La fisiologia di crescita della ciliegia e lo sviluppo del danno da cracking

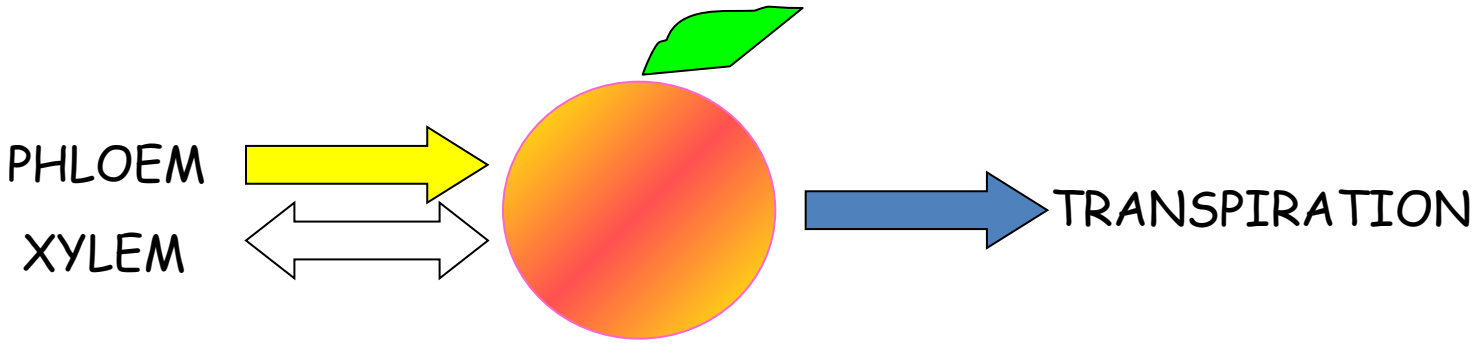
Prof. Brunella Morandi

Ecofisiologia degli alberi da frutto

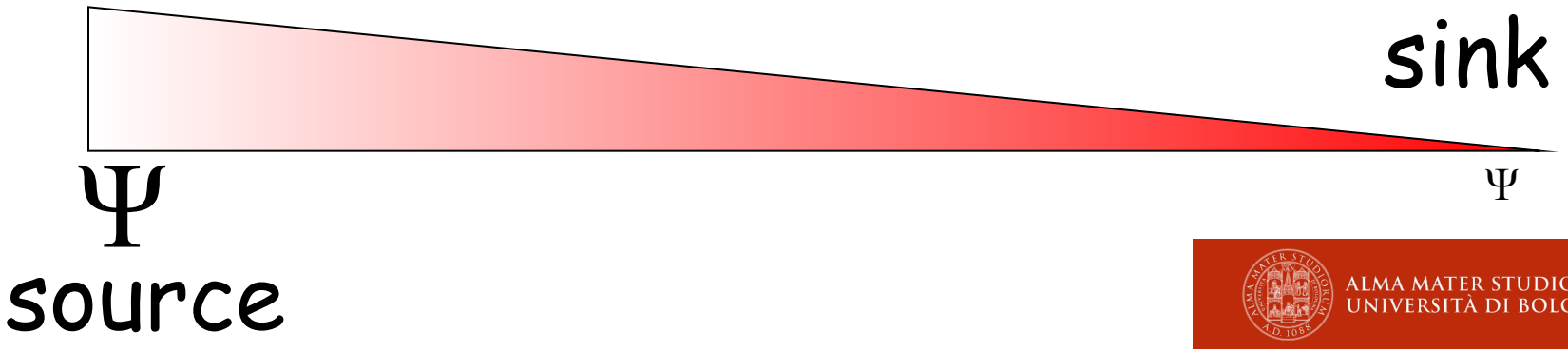
ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA

Department of Agricultural and Food Sciences

La crescita del frutto: un bilancio tra flussi di xilema, floema e traspirazione



I flussi di floema e xilema rispondono a gradienti di potenziale idrico



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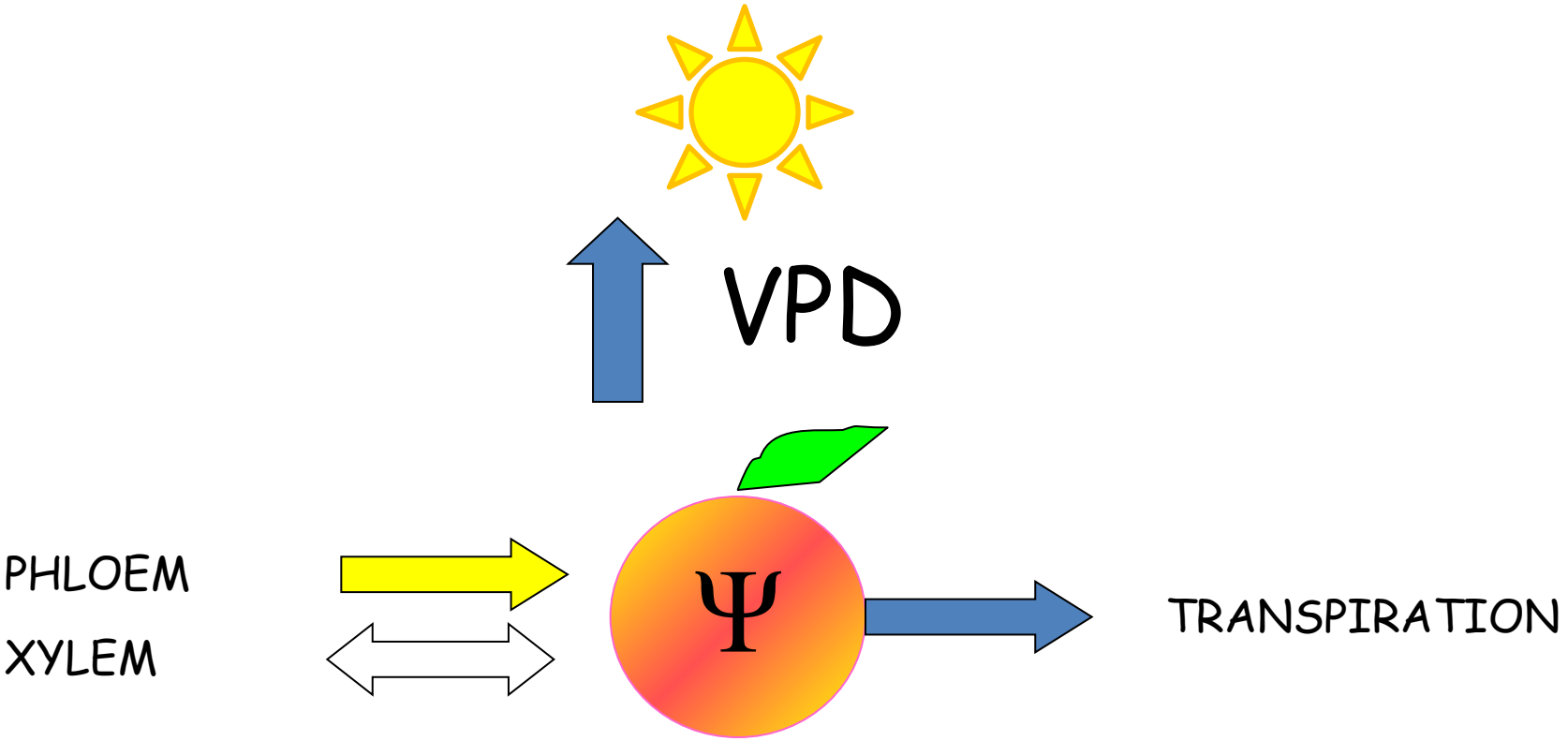
Fruit growth and environmental conditions



