Performance of cool-climate grape varieties in Delta County

Horst Caspari
Colorado State University
Western Colorado Research Center

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Introduction

The vineyard area in Delta County increased substantially between 1990 and 2010.

The main varieties grown originate from cool-climate areas of Europe:

Pinot noir, Chardonnay, Gewürztraminer, Riesling

Grape variety trial at Rogers Mesa

In 2004, we started a variety and clonal trial at the Western Colorado Research Center – Roger Mesa.

Evaluation of several V. vinifera and cold-hardy, resistant varieties rarely used in Delta County.

Evaluation of Pinot noir clones.

Evaluation of irrigation / soil management systems.

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Pinot noir clonal trial at Rogers Mesa

Pinot noir clones: 02A, 09, 23, 29, 115, 236, 777, Geneva, Pernand

Also included in the planting were:
Dornfelder, Pinot Meunier, Malbec, Regent

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Grape variety trial at Rogers Mesa

White varieties:

Riesling, Rkatsiteli, Traminette, Valvin Muscat

Red varieties:

Chambourcin, Corot noir, Geneva Red, Noiret

Materials and Methods

Planted in 2004, with additions in 2006

All vines are own-rooted

Vine x Row spacing is 4’-6’ x 7’-8’

Cordon and spur

VSP

Drip irrigation with bare soil (2 reps) and sprinkler irrigation with perennial grass cover crop (2 reps)

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Materials and Methods

First crop in 2006

On 30 Nov, 2006 the minimum temperature was -9.9 F.

There was close to 100 % bud mortality on Dornfelder, Pinot noir, Regent, and Valvin Muscat.

Riesling and Rkatsiteli had about 50 % bud mortality.

Chambourcin had about 10 % bud mortality.

Corot noir, Geneva Red, and Noiret had 0 % bud mortality.

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Materials and Methods

In 2007, we had no crop on Dornfelder, Pinot noir, Regent, Traminette, and Valvin Muscat.

We would have had a full crop except for 100 % bird damage on Chambourcin, Corot noir, Geneva Red, Noiret.

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Materials and Methods

In the following years, minimum temperatures during dormancy were

-3.4 F (17 Jan 2008)
-0.2 F (15 Dec 2008)
-6.7 F (10 Dec 2009)
-9.8 F (3 Feb 2011)
-1.9 F (24 Dec 2011)
-11.8 F (15 Jan 2013)
-7.3 F (5 Dec 2013)

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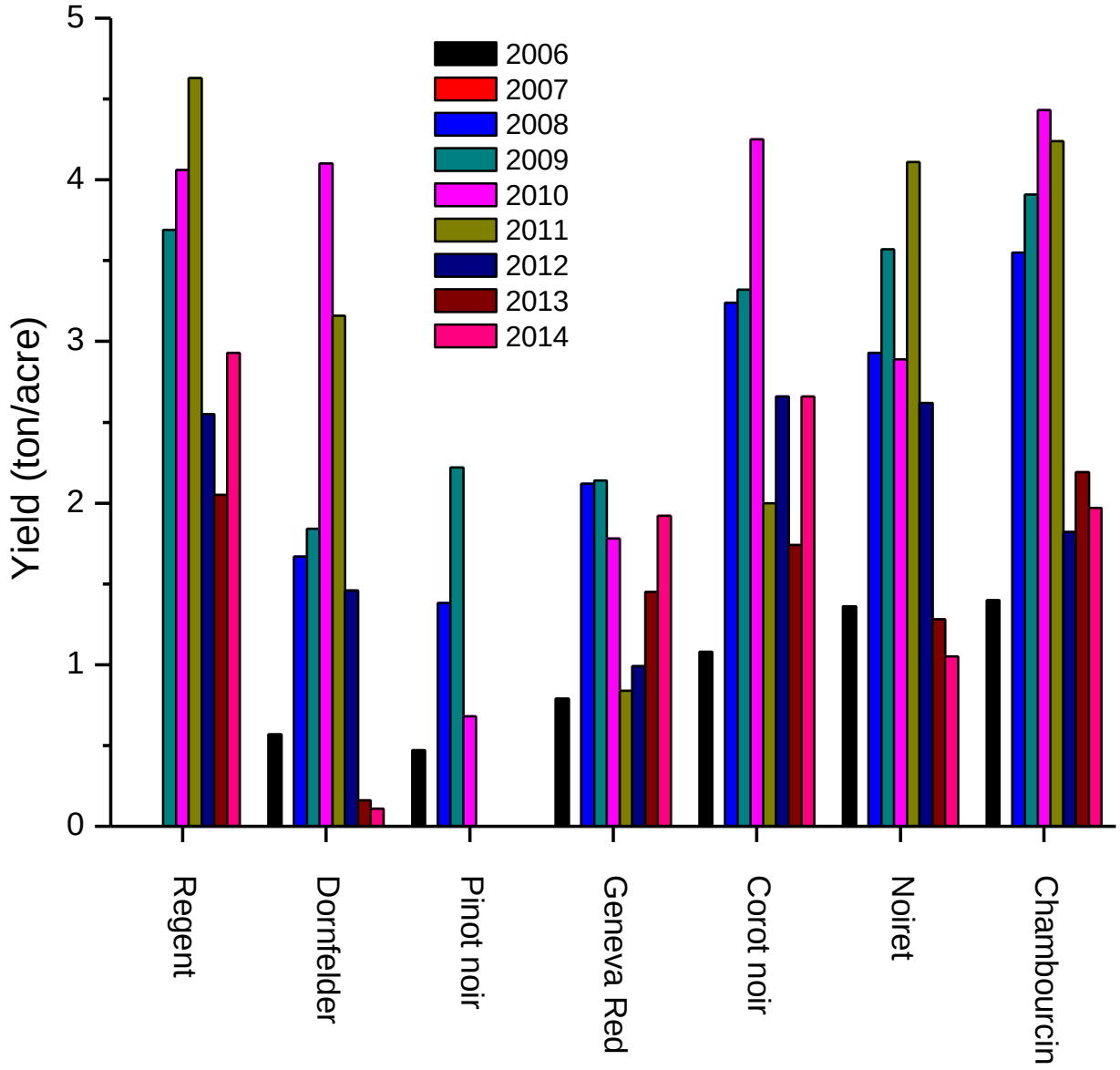
Results – red varieties



