. 3	az. 4		az. 1	az. 2	az. 3	az. 4
colruri		19.9	15.3	73.8	56.7		167.2	128.5	619.9	476.4
azoto da nitrati		3.4	3.2	9.9	3.2		28.5	26.9	83.3	26.9
solfati		45.1	43.8	212.0	56.6		378.8	367.9	1,780.8	475.8
sodio		17.0	21.0	80.0	29.0		142.8	176.4	672.0	243.4
potassio		7.5	3.9	6.9			63.0	32.8	58.0	0.0
magnesio		19.4	12.2	31.6	18.0		163.0	102.5	265.4	150.9
calcio		52.1	68.1	188.4	82.4		437.6	572.0	1,582.6	692.2
bicarbonati		225.0	255.0	342.0	280.6		1,890.0	2,142.0	2,872.8	2,357.0

Macroporosità in diverse profondità in due suoli dopo 10 anni di gestione diversa.







Piante di actinidia con forti sintomi di disseccamento e perdita di foglie dovuti al ristagno idrico osservate durante l’estate 2013 nel Veronese.

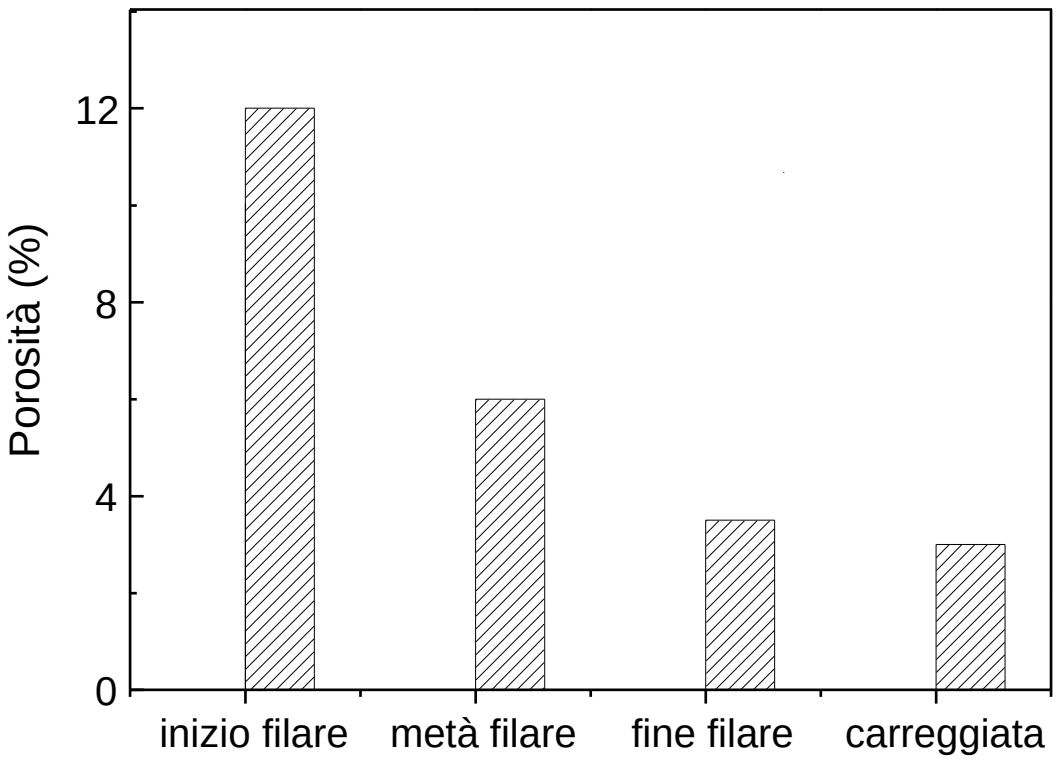


Figura 3 – Effetto dell' irrigazione per scorrimento sulla porosità del terreno osservata in vari punto lungo il filare ed in corrispondenza della carreggiata. La porosità è espressa come percentuale di area occupata dai pori maggiori di 30 μm di diametro per sezione sottile. (Rielaborata da Pezzarossa et al., 1991 e Xiloyannis et al., 1992).

Volume di suolo esplorato dalle radici di pesco (cv Vega innestata su due portinnesti, m 4,5 x 1,25) e di actinidia (cv Hayward, m 4,5 x 3,0) nei primi quattro anni dall'impianto

	m^3/albero				m^3/ha			
ANNI	1°	2°	3°	4°	1°	2°	3°	4°
"MISSOUR"	1,22	3,39	3,60	3,60	2.168	6.024	6.575	6.575
"Mr.S. 2/5"	0,56	1,97	2,80	2,80	995	3.501	5.029	5.029
"Hayward"	0,13	0,83	1,35	1,41	96	614	399	1.041

LUCE/VENTO

Concentrazioni (%SS) ottimali nel frutto alla raccolta

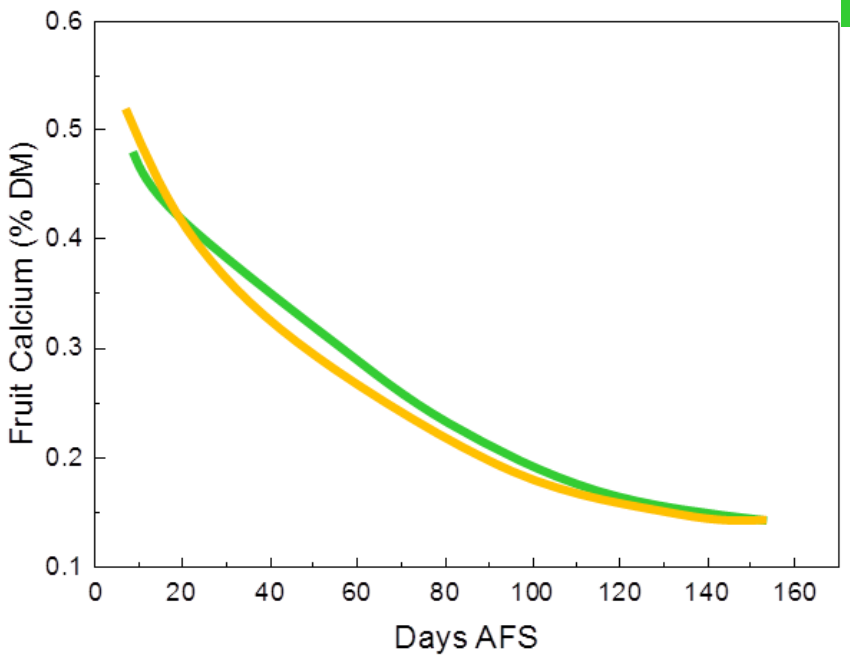
N	0.8 -1,1
P	0,15-0,20
K	1,2- 1,5
Ca	0,2-0,25
Mg	0,08-0,1

