



# Grand Valley 2008 grape variety trial

Horst Caspari





## NE-1020 Variety trial at Orchard Mesa

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In 2008, we started a new variety trial at the Western Colorado Research Center – Orchard Mesa.

This trial is part of a nation-wide network of variety trials referred to as NE-1020 project: “Multi-State Evaluation of Winegrape Cultivars and Clones”.

Evaluation of several *V. vinifera* and hybrid varieties.

A second NE-1020 trial was planted at the Western Colorado Research Center – Rogers Mesa.

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## Materials and Methods

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- Originally planted in 2008
  - Design: RCB (6 blocks, 4-vine plots)
  - Vine x row spacing is 5' x 8'
  - Cordon and spur
  - Vertical Shoot Positioning
  - Drip irrigation with bare soil
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## NE-1020 Variety trial at Orchard Mesa

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- Original planting all *V. vinifera*
  - Aglianico, Aleatico, Albarino, Barbera, Cabernet Sauvignon, Carignan, Cinsault, Furmint, Garnacha Tinta, Malvaisa bianca, Marsanne, Merlot, Mourvedre, Roussanne, Souzao, Tocai Friulano, Touriga Nacional, Trousseau, Verdejo, Verdelho
  - All grafted to rootstock 110R
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## NE-1020 Variety trial at Orchard Mesa

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- Additional varieties were planted in guard rows surrounding the NE-1020 variety trial.
  - *V. vinifera* – Carmenere, Graciano, Petit Verdot, Refosco, Tinta Carvalha, Touriga Nacional, Verdelho
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## Materials and Methods

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An early severe fall frost in 2008 and an extreme cold temperature event in late fall 2009 caused high vine losses for a number of varieties.

In 2011, **Aglianico** and **Carignan** were replaced by **Chambourcin** and **Marquette**.

In 2012, **Aleatico**, Furmint, and **Trousseau** were replaced by **Durif**, **Zweigelt**, and **Cabernet Dorsa**.

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## Materials and Methods

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Between 2011 and 2015, missing vines were replaced for the following varieties:

Albarino, Cabernet Sauvignon, Chambourcin, Cinsault, Garnacha Tinta, Malvasia bianca, Marquette, Marsanne, Merlot, Mourvedre, Souzao, Touriga Nacional, and Verdelho.

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## Materials and Methods

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### Minimum temperatures during dormancy (2010 to 2018 season)

- -13.0 (10 Dec 2009)
  - -2.8 F (1 Jan 2011)
  - 9.7 F (23 Dec 2011)
  - -6.5 F (15 Jan 2013)
  - -5.3 F (9 Dec 2013)
  - 4.7 F (31 Dec 2014)
  - -2.5 F (28 Dec 2015)
  - -1.4 F (6 Jan 2017)
  - 8.8 F (22 Jan 2018)
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## Bud cold hardiness

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Controlled freezing test were used to monitor bud cold hardiness of several varieties over 3 to 4 years.

Bud survival was evaluated for all varieties prior to dormant pruning.

Pruning adjustments were made if/when primary bud mortality exceeded 5 %.

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## Results

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In 2015, highest yields were with Cinsault, Mourvedre, Cabernet Sauvignon, Albarino, Barbera, and Durif (2.8 to 2.1 ton/acre).

Lowest yields were with Merlot, Cabernet Dorsa, Tocai Friulano, Marquette, and Garnacha Tinta (0.2 to 1.0 ton/acre).

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## Results

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In 2016, highest yields were with Albarino, Zweigelt, and Cabernet Sauvignon (2.7 to 2.2 ton/acre).

Lowest yields were with Garnacha Tinta, Durif, Tocai Friulano, Merlot, Verdejo, and Roussanne (0.2 to 0.7 ton/acre).

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## Results

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In 2017, highest yields were with Cabernet Sauvignon, Albarino, Barbera, Cinsault, Durif, and Mourvedre (4.2 to 3.2 ton/acre).

Lowest yields were with Verdejo and Tocai Friulano (0.5 ton/acre).