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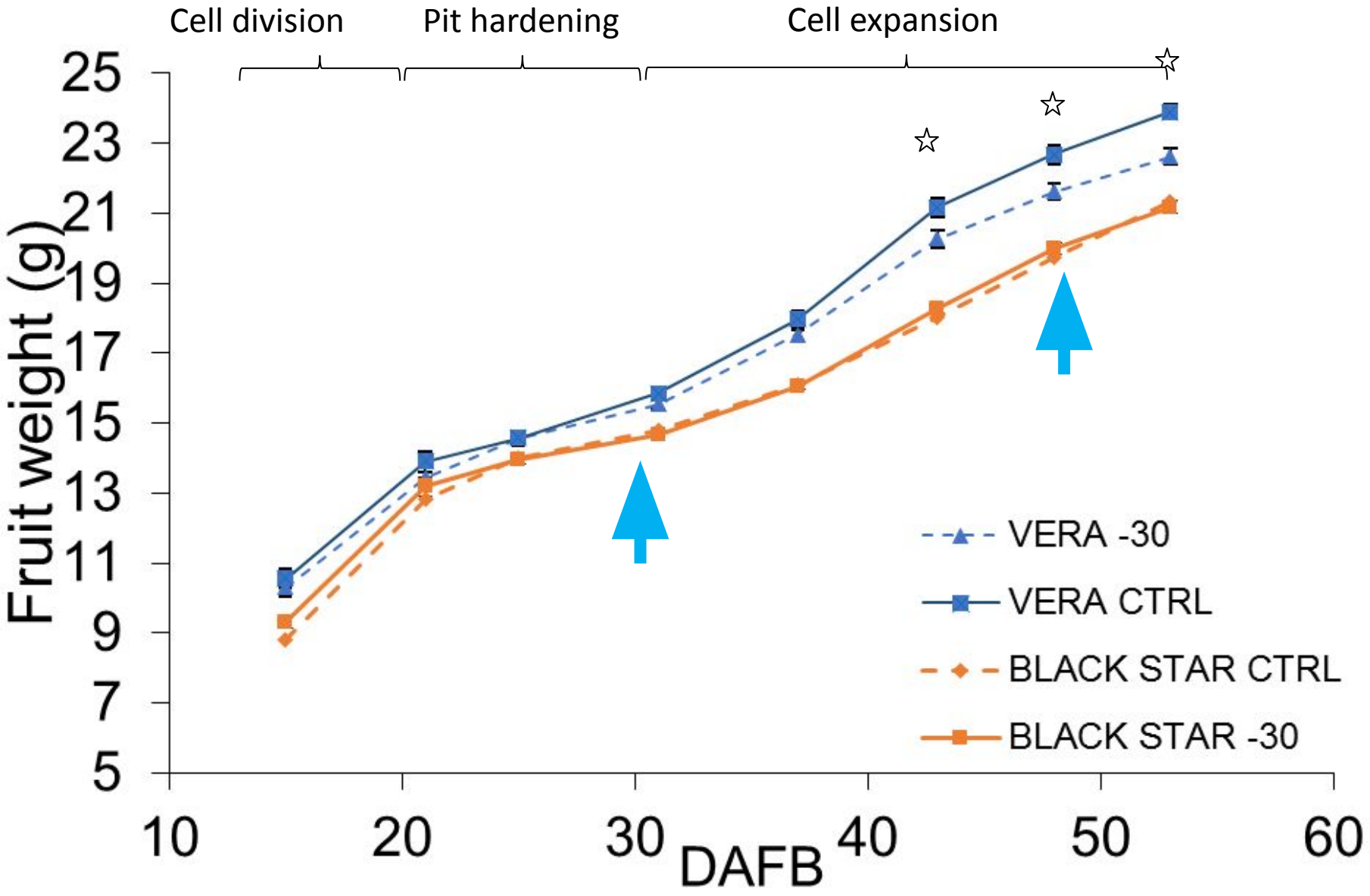
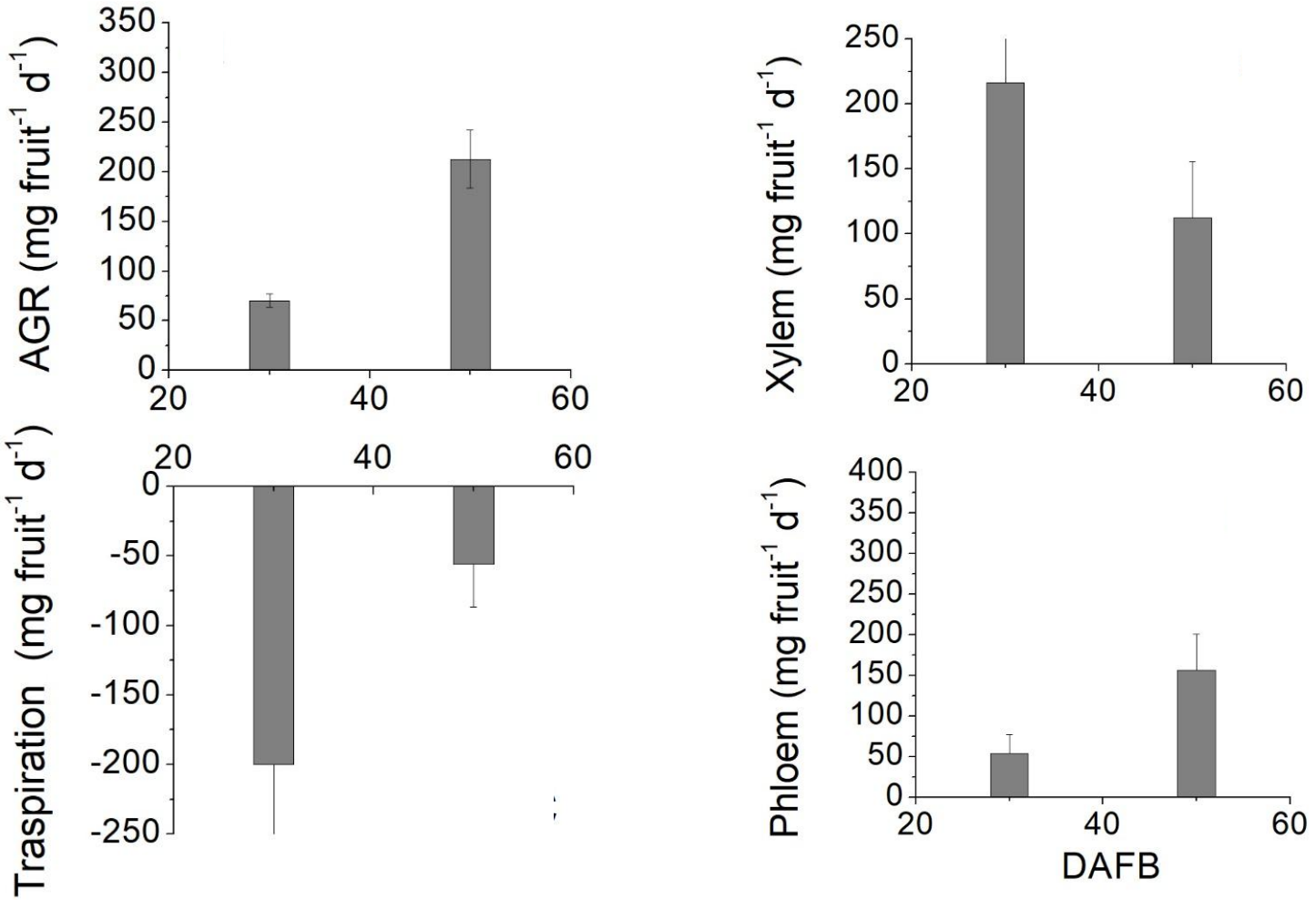
La crescita stagionale della ciliegia