Montanaro et al., 2014

Mills et al., 2008

AGQ

Il calcio per il frutto



A. deliciosa

Montanaro et al., 2014

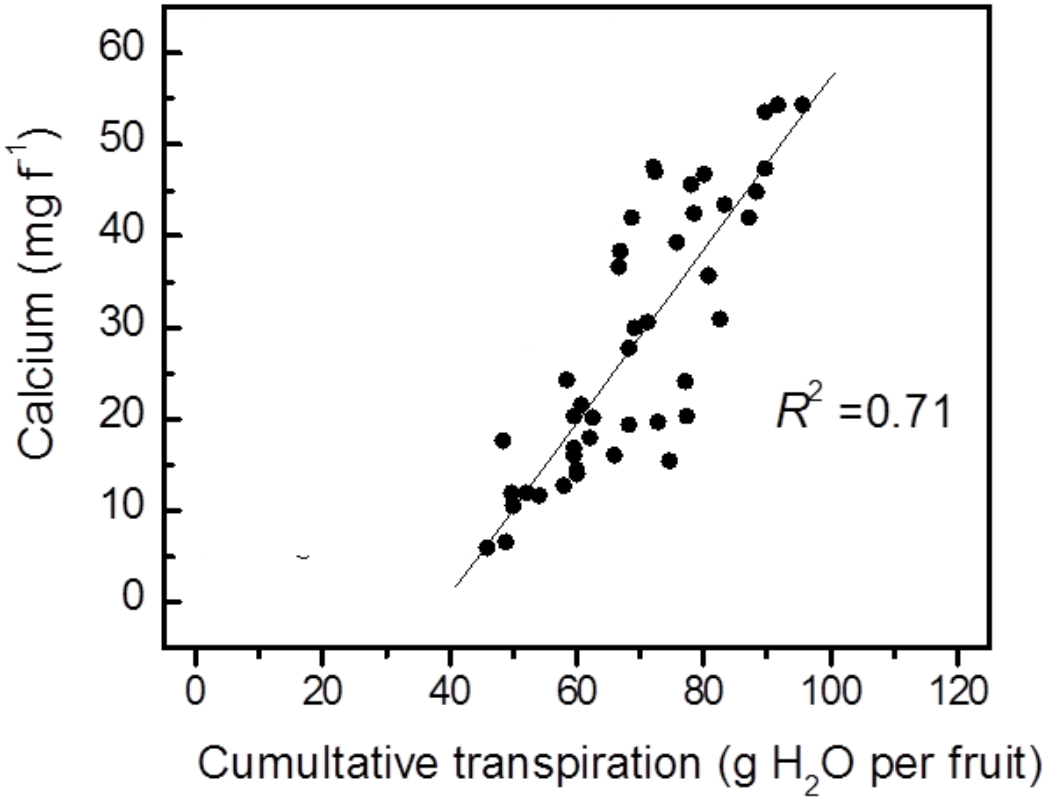
A. chinensis

Mills et al., 2008

Concentrazione di calcio nel frutto durante la stagione

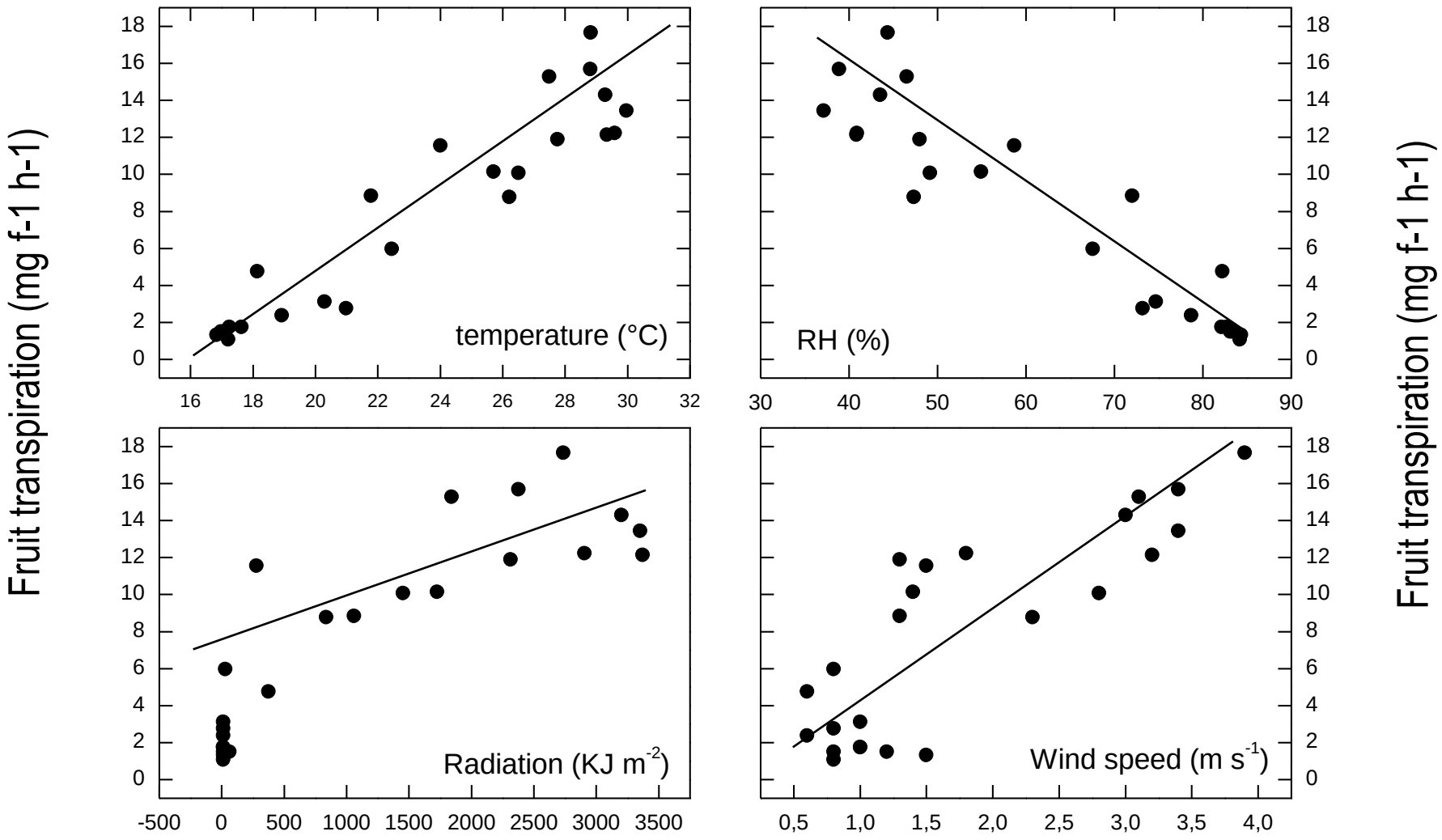
Il Calcio è ben correlato con la traspirazione dei frutti