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## Results

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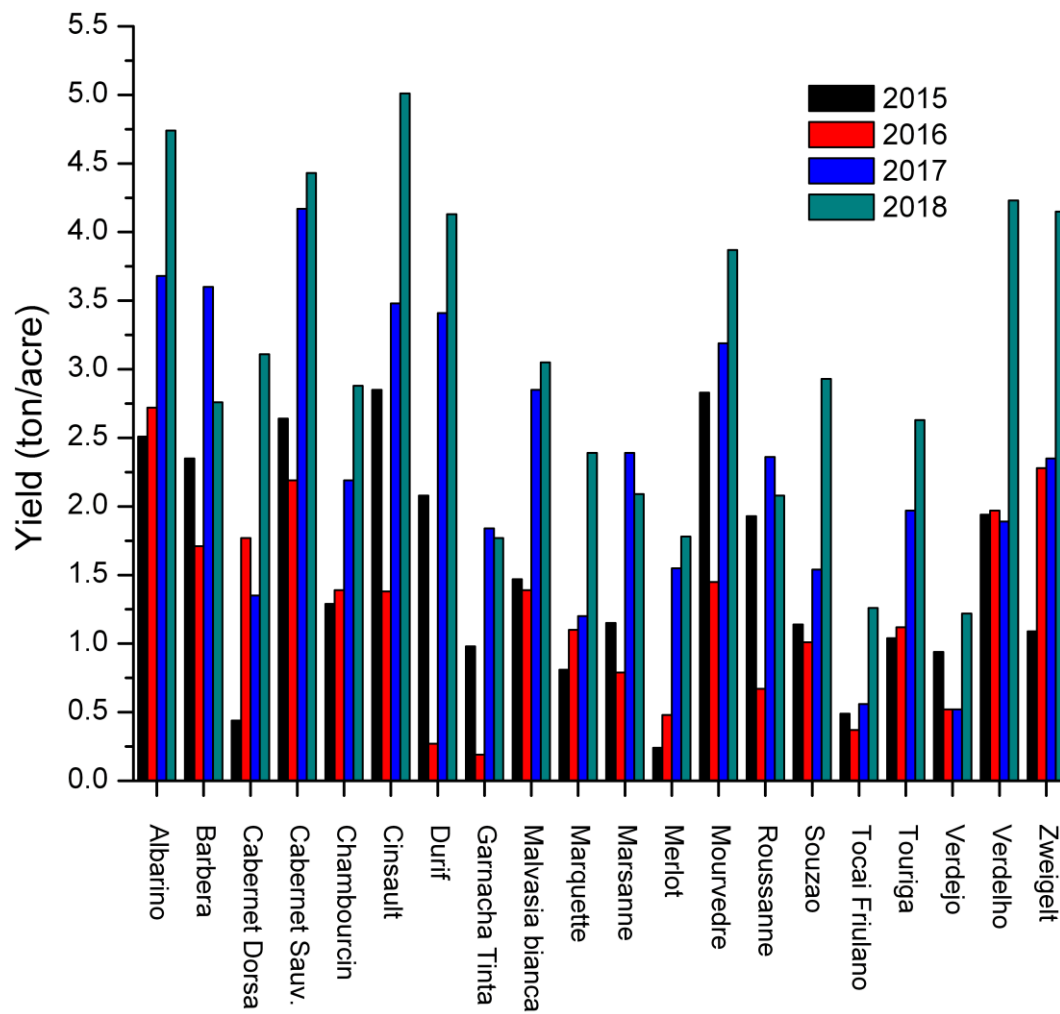
In 2018, highest yields were with Cinsault, Albarino, Cabernet Sauvignon, Verdelho, Zweigelt, and Durif (5.0 to 4.1 ton/acre).

Lowest yields were with Verdejo, Tocai Friulano, Garnacha Tinta, and Merlot (1.2 to 1.8 ton/acre).