Flussi di floema, xilema e traspirazione da/verso la ciliegia



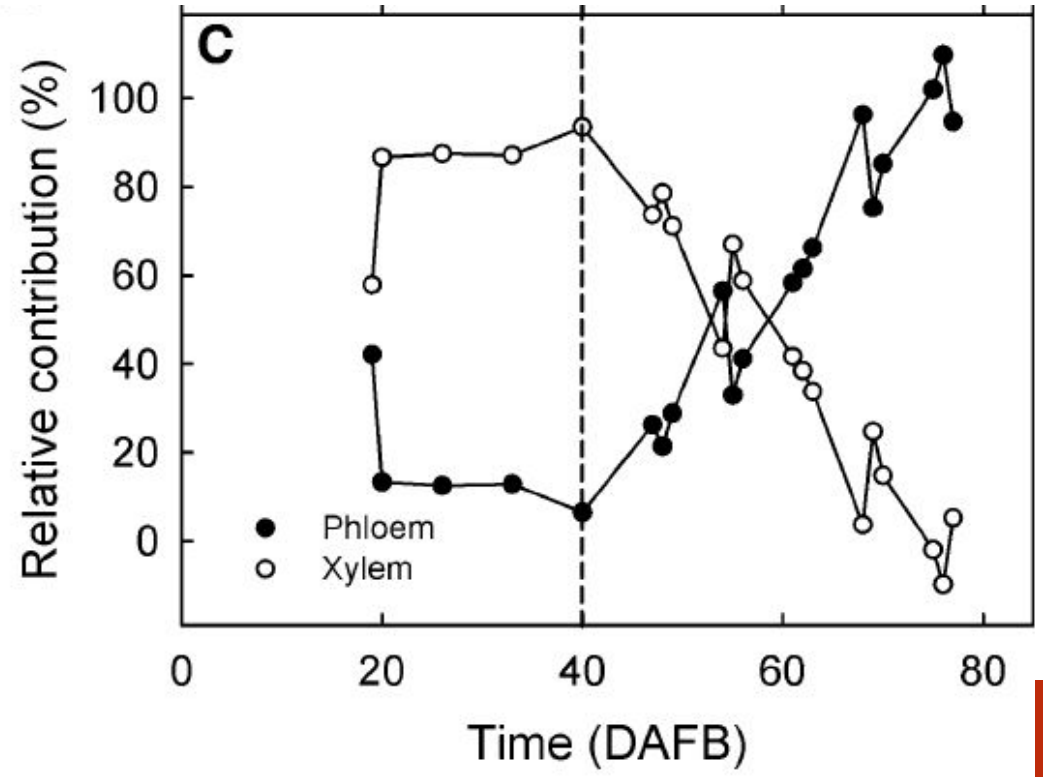
Contributi relativi di floema e xilema lungo la stagione