VPD → Traspirazione → Calcio

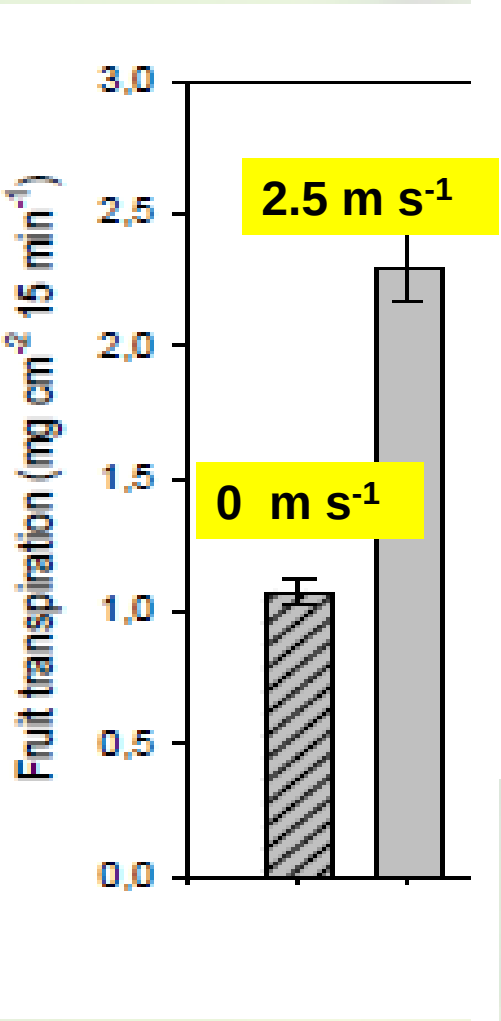


Fruit transpiration (mg f-1 h-1) in relation to different parameters (each point represents the average of 5-6 fruits)

June 15 2006 (23 DAFB)



Risposta della traspiraione dei frutti al vento nelle prime 7 settimane dopo allegagione



PHOTOSYNTHETICA 45 (4): 533-540, 2007

Response of photosynthetic machinery of field-grown kiwifruit under Mediterranean conditions during drought and re-watering

G. MONTANARO*, B. DICHIO, and C. XILOYANNIS

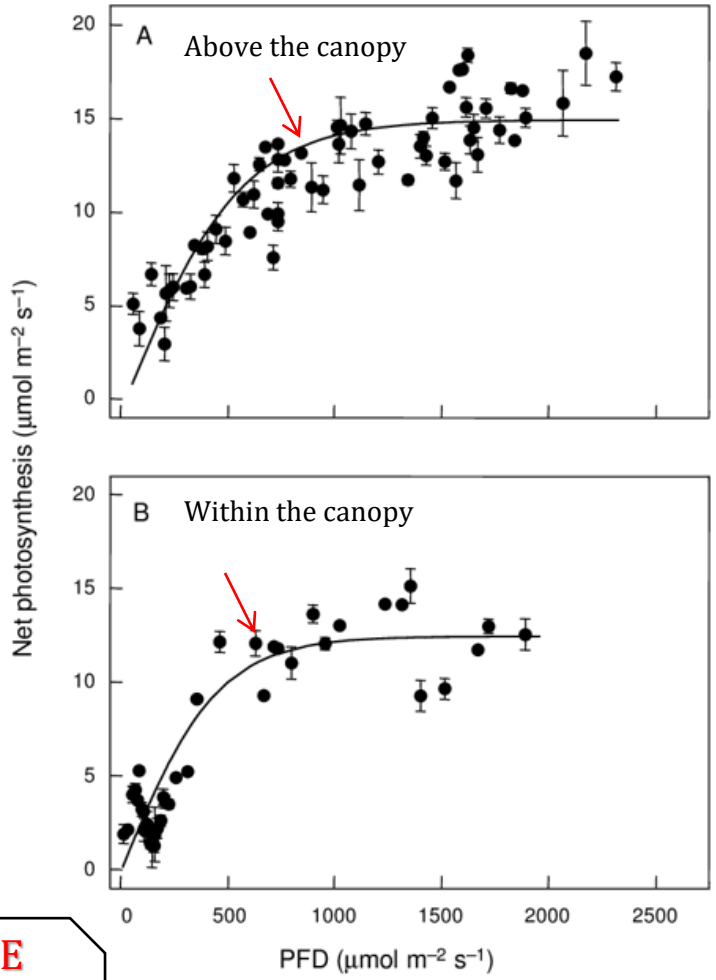
Department of Crop Systems, Forestry and Environmental Sciences, University of Basilicata, 85100 Potenza, Italy