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## 2015 – 2018 yields



## Results

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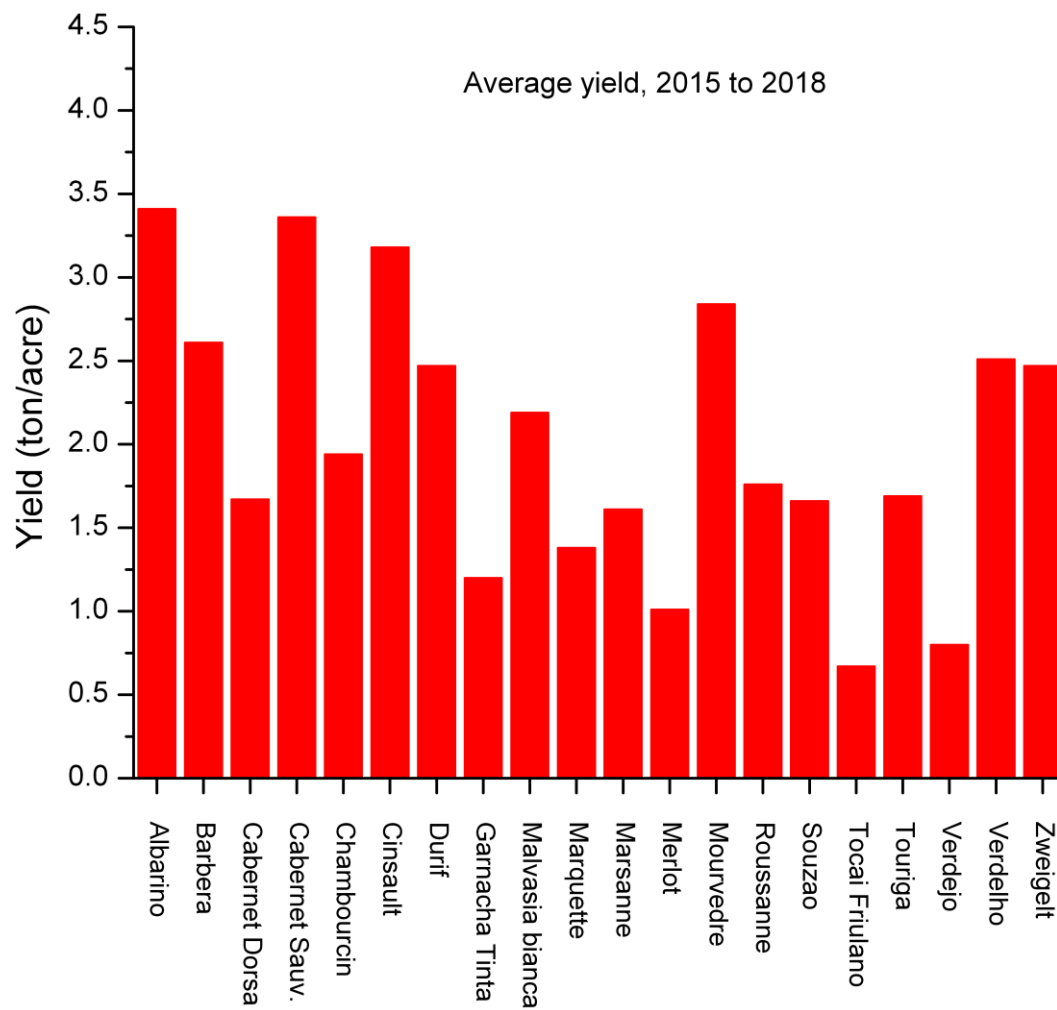
After four years (2015 to 2018), Albarino, Cabernet Sauvignon, and Cinsault had the highest average yields (3.4 to 3.2 ton/acre).

Lowest average yields were with Tocai Friulano and Verdejo (0.7 to 0.8 ton/acre).

Low average yields with Tocai Friulano and Verdejo are due to low vine survival (<10 %).

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## Four year average yield (2015-2018)