Trees (2016) 30:1821–1830
DOI 10.1007/s00468-016-1415-4

ORIGINAL ARTICLE

Xylem, phloem, and transpiration flows in developing sweet cherry fruit

Martin Brüggenwirth[1] · Andreas Winkler[1] · Moritz Knoche[1]



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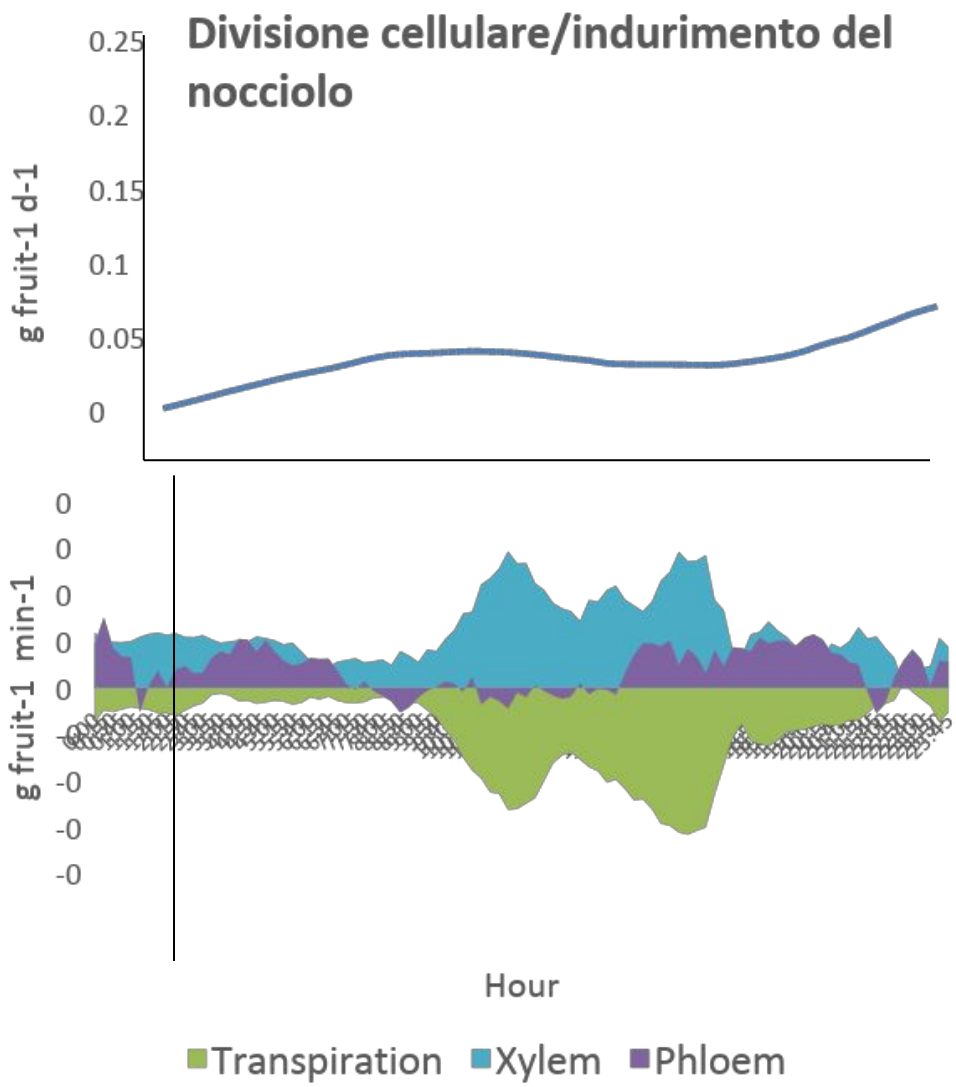
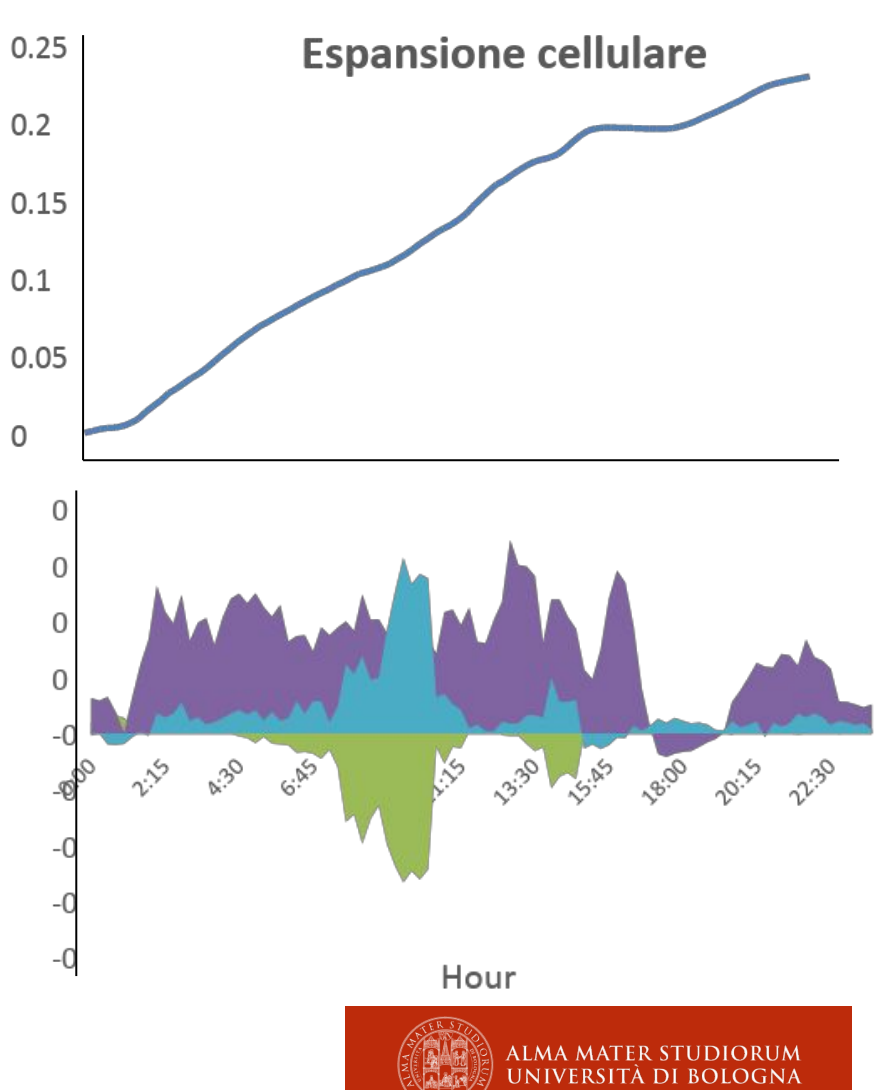
Il monitoraggio della crescita giornaliera della ciliegia mediante sensore frutto