PHOTOSYNTHETICA 47 (3): 363-371, 2009

Shade mitigates photoinhibition and enhances water use efficiency in kiwifruit under drought

G. MONTANARO*, B. DICHIO, and C. XILOYANNIS

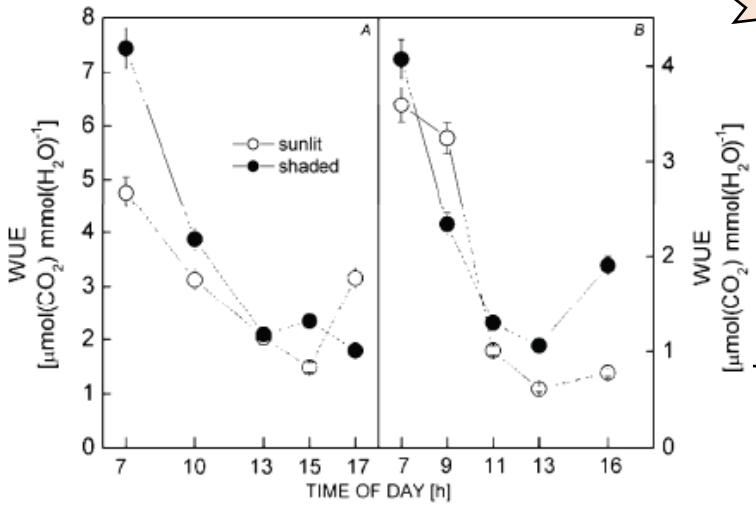
Department of Crop Systems, Forestry and Environmental Sciences, University of Basilicata, Viale dell'Ateneo Lucano, 10 - 85100 Potenza, Italy



La fotosintesi netta per foglie esposte alla luce raggiunge una soglia di saturazione intorno a 960 µmol m^{-2} s^{-1} PPF (Greer e Halligan, 2001).

↓

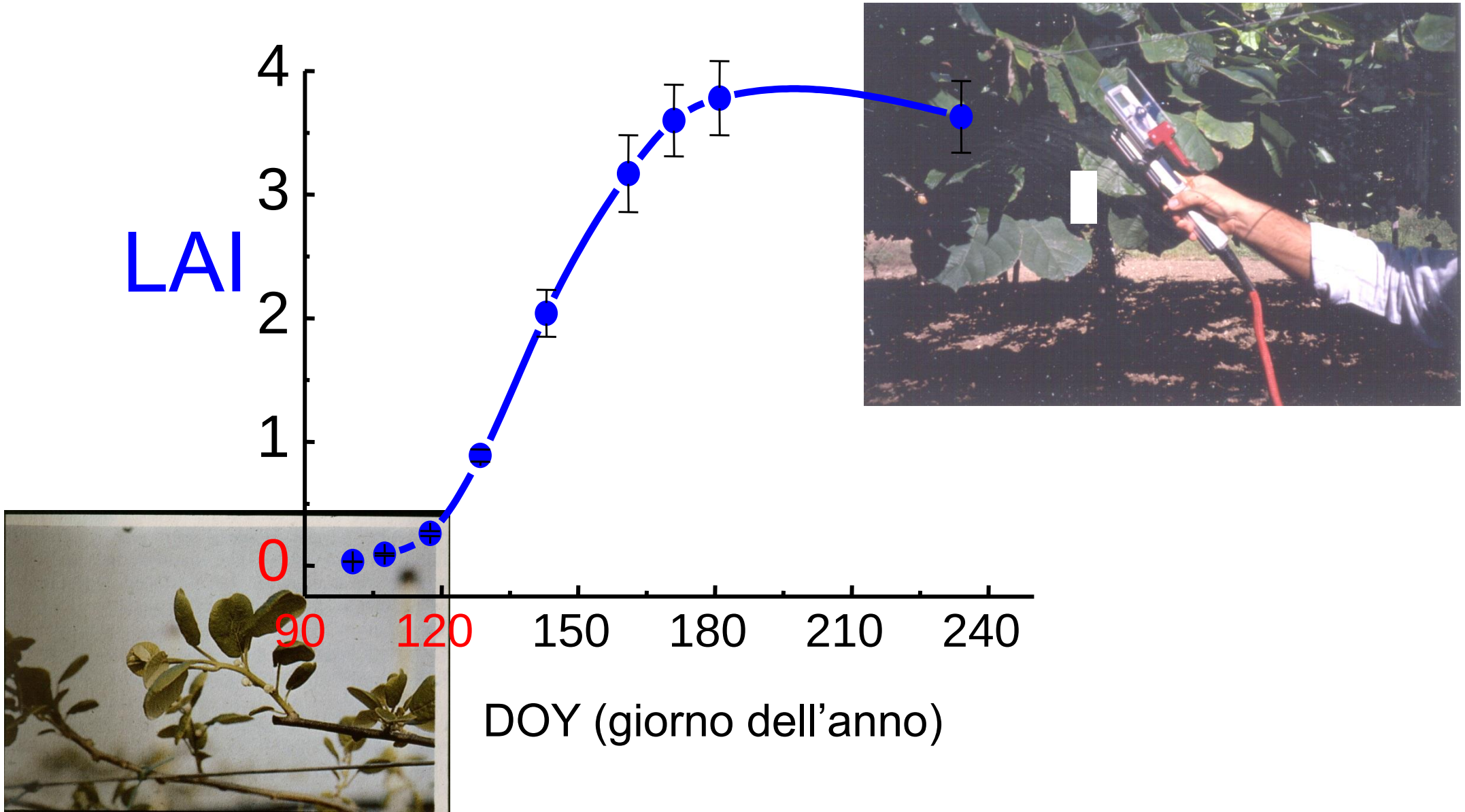
Durante l'estate l'irradianza può raggiungere valori giornalieri di 1 800–2 000 µmol m^{-2} s^{-1} PPFD per diverse ore.



