

Harvest maturity impacts fruit quality

Christine Frisina &
Dario Stefanelli

Background

Aromatic Volatile Organic Compounds

Consumer perception of poor quality fruit because doesn't smell peachy/fruity

What factors may affect fruit aroma?

Maturity stage at harvest

Shelf life

Cold storage



Individual fruit; I_{AD} as physiological maturity index (correlated with ethylene)

Over the course of the program:

13 cultivars: 4215 ethylene samples; 2721 VOCs samples

I_{AD} by cultivar

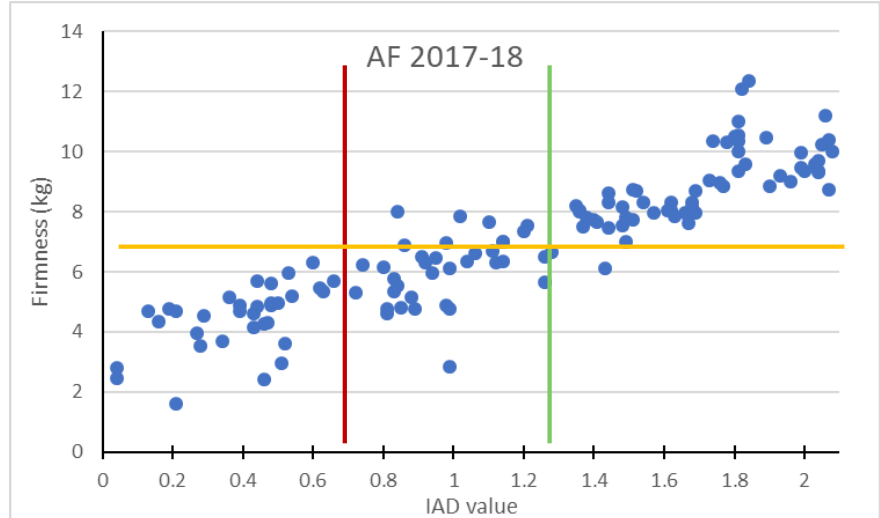
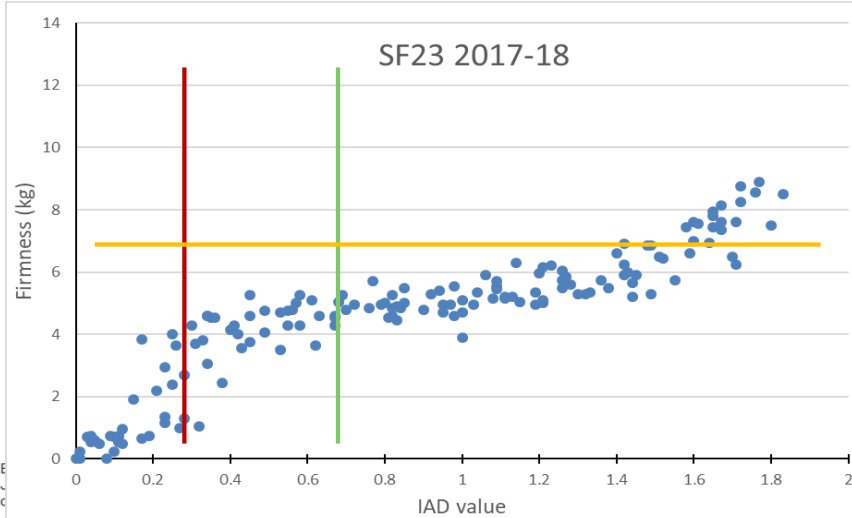
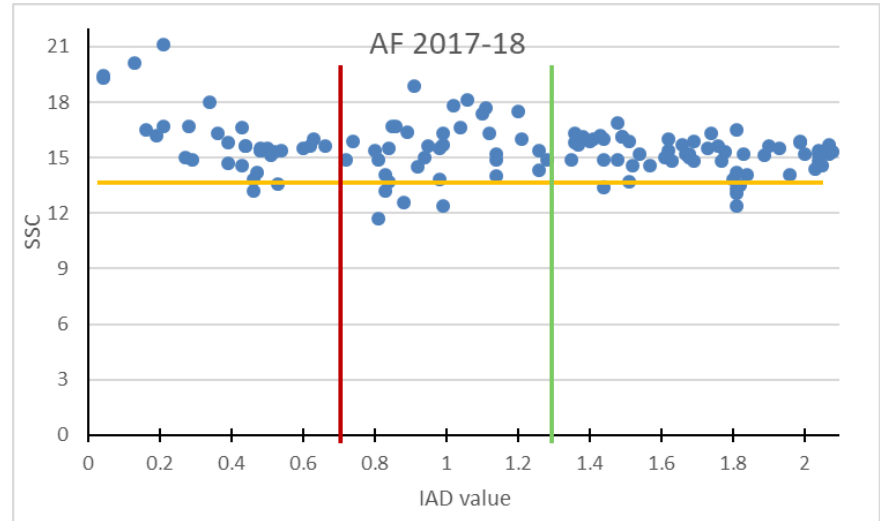