Pre-veraison

Post-veraison

Andamenti giornalieri di crescita del frutto





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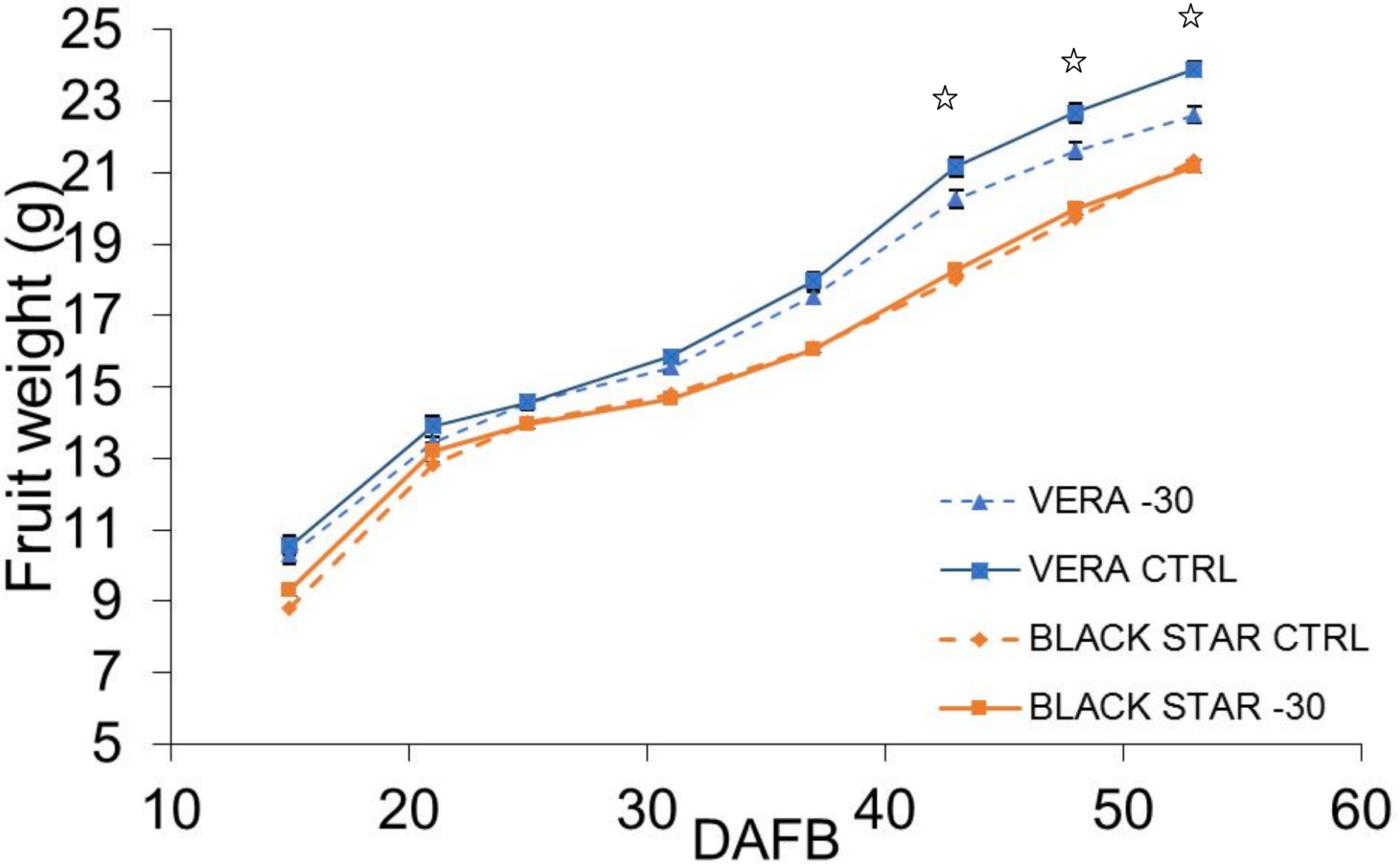