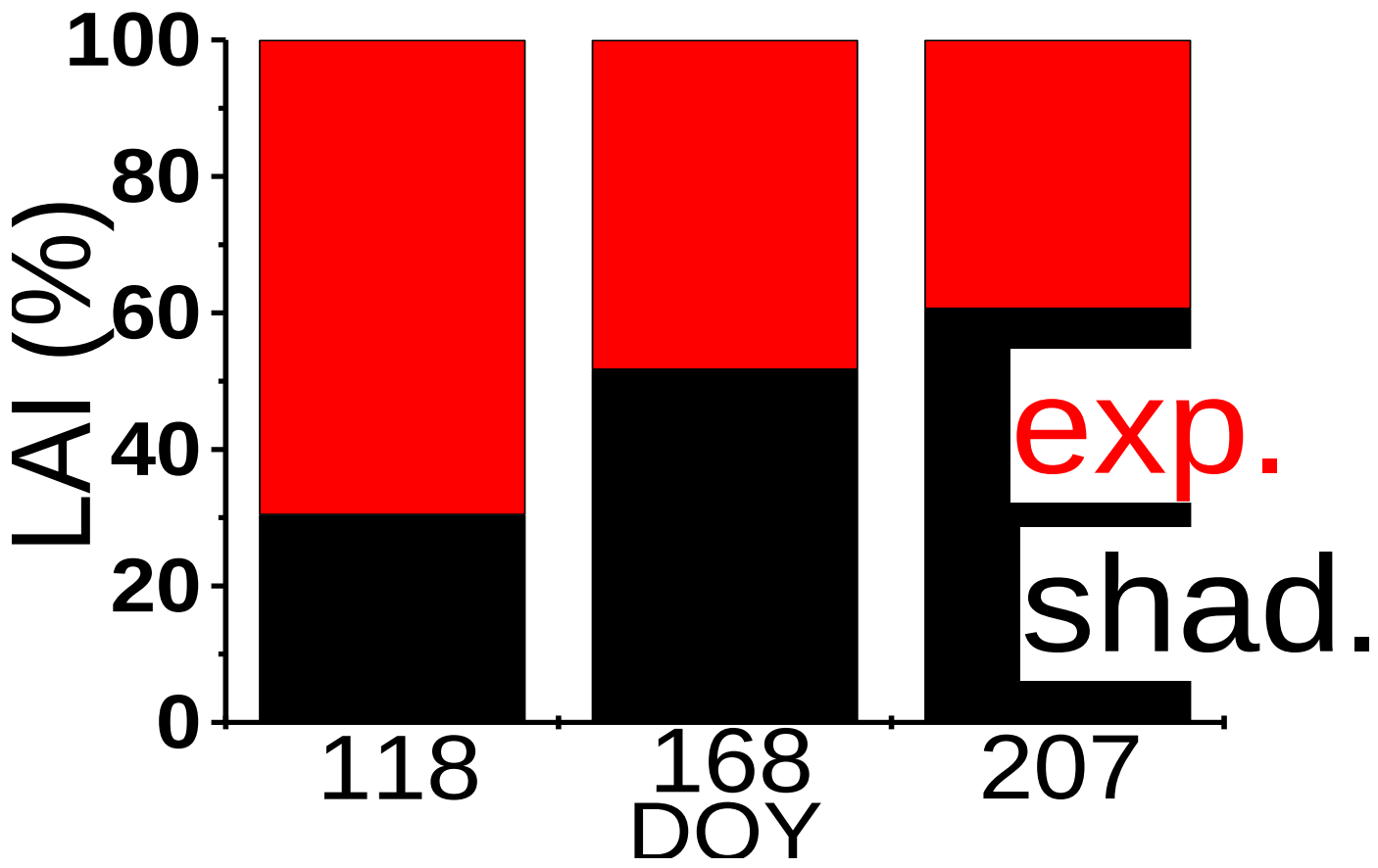
FOTOINIBIZIONE
Inibizione del metabolismo e riduzione dell'efficienza fotosintetica

Una riduzione di circa il 50% dei valori di PPFD per le foglie esposte alla luce può contribuire ad incrementare l'efficienza d'uso dell'acqua e l'accumulo di sostanze di riserva, in particolare per le piante coltivate nell'area mediterranea sottoposte a stress durante il periodo estivo.