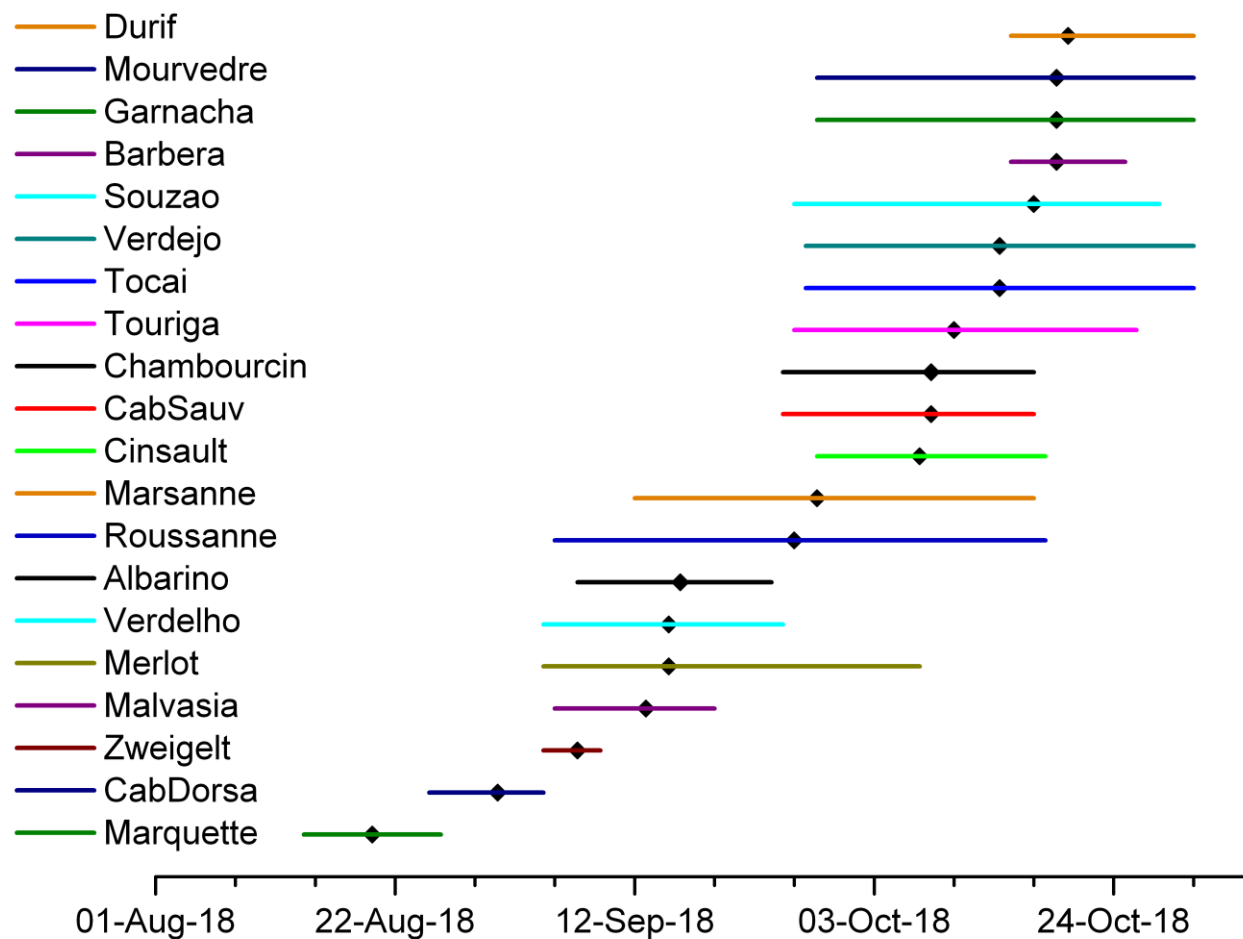
## Results

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Average harvest dates ranged from August 20 for Marquette (range 14-26 August) to October 20 for Durif (range 15-31 October).

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## Average and range of harvest dates (2015-2018)







## Bud cold hardiness

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Albarino, Cabernet Dorsa, and Zweigelt were generally more cold hardy than Chardonnay.

Cabernet Sauvignon and Souzao generally had similar bud cold hardiness to Chardonnay in mid winter, but differences were found in cold acclimation in fall and de-acclimation in spring.

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## Bud cold hardiness

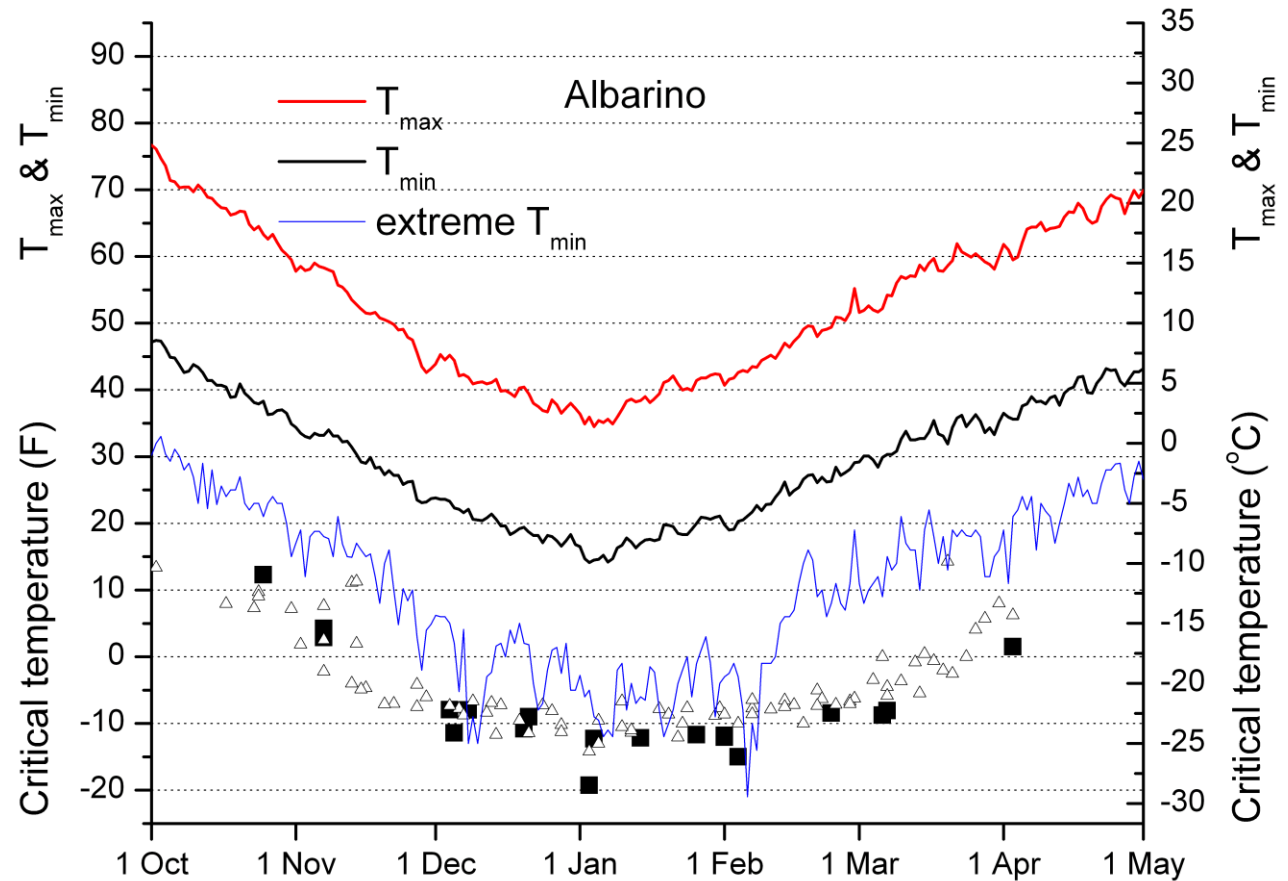
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Albarino had no or minimal primary bud damage in 4 dormant seasons (2015/16 to 2018/19).