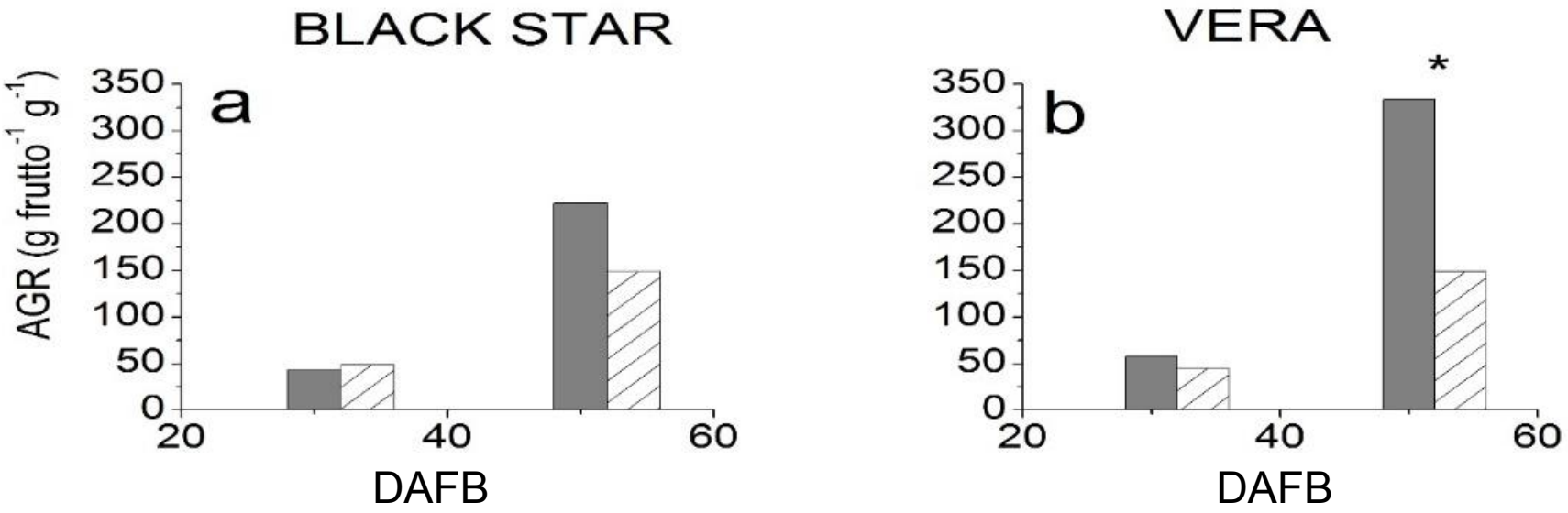
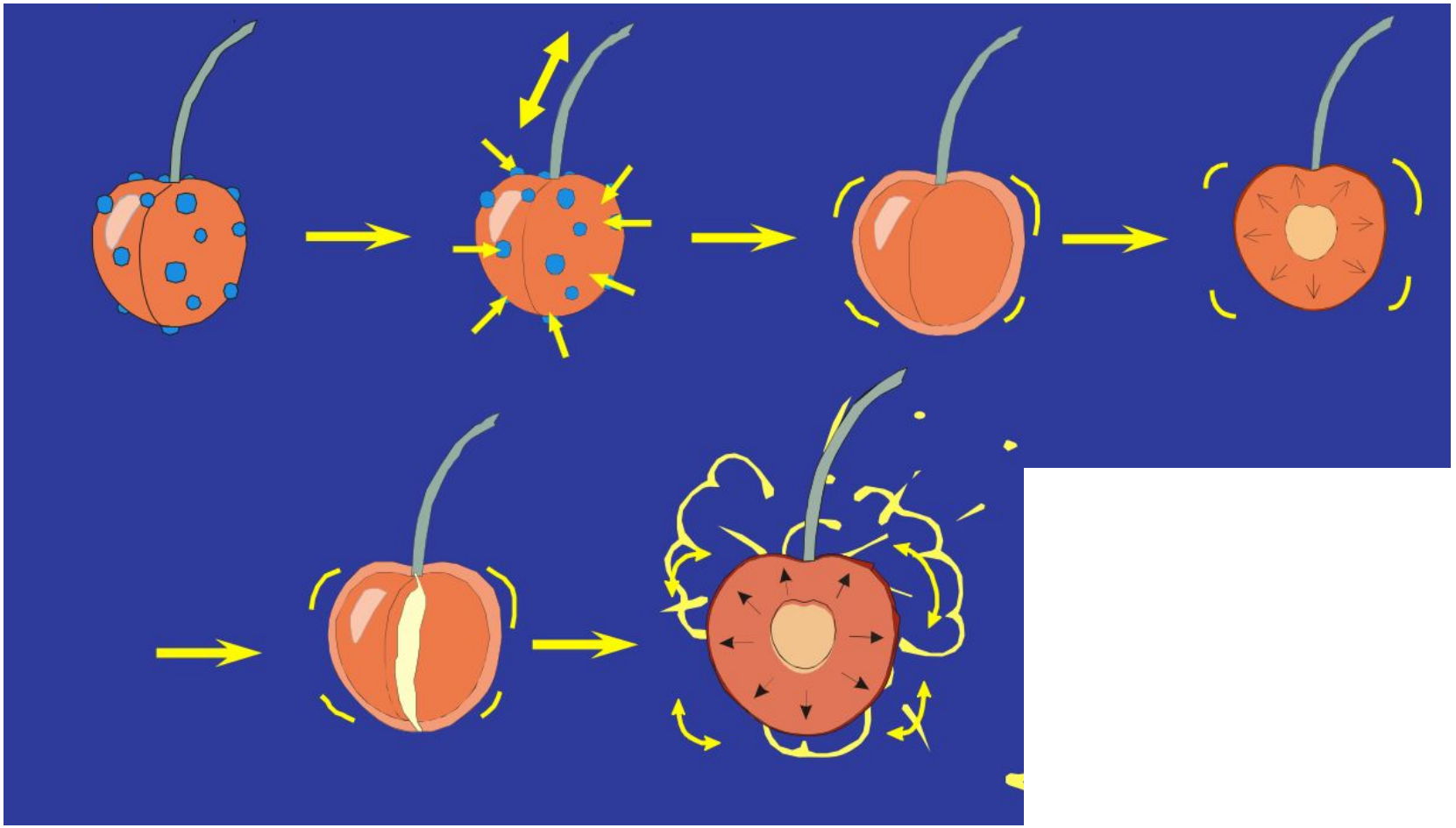
Crescita stagionale della ciliegia di varietà a diversa suscettibilità al cracking



Tasso di crescita del frutto e cracking?





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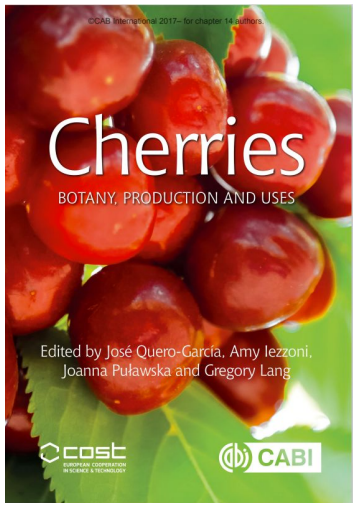


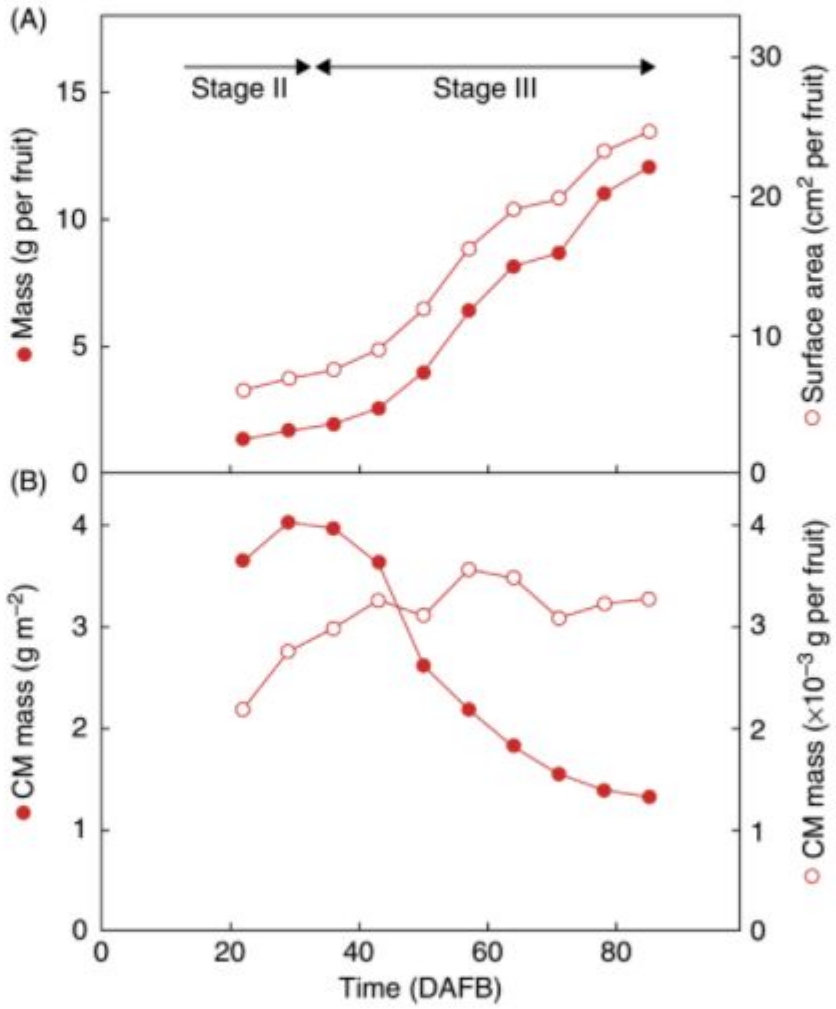
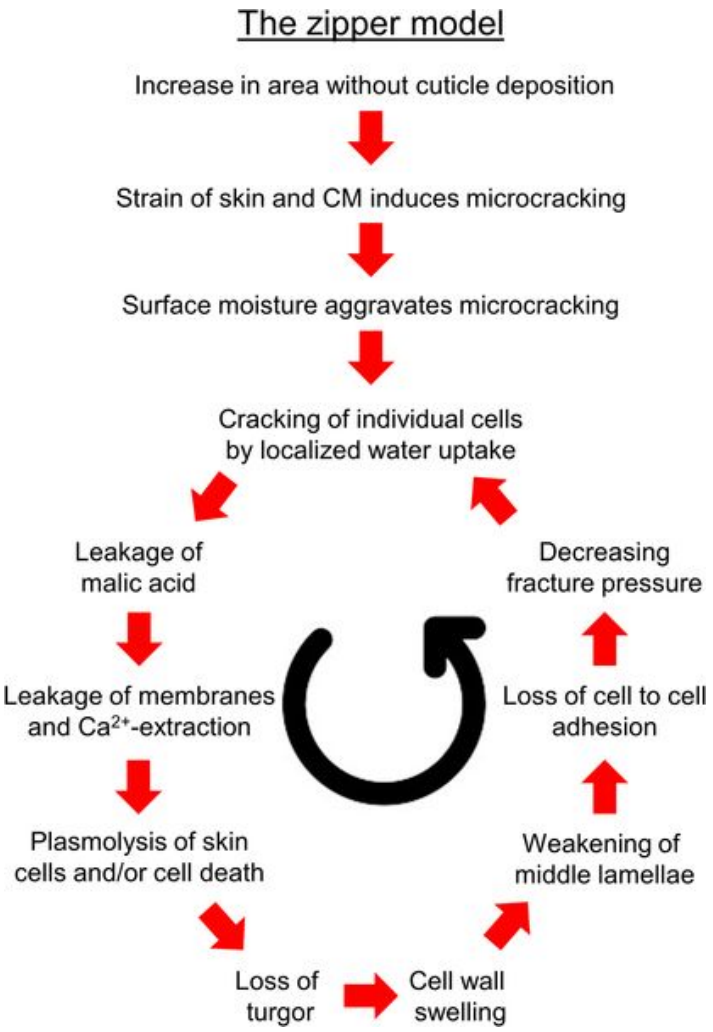


Fig. 7.3. Developmental time course of changes in fruit mass and surface area (A) and mass of the cuticular membrane (CM) (B) on the basis of unit fruit surface area and also the whole fruit. Stages II and stage III of fruit development are indicated. DAFB, days after full bloom. (Redrawn with permission from Peschel *et al.*, 2007.)