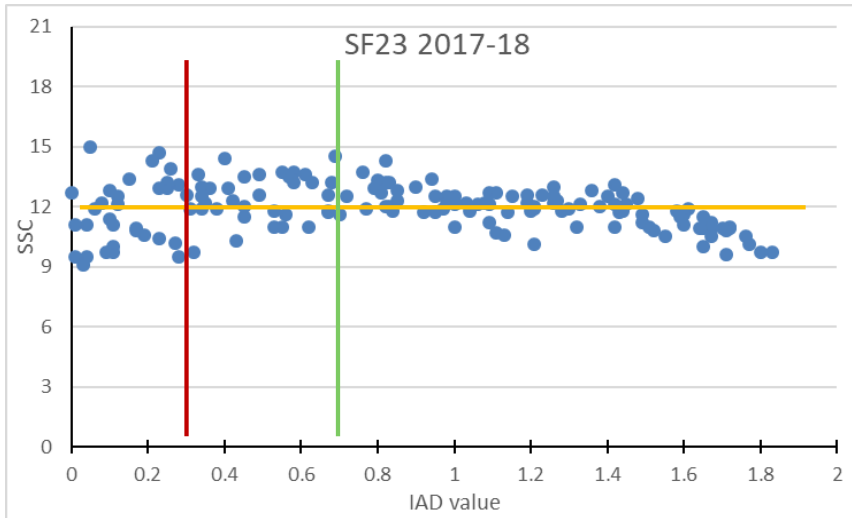
Cultivar	No ethylene production: Immature	Onset ethylene production: Commercial ripe	Climacteric ethylene production: Full ripe
Snow Flame 23	2.0-0.9	0.9-0.3	0.3-0
Snow Flame 25	2.0-1.0	1.0-0.5	0.5-0
Ice Princess	2.0-1.3	1.3-0.5	0.5-0
O'Henry: Early	2.0-0.9	0.9-0.6	0.6-0
: Late	2.0-1.2	1.2-0.7	0.7-0
August Flame	2.0-1.3	1.3-0.7	0.7-0
Red Haven	2.0-1.6	1.6-0.6	0.6-0
September Sun	2.0-1.2	1.2-0.8	0.8-0
Rose Bright	2.0-1.0	1.0-0.4	0.4-0
Autumn Bright	2.0-1.0	1.0-0.6	0.6-0
August Bright	2.0-0.9	0.9-0.4	0.4-0
September Bright	2.0-1.2	1.2-0.5	0.5-0