Souzao had approximately 33 % primary bud damage in 2015/16 but no damage in the 2016/17 to 2018/19 dormant seasons.

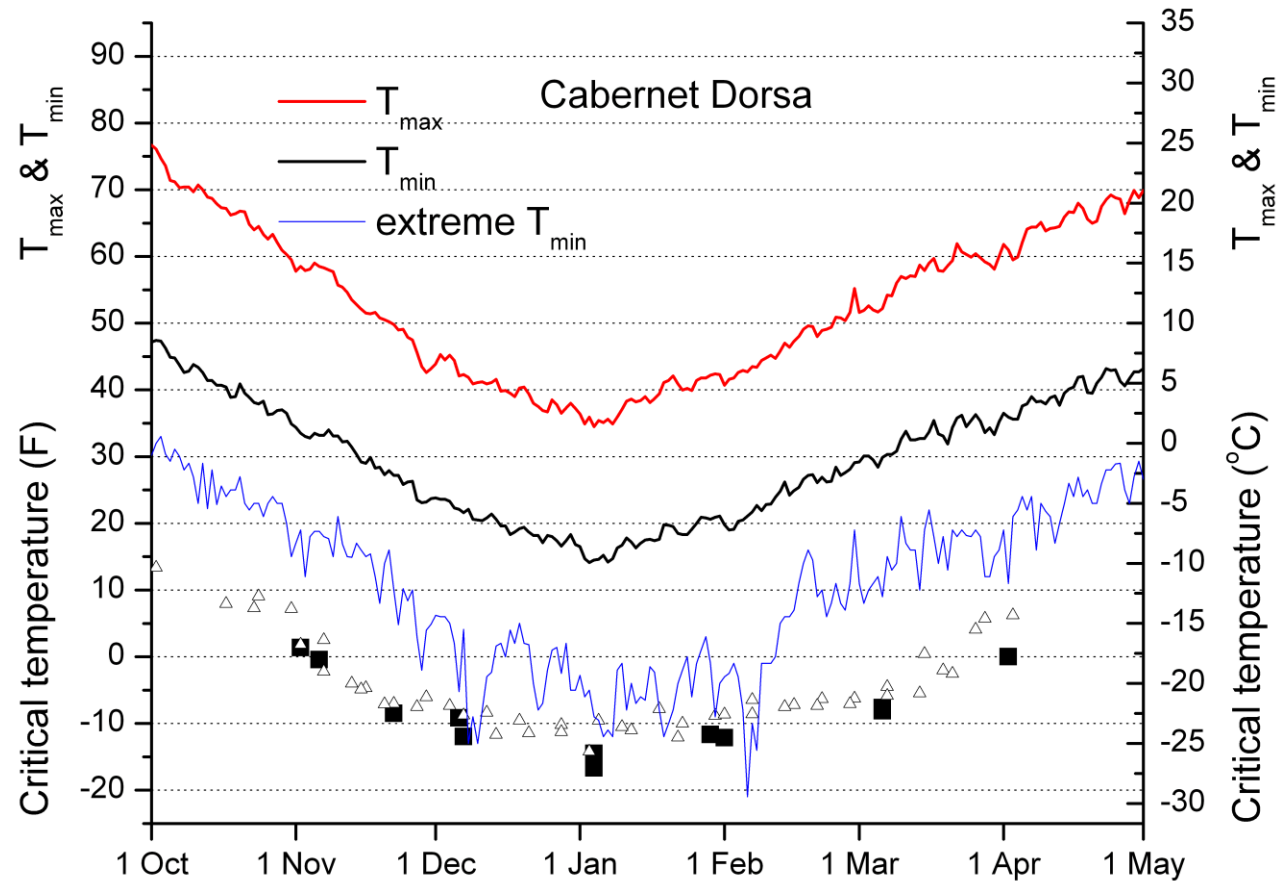
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## Bud cold hardiness, Albarino