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Yield – red varieties

Yield (ton/acre)

	Chambourcin	Corot noir	Dornfelder	Geneva Red	Malbec	Noiret	Pinot Meunier	Pinot noir	Regent
2006	1.40	1.08	0.57	0.79		1.36		0.47	0
2007	n/a	n/a	0	n/a		n/a		0	0
2008	4.07	3.24	1.67	2.41	0	2.93	0	1.38	n/a
2009	3.11	3.32	1.84	2.15	0	3.57	1.75	2.22	3.69
2010	4.45	4.25	4.10	1.46	0	2.89	0.68	0.68	4.06
2011	3.87	2.00	3.16	0.80	0	4.11	0	0	4.63
2012	1.85	2.66	1.46	0.90	0	2.62	0	0	2.55
2013	2.19	1.74	0.16	1.45	0	1.28	0	0	2.05
2014	1.97	2.66	0.11	1.92	0	1.05	0	0	2.93
Ave.	2.86	2.62	1.45	1.49	0	2.48	0.41	0.53	2.49

Malbec and Pinot Meunier planted in 2006, all other varieties in 2004

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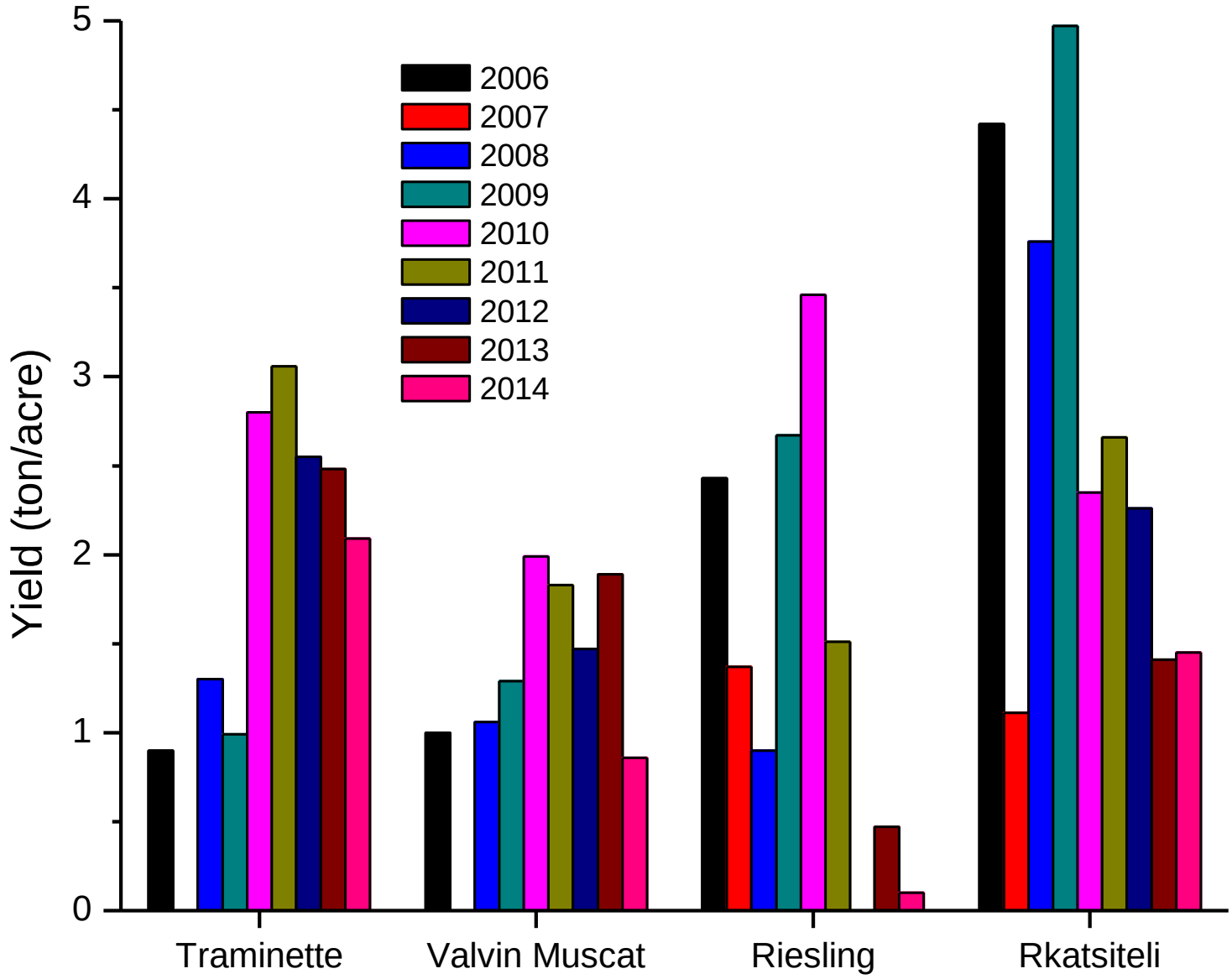
Results – white varieties



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Yield – white varieties

Yield (ton/acre)

	Riesling	Rkatsiteli	Traminette	Valvin Muscat
2006	2.43	4.42	0.90	1.00
2007	1.37	1.11	0	0
2008	0.90	3.76	1.30	1.06
2009	2.67	4.97	0.99	1.29
2010	3.46	2.35	2.80	1.99
2011	1.51	2.66	3.06	1.83
2012	0	2.26	2.65	1.47
2013	0.47	1.41	2.48	1.89
2014	0.10	1.45	2.09	0.86
Average	1.43	2.71	1.81	1.27

All varieties planted in 2004 as own-rooted vines.