Averaged data from 2-3 seasons

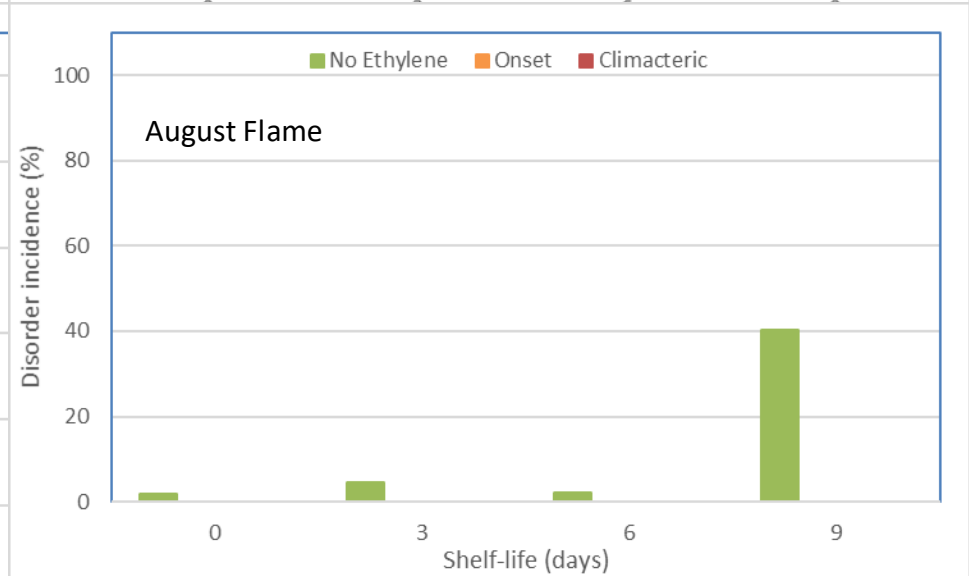
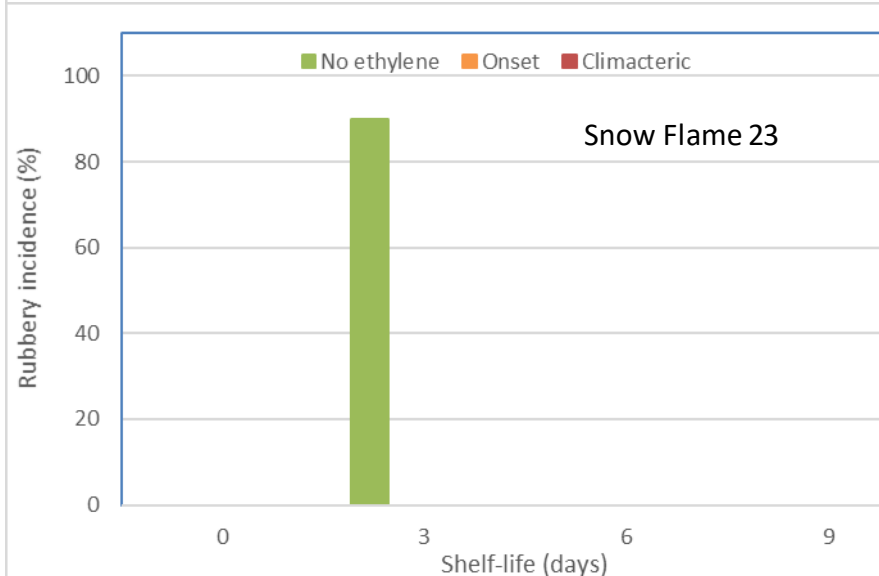
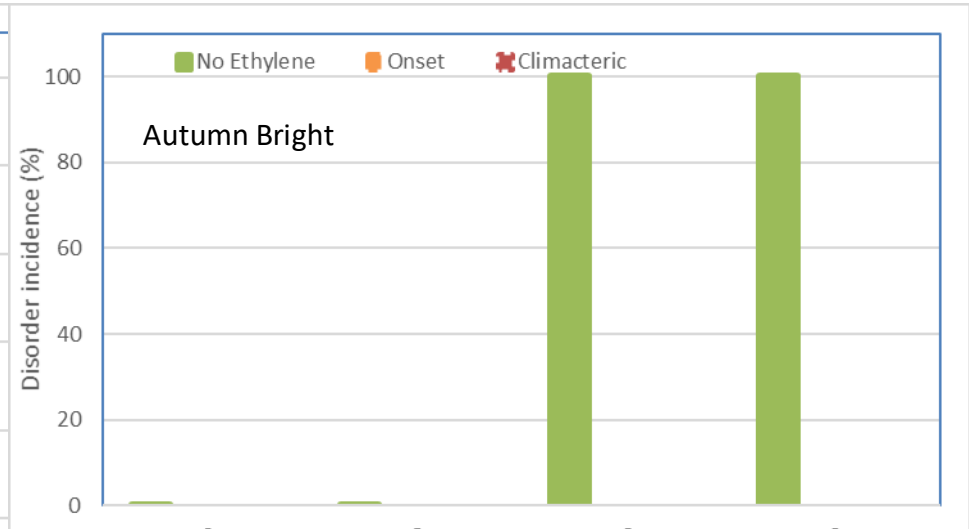
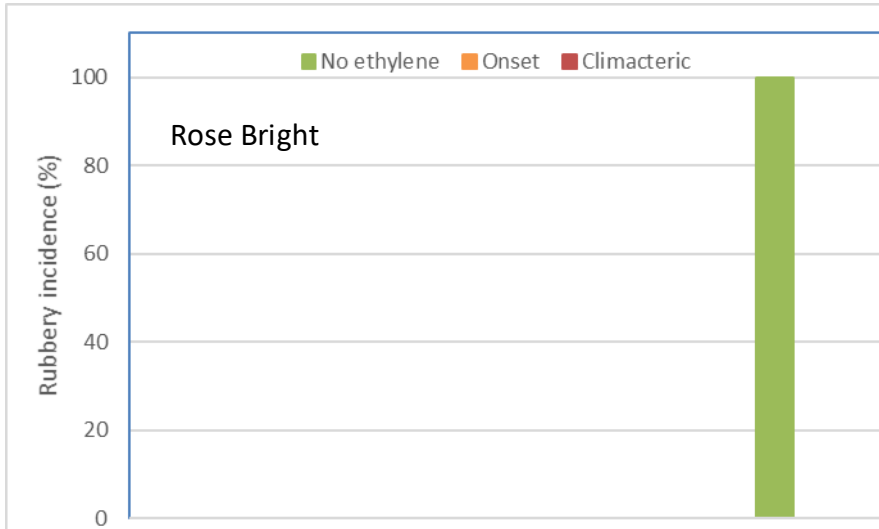
Snow Fall: late season (end Mar) white peach; inconclusive, not enough data