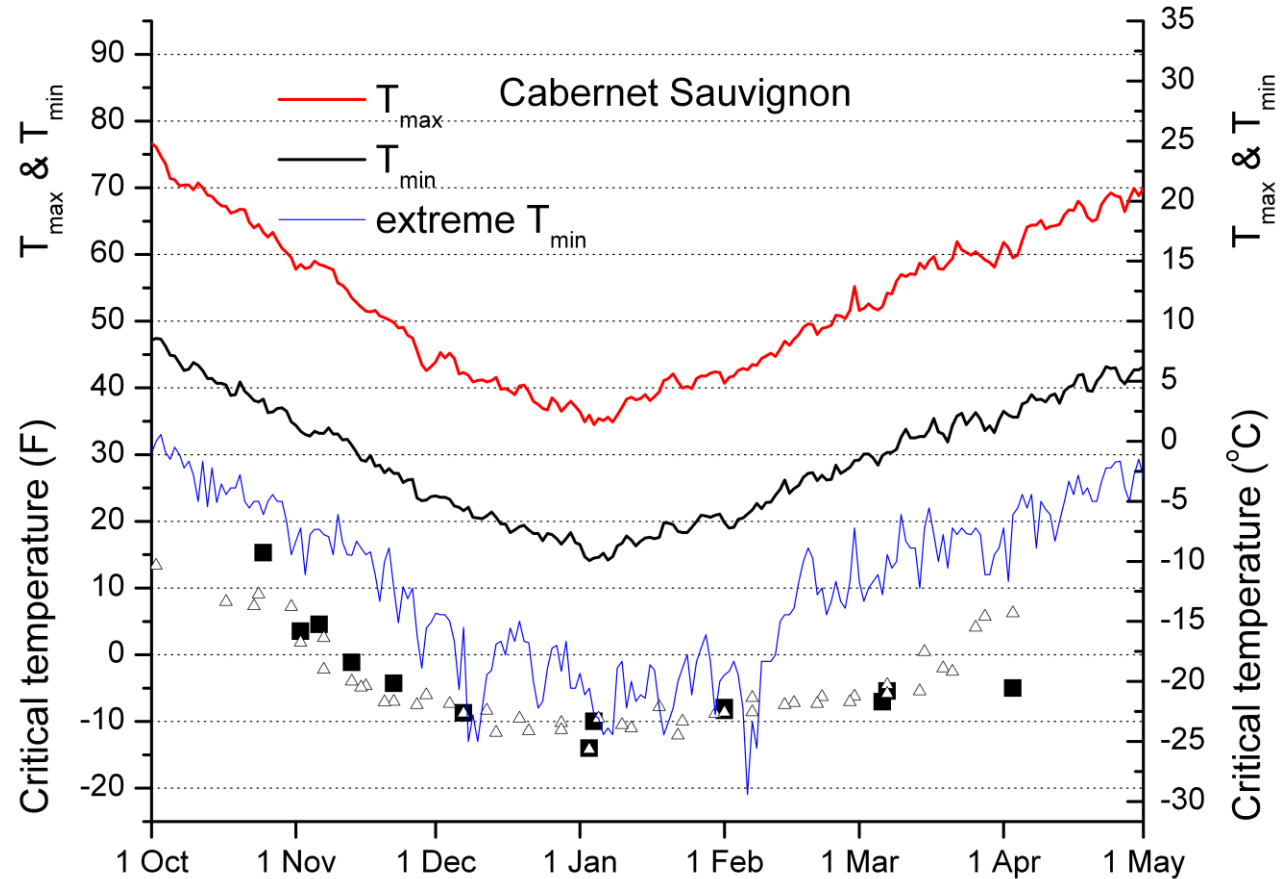
Long-term (1964-2018) average maximum, average minimum, and extreme minimum temperatures at the Orchard Mesa site as well as multi-year data of critical temperatures for a 50 % primary bud kill for Albarino (solid squares) compared to Chardonnay (open triangles).