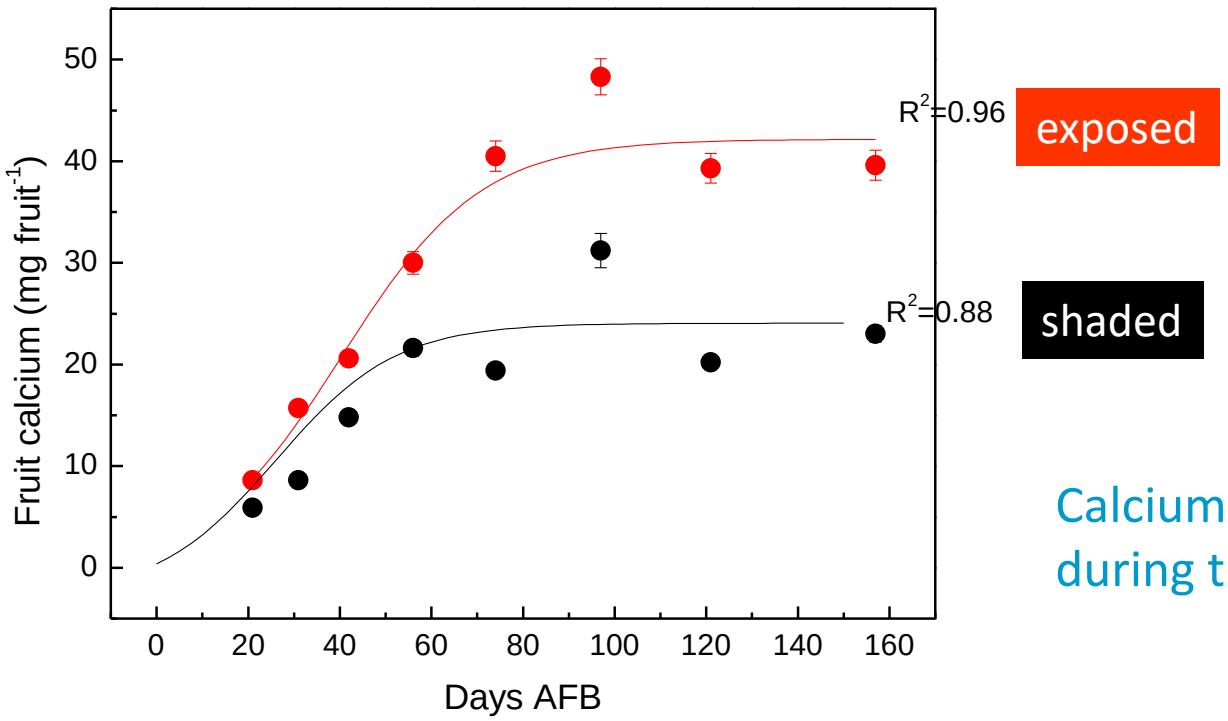
Tendone, 625 p ha^{-1}



Percentage of shaded and exposed leaves in mature kiwifruit plants during the growing season.



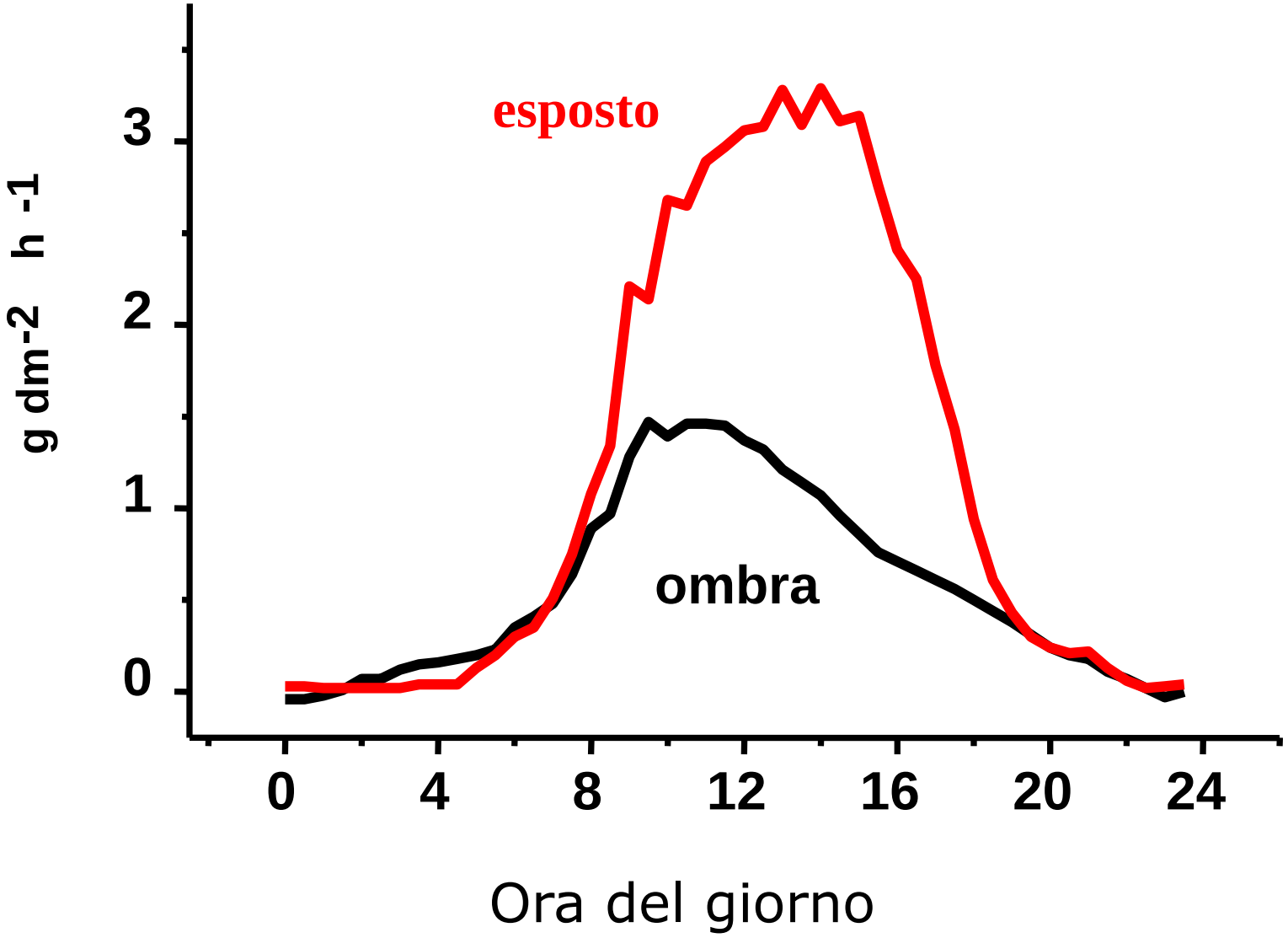
…changing canopy architecture → improving fruit irradiance



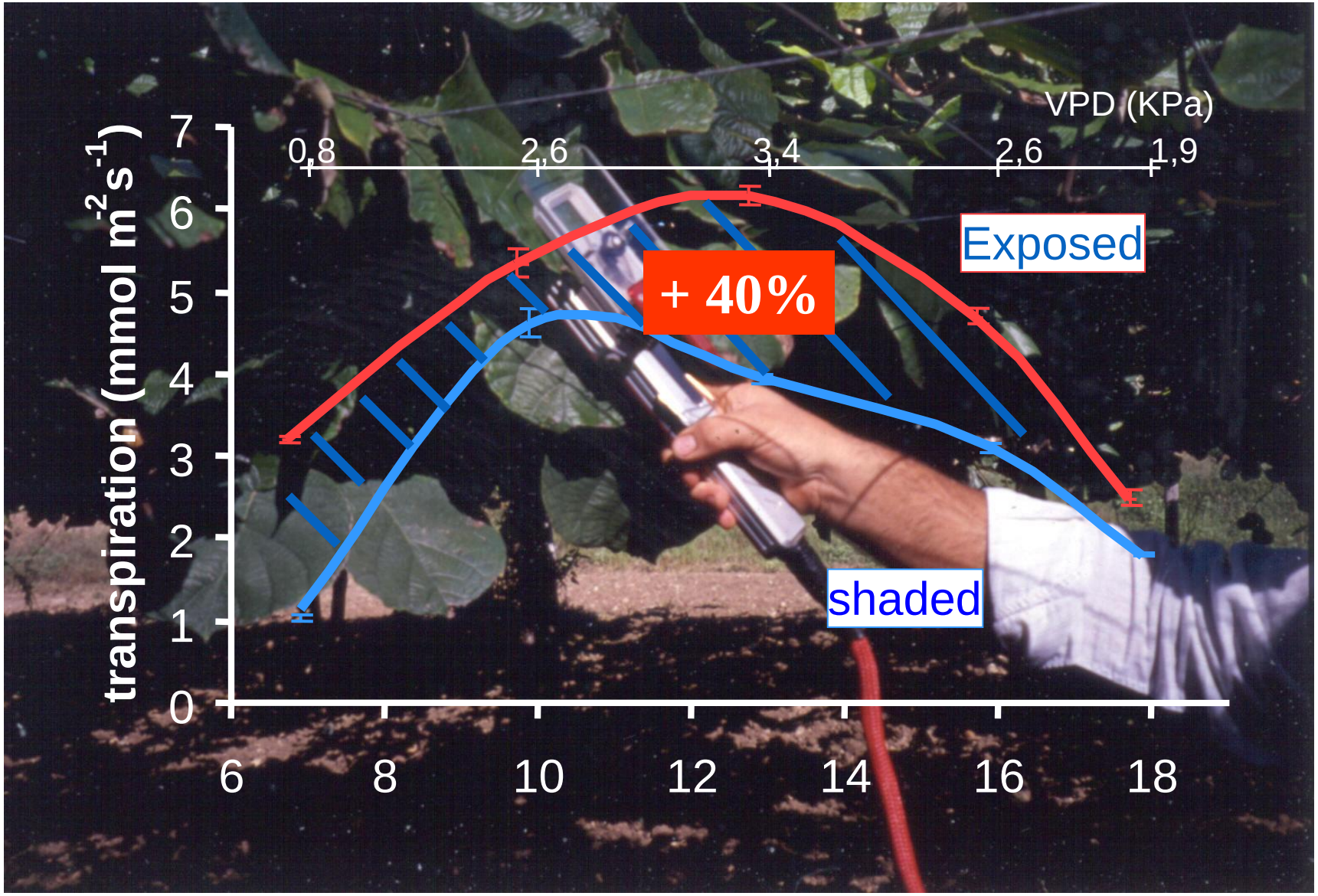
Calcium accumulation in fruit during the season

(from Montanaro et al., 2006 Plant Sci)

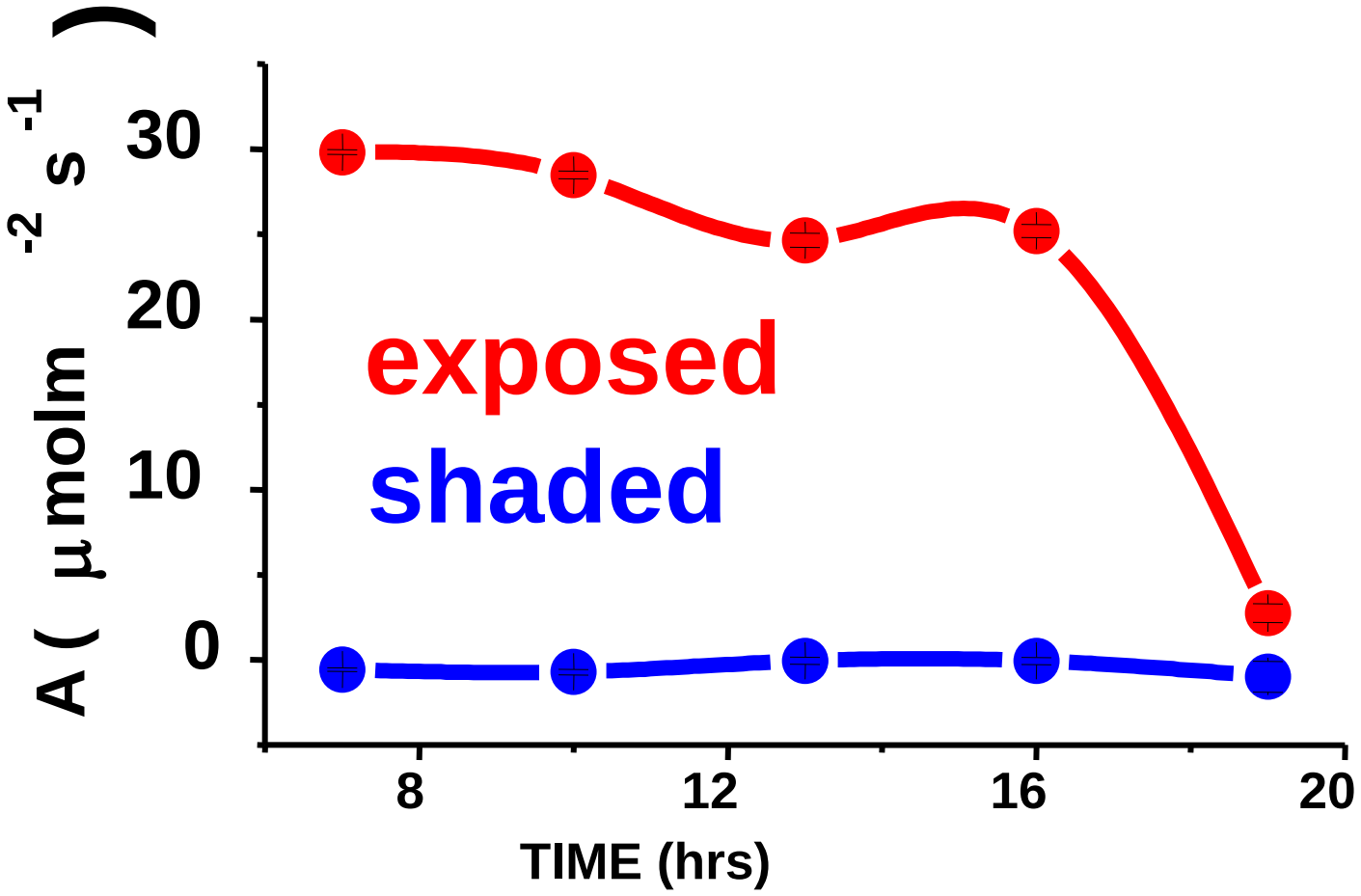
Flusso xilematico in tralci di actinidia (Giugno)