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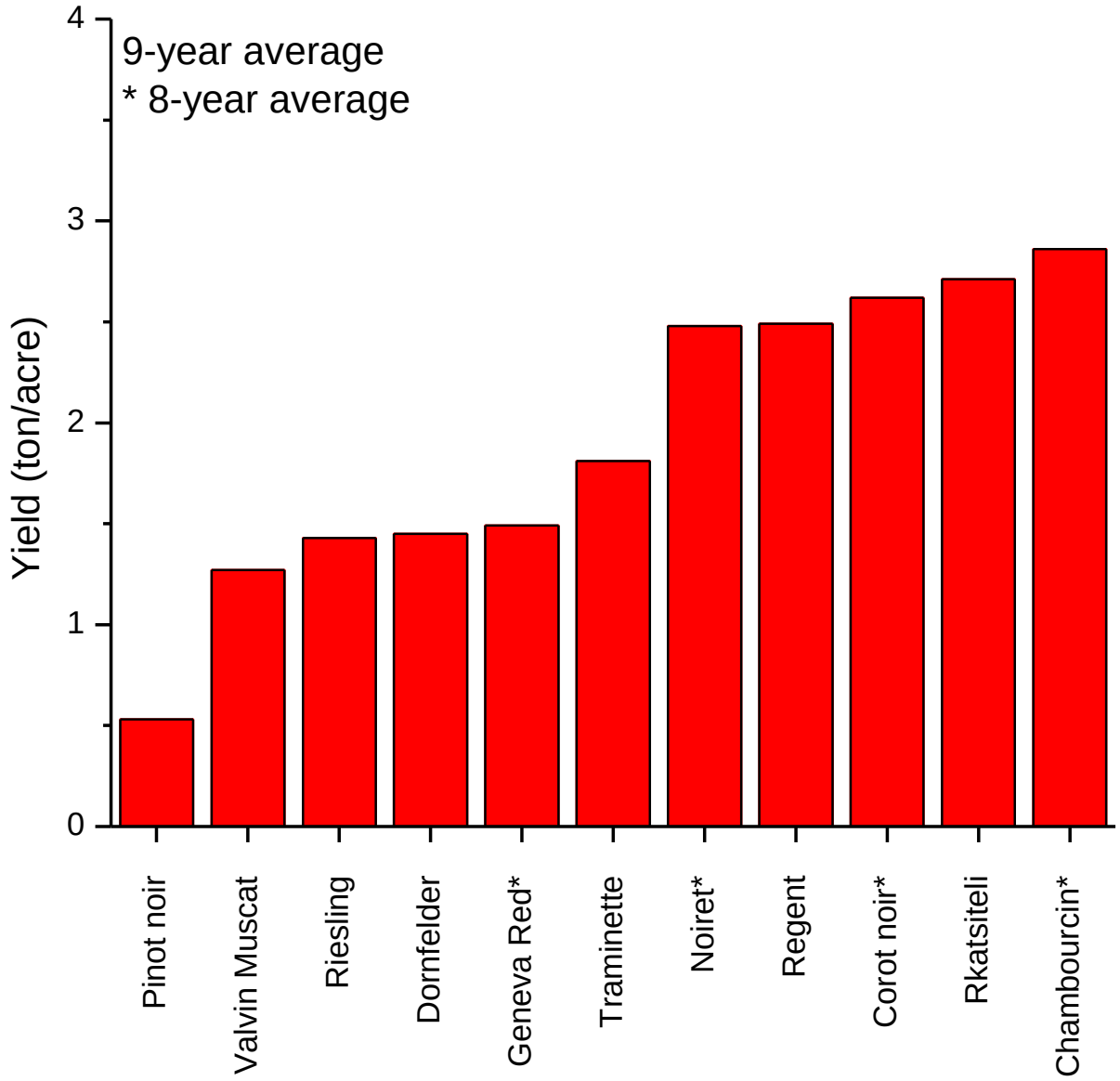
Results – 9-year average