## Bud cold hardiness, Cabernet Dorsa



Long-term (1964-2018) average maximum, average minimum, and extreme minimum temperatures at the Orchard Mesa site as well as multi-year data of critical temperatures for a 50 % primary bud kill for Cabernet Dorsa (solid squares) compared to Chardonnay (open triangles).

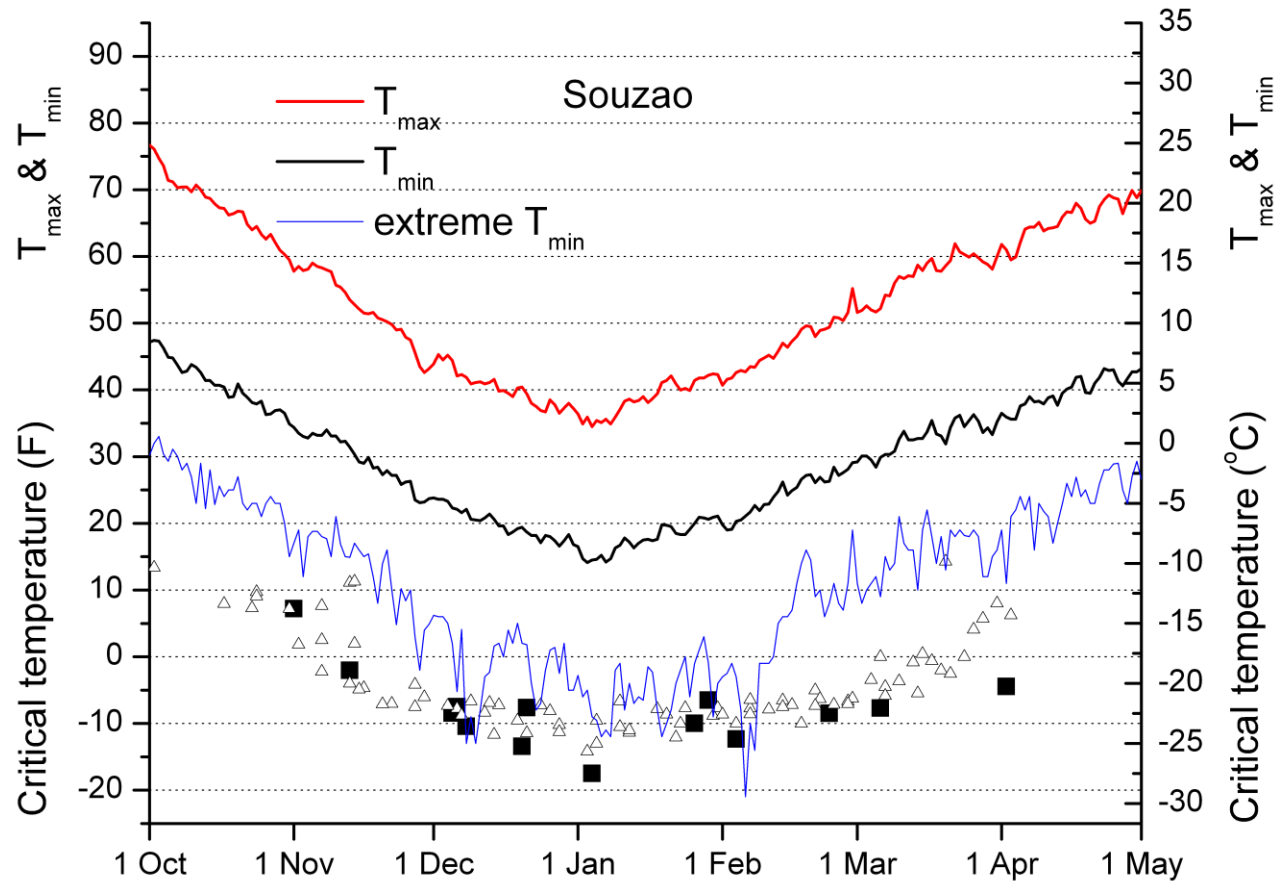
## Bud cold hardiness, Cabernet Sauvignon



Long-term (1964-2018) average maximum, average minimum, and extreme minimum temperatures at the Orchard Mesa site as well as multi-year data of critical temperatures for a 50 % primary bud kill for Cabernet Sauvignon (solid squares) compared to Chardonnay (open triangles).

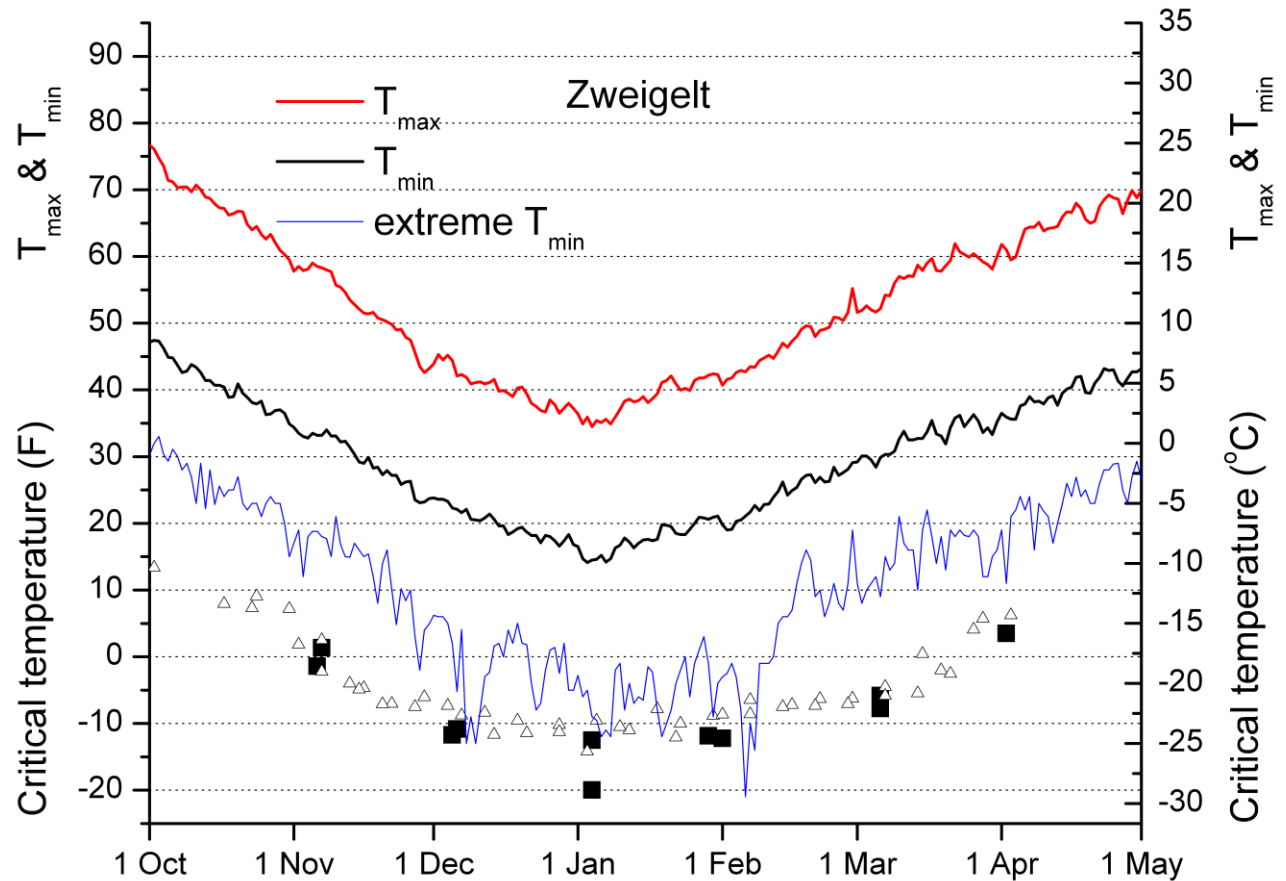


## Bud cold hardiness, Souzao



Long-term (1964-2018) average maximum, average minimum, and extreme minimum temperatures at the Orchard Mesa site as well as multi-year data of critical temperatures for a 50 % primary bud kill for Souzao (solid squares) compared to Chardonnay (open triangles).

## Bud cold hardiness, Zweigelt



Long-term (1964-2018) average maximum, average minimum, and extreme minimum temperatures at the Orchard Mesa site as well as multi-year data of critical temperatures for a 50 % primary bud kill for Zweigelt (solid squares) compared to Chardonnay (open triangles).



## Acknowledgement

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# Questions?

**Dr. Horst Caspari**

**Department of Horticulture & Landscape Architecture**

**Colorado State University**

**Western Colorado Research Center**

**Grand Junction, CO 81503**

**Ph: (970) 434-3264**

**[horst.caspari@colostate.edu](mailto:horst.caspari@colostate.edu)**