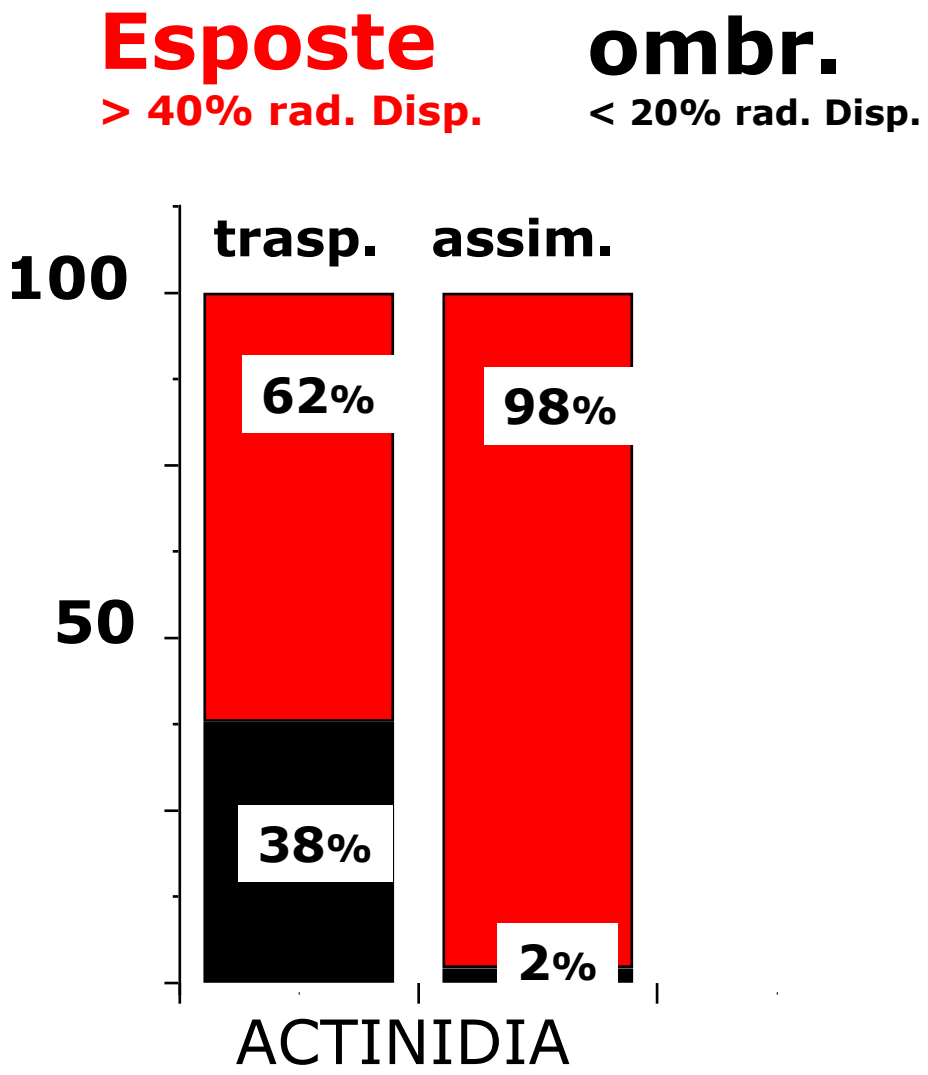
Transpiration of exposed and shaded kiwifruit leaves



Daily variations of assimilation in exposed and shaded leaves in mature kiwifruit plants.



Contributo (%) alla traspiraz. ed assimilaz.di foglie in diverse condizioni di luce (luglio)



NEVE/GRANDINE

6) diapo, danni da grandine sulle strutture.

Fattoalatina.it

Reti antipioggia

Reti antinsetto

CONSIDERAZIONI CONCLUSIVE

-Attenta valutazione dei parametri climatici prima dell’impianto per la scelta della varietà e delle strutture.

- gestione di precisione delle varie operazioni colturali

- miglioramento genetico portinnesti/varietà