. Sketch illustrating the sequence of events in macroscopic rain-cracking of sweet cherry.



Schumann C, Winkler A, Brüggenwirth M, Köpcke K, Knoche M (2019) Crack initiation and propagation in sweet cherry skin: A simple chain reaction causes the crack to 'run'. PLOS ONE 14(7): e0219794. https://doi.org/10.1371/journal.pone.0219794
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0219794

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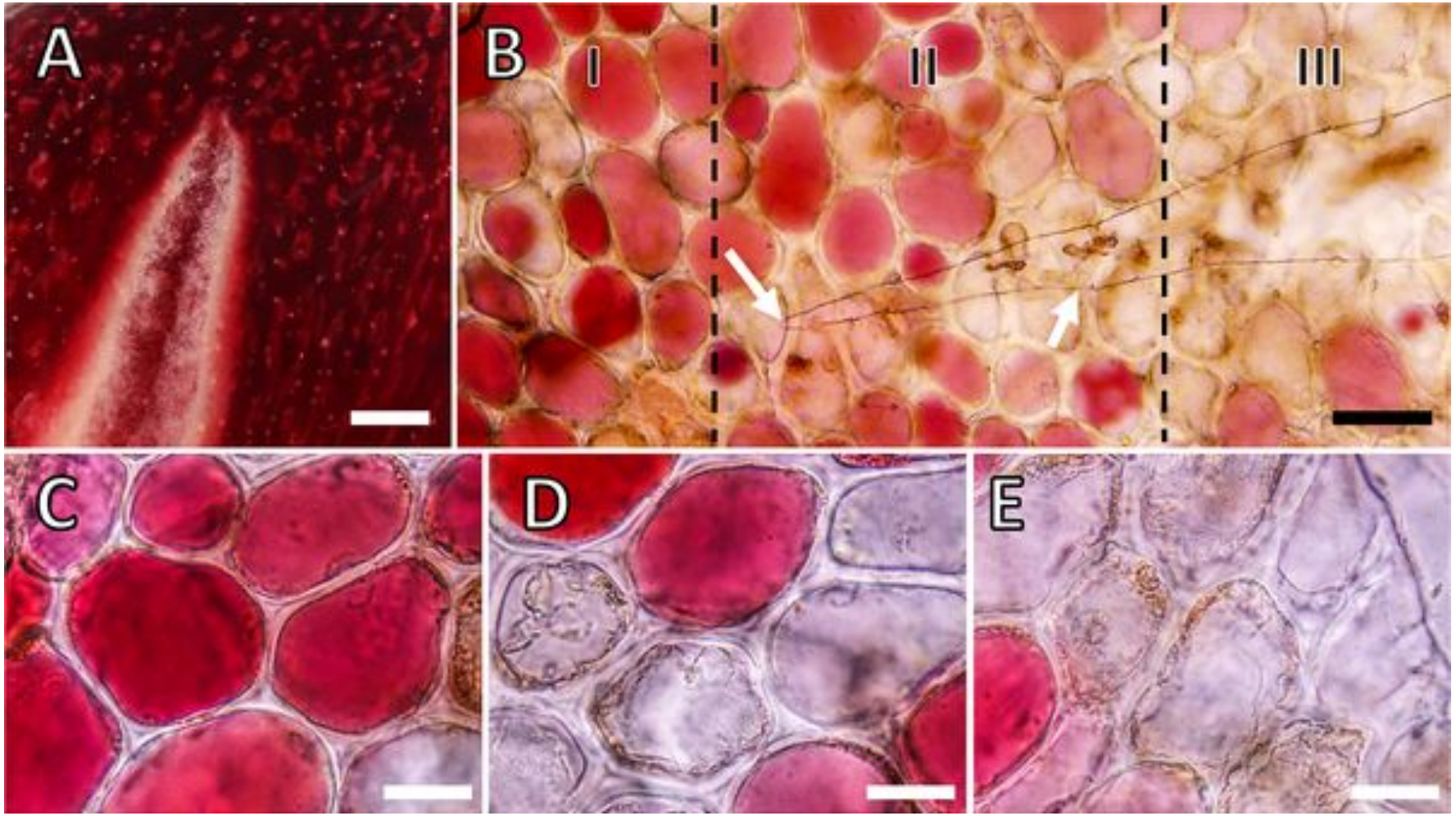
Micrographs of macroscopic cracks (macrocracks) and microscopic cracks (microcracks) in the skin of ‘Regina’ sweet cherry.



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POSSIBILI SOLUZIONI…

-COPERTURE ANTIPIOGGIA?

-MIGLIORAMENTO GENETICO?

-SALI DI CALCIO?

-FILM IMPERMEABILIZZANTI?

Conclusioni

- **Le dinamiche di crescita della ciliegia cambiano nel corso della stagione**
  - La traspirazione del frutto ed i flussi di xilema diminuiscono progressivamente lungo la stagione
  - Al contrario, il contributo floematico aumenta progressivamente
- **Come avviene il cracking?**
  - Durante la fase di espansione cellulare la crescita del frutto non è accompagnata da una deposizione di nuova cuticola.
  - Ciò comporta un aumento dello «sforzo» a cui sono sottoposte l'epidermide e la cuticola stessa.
  - Si formano quindi microspaccature attraverso cui entra l'acqua all'interno dei tessuti sottostanti
  - Si innesca un meccanismo a «cerniera» che determina la progressiva plasmolisi ed il distacco della cellule

ICS

INTERNATIONAL
CHERRY
SYMPOSIUM

INTERNATIONAL CHERRY SYMPOSIUM
4 May 2022, from 9:30 a.m. to 6:00 p.m.
MACFRUT 2022, RIMINI - EXPO CENTRE - SALA NERI

Number of places available: 300

The Symposium will be in English with simultaneous translation into Italian.

It is possible to participate remotely, prior registration.

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Grazie per l'attenzione

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