Physiological maturity: using I_{AD}

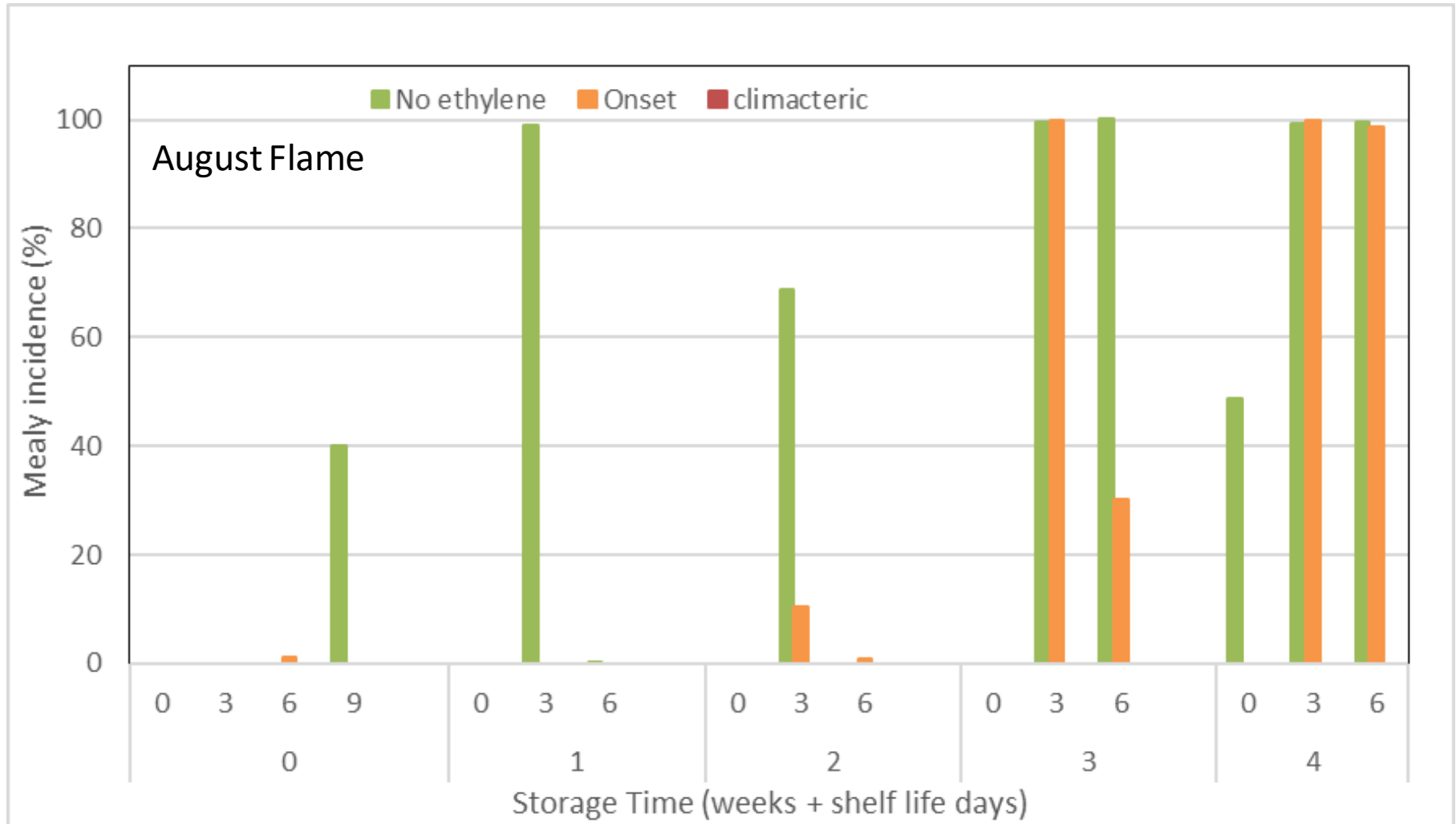
Physiological development stage correlated with ethylene production using I_{AD} ; VOCs and ethylene measured on 10 fruit per 0.1 I_{AD} value