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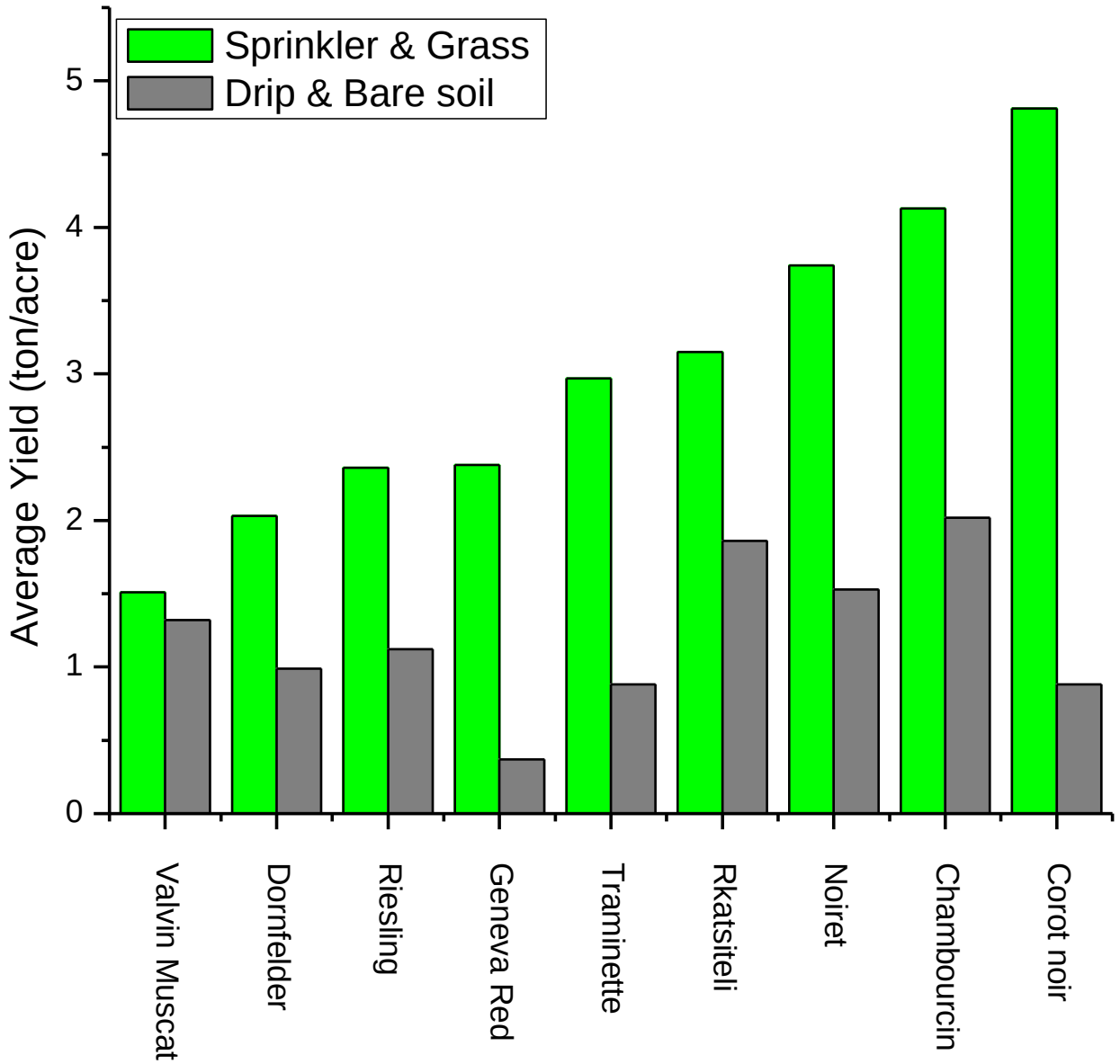
Soil & irrigation management

Comparison of two soil/irrigation treatments

- Drip irrigation with bare soil in the inter-row area
- Sprinkler irrigation with perennial grass cover crop in the inter-row area

Soil & irrigation management



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Summary - Yields

After 9 years the best performance is by Chambourcin and Rkatsiteli (2.7 to 2.8 ton/acre), followed by Corot noir, Regent, and Noiret (~2.5 ton/acre), then Traminette, Dornfelder and Riesling (1.4 to 1.8 ton/acre).

Except for Malbec, average yields were lowest for Pinot noir.

Malbec has never had a crop as all vines have died back to the ground every winter.

Initial yields of the white cold-hardy, resistant varieties were disappointing. However, over the last five years Traminette has averaged 2.6 ton/acre.

Summary – Cover crop / irrigation

Averaged across all years and all varieties:

The sprinkler irrigation / grass cover crop treatment has produced 2.3 times the yield compared to the drip / bare soil treatment.

Titratable acidity was always higher with sprinkler / cover crop (every variety, every year) – difference ~2 g l^{-1}.

Juice pH (~ -0.1) and soluble solids (~ -1.0) were generally lower with sprinkler / cover crop.

Performance of cool-climate grape varieties in Delta County – Part II

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Colorado State University
Western Colorado Research Center

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NE-1020 Variety trial at Rogers Mesa

In 2008, we started a new variety trial at the Western Colorado Research Center – Roger 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 cold-hardy, resistant varieties as well as new advanced breeding selections (MN, NY).

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NE-1020 Variety trial at Rogers Mesa

V. vinifera – Auxerrois, Bianchetta trevigiana, Blauer Portugieser, Grüner Veltliner.

Cold-hardy, resistant varieties – Chambourcin, Marquette, MN 1200, Aromella (NY 76.0844.24), NY 81.0315.17, Vidal.

NY 81.0315.17 is grafted to 101-14. All other varieties are own-rooted.

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Materials and Methods

Planted in 2008, with additions in 2009 (Chambourcin, MN1200, Marquette, Vidal)

Design: RCB (6 blocks, 4-vine plots)

Vine x Row spacing is 5’ x 8’10”

Cordon and spur

VSP for V. vinifera

High Cordon for hybrids

Drip irrigation with bare soil

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Materials and Methods

First crop in 2010 (on vines planted in 2008)

Several severe cold events occurred during the 2010/11 dormant season.

- On 1 Jan, 2011 the minimum temperature was -8.3 F.
- On 2 Feb, 2011 the minimum temperature was -9.8 F.
- On 10 Feb, 2011 the minimum temperature was -6.6 F.

Samples taken prior to 1 Jan, 2011 showed no bud damage to Chambourcin and Rkatsiteli. After 1 Jan, 2011 we found ~20 % primary bud damage on Chambourcin and ~33 % on Rkatsiteli.

Field samples taken on 9 Feb, 2011 showed 35-70 % dead primary buds on V. vinifera varieties, 20 % on Chambourcin, but no damage on NY 81.0315.17.

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Materials and Methods

The temperatures during the 2011/12 dormant season were rather mild with a winter minimum of -1.9 F (24 Dec).

Samples taken until late March 2012 showed minimal (<5 %) primary bud damage to Chambourcin and Rkatsiteli.

However, a late freeze event occurred on 7 April (21.8 F) and is thought to have caused significant trunk damage to NY 81.0315.17 (and Riesling in the adjacent block).

The minimum temperature during the 2012/13 dormant season was -11.8 F (15 Jan).

Samples taken until early April 2013 showed minor (5-15 %) primary bud damage to Chambourcin and Rkatsiteli.

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Materials and Methods

The minimum temperature during the 2013/14 dormant season was -7.3 F (5 Dec).

Samples taken until early April 2014 showed no primary bud damage to Aromella but 25-35 % primary bud damage to Chambourcin and Rkatsiteli.

Again, a late freeze event occurred on 14 April (21.1 F) and is thought to have caused significant trunk damage to NY 81.0315.17 (and Riesling in the adjacent block).

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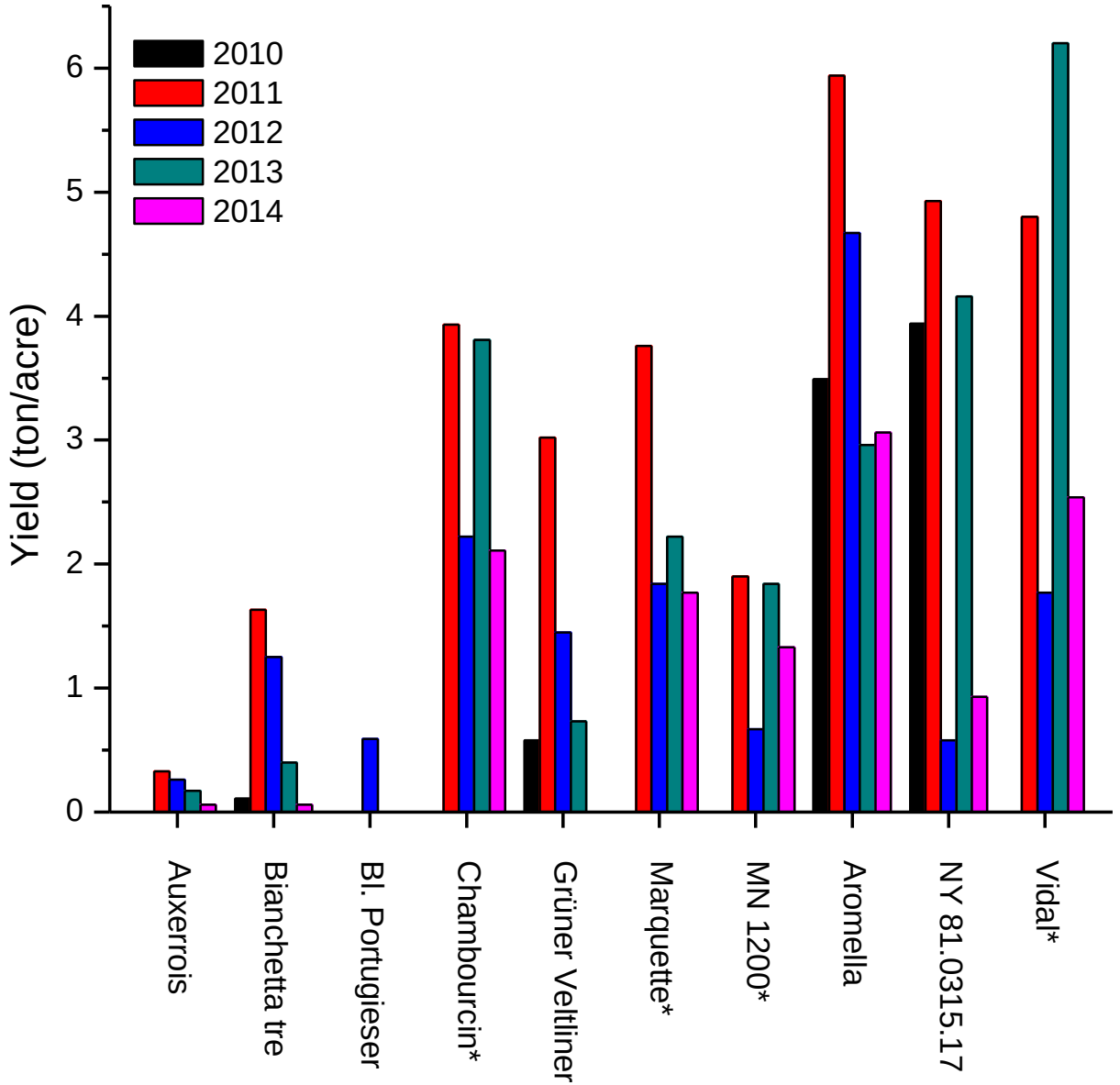
Cold? - Where? When?
Perfect bud break on Marquette in 2011

Results – Yields in years 3 to 7



* Chambourcin, MN 1200, Marquette, and Vidal were planted in 2009, all other varieties in 2008.

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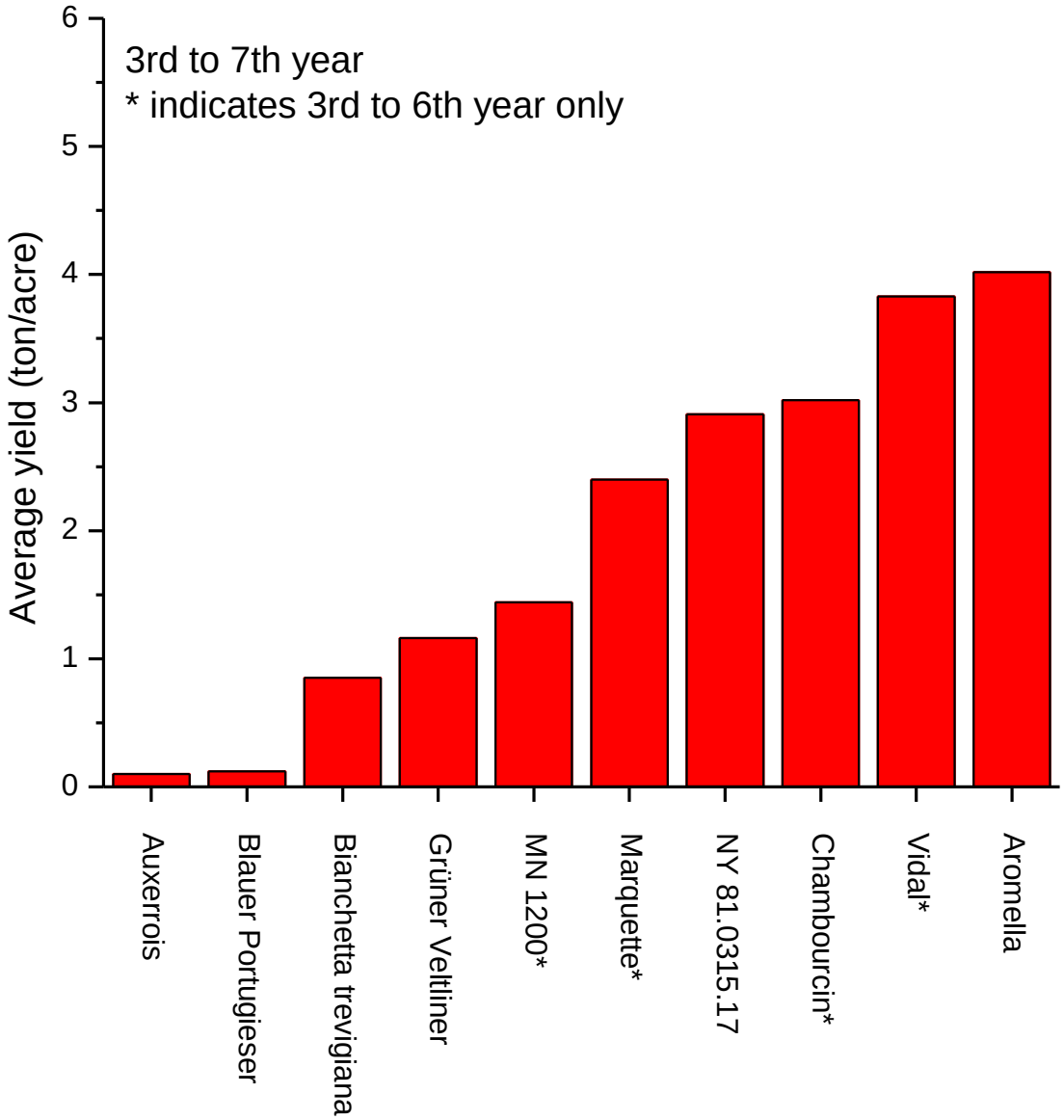
Results – 5-year average



* Chambourcin, MN 1200, Marquette, and Vidal were planted in 2009, all other varieties in 2008.

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Aromella (NY 76.0844.24)

NY76.0844.24 - (Traminette x Ravat 34) makes a top ranked floral, muscat wine. Own rooted vines have been highly productive, highly vigorous (24 lbs. of fruit/vine; 4.3 lbs. pruning weight average for '96-'03) and very winter hardy. Clusters are large and loose. Leaf phylloxera have been an occasional problem. Maturity is mid-season, ripening in mid-late September in Geneva.

Predicted temperature of 50% primary bud kill in mid winter = -16.8 F

www.nysaes.cornell.edu/hort/faculty/reisch/cultivars.html

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NY 81.0315.17

NY81.0315.17 - (Cayuga White x White Riesling) produces a floral and sometimes spicy light muscat wine. Highly rated for wine quality for several years. Only available grafted because own rooted vines have been small. *Botrytis* rot has been negligible and winter primary bud hardiness ranks better than Cayuga White (-12.0 F), and with many French-American hybrids.

www.nysaes.cornell.edu/hort/faculty/reisch/cultivars.html

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Harvest data 2013

	Harvest date	Yield (ton/acre)	Must pH	Must Brix	Must TA (g/l)
Bianchetta trevigiana	8 Oct 2013	0.40	3.53	21.3	4.11
Chambourcin	8 Oct 2013	3.81	3.31	24.5	9.35
Chambourcin*	8 Oct 2013	2.19	3.26	23.7	10.84
Grüner Veltliner	8 Oct 2013	0.73			
Marquette	6 Sep 2013	2.22	3.37	27.8	9.42
MN 1200	12 Sep2013	1.84	3.39	27.2	7.44
Noiret*	8 Oct 2013	1.28	3.49	23.3	6.47
Aromella	8 Oct 2013	2.96	3.29	23.9	7.86
NY 81.0315.17	25 Sep 2013	4.16	3.28	23.3	5.92
Riesling*	8 Oct 2013	0.47	3.10	23.3	6.12
Traminette*	2 Oct 2013	2.48	3.16	24.2	7.90
Vidal	8 Oct 2013	6.20	3.31	21.6	6.63

* Data included for comparison only. Vines are growing in an adjacent variety block planted in 2004, and are not part of the NE-1020 trial.

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Harvest data 2014

	Harvest date	Yield (ton/acre)	Must pH	Must Brix	Must TA (g/l)
Bianchetta trevigiana	24 Oct 2014	0.06			
Chambourcin	24 Oct 2014	2.11	3.23	24.0	11.28
Chambourcin*	24 Oct 2014	1.97	2.97	20.1	15.27
Grüner Veltliner		0			
Marquette	12 Sep 2014	1.77	3.15	26.4	12.77
MN 1200	12 Sep2014	1.33	3.23	26.0	9.06
Noiret*	24 Oct 2014	1.05	3.36	22.3	7.59
Aromella	24 Sep 2014	3.06	3.14	24.5	10.75
NY 81.0315.17	15 Oct 2014	0.93	3.25	22.8	6.60
Riesling*	24 Oct 2014	0.10			
Traminette*	15 Oct 2014	2.09	3.13	23.2	8.95
Vidal	15 Oct 2014	2.54	3.27	23.2	7.31

* Data included for comparison only. Vines are growing in an adjacent variety block planted in 2004, and are not part of the NE-1020 trial.

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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

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