Incidence of disorders during shelf life

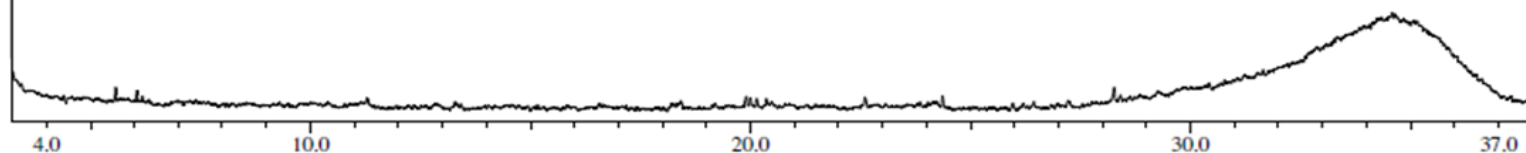


Incidence of mealiness during storage

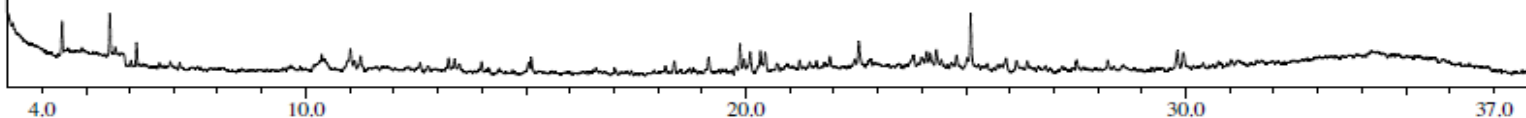


Physiological maturity: VOCs and storage

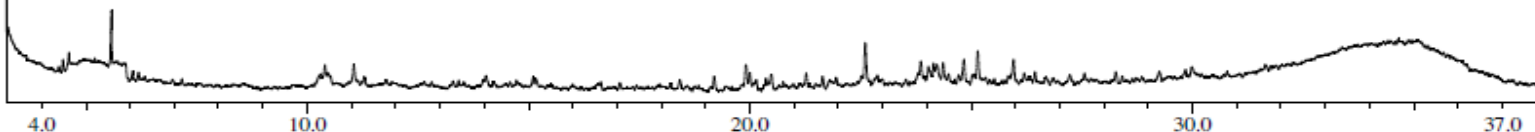
No ethylene August Flame peach, IAD factor 1.53, no ethylene production



Onset August Flame peach IAD factor 1.18, 5.24 nL/kg.hr ethylene production



Climacteric August Flame peach, IAD factor 0.58, 21.09 nL/kg.hr ethylene production



Main points so far

- Fruit with the same size, weight, appearance, SSC, TA or Firmness may not be at the same physiological development stage at harvest
- If ethylene is not present on the day of harvest there is greater risk of the fruit being incapable of continuing development.
These fruit will soften, but not ripen
- Storage: Aroma can recover production to some extent, after being returned to ambient/warming temperatures –
this is very dependent upon the physiological maturity stage at harvest, and cultivar

Thank you

Questions?

Acknowledgements:

