

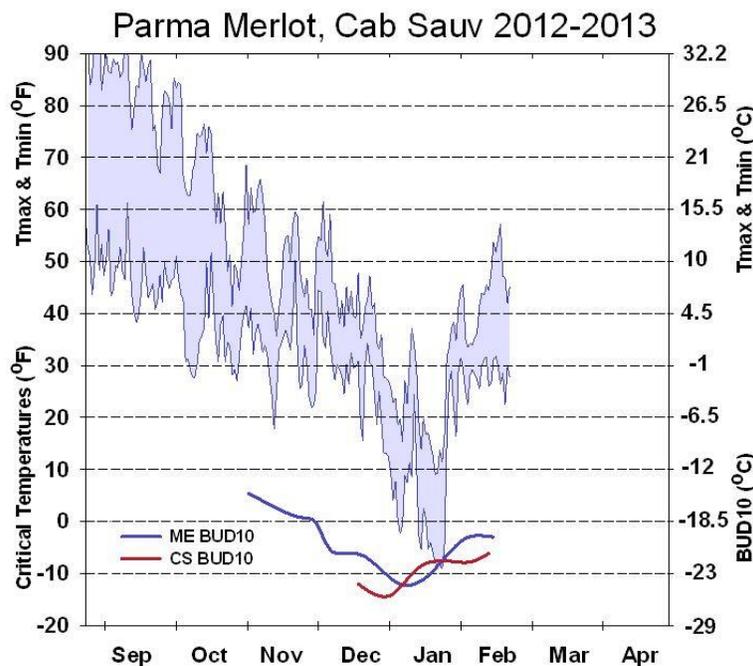
# Grapevine Cold Hardiness Monitoring

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Lethal cold temperatures for wine grape (*Vitis vinifera* L.) primary bud and phloem (inner bark) tissue, as determined by differential thermal analysis (1), are presented in the table below. The numbers in the table indicate the temperature (°F) at which intracellular ice was detected in primary buds and cane tissue. BUD10, BUD50 and BUD90 are the temperatures (°F) at which ice formed in 10, 50, and 90% of buds. PH10 is the temperature at which ice formed in 10% of canes tested.

Cold hardiness changes in response to local weather. Temperatures in this table reflect the hardiness of mature vines (node positions 4-7) grown at the University of Idaho Parma Research and Extension Center in Parma, ID or Sawtooth Vineyard in Nampa, ID. ***If temperatures in your vineyard have been colder than the vineyard test site, your grapevines could be more cold hardy than the stated temperatures. Likewise, if temperatures in your vineyard have been warmer than the vineyard test site, your grapevines could be less hardy.***

*USDA-ARS is not responsible for any damage resulting from the use or misuse of the temperature data represented below.*



Data will be updated periodically from mid-October through mid-April.

Date	Variety	Vineyard site	BUD10 °F	BUD50 °F	BUD90 °F	PH10 °F
2/21/13	Barbera	Parma, ID	-8.0	-11.5	-13.5	9.5
2/21/13	Sangiovese	Parma, ID	-5.5	-7.5	-11.0	11.5
2/21/13	Lemberger	Parma, ID	-7.0	-11.5	-14.0	11.0
2/21/13	Grenache	Parma, ID	-7.0	-11.5	-14.0	11.0
2/21/13	Dolcetto	Parma, ID	-7.5	-11.0	-13.5	13.5
2/21/13	Nebbiolo	Parma, ID	-12.0	-13.0	-15.5	9.0
2/19/13	Pino Noir	Parma, ID	-4.0	-9.0	-11.5	11.5
2/19/13	Viognier	Parma, ID	-4.0	-8.0	-12.0	10.5
2/19/13	Valdepenas	Parma, ID	-3.0	-6.0	-9.0	9.5
2/19/13	Petite Syrah	Parma, ID	7.0	3.0	-4.5	7.5
2/19/13	Cab Franc	Parma, ID	-4.0	-11.0	-13.5	9.0
2/19/13	Syrah	Parma, ID	-7.0	-10.5	-13	11.5
2/12/13	Merlot	Parma, ID	-3.0	-7.0	-11.5	3.0
2/11/13	Cabernet Sauv	Parma, ID	-6.0	-11.5	-14.5	2.5
2/11/13	Chardonnay	Parma, ID	-10.0	-14.5	-16.0	1.0
2/5/13	Malbec	Parma, ID	-3.5	-8.0	-11.5	2.0
1/29/13	Merlot	Parma, ID	-3.5	-7.5	-11.5	2.0
1/28/13	Cabernet Sauv	Parma, ID	-8.0	-12.5	-15.5	-2.5
1/28/13	Chardonnay	Parma, ID	-11.0	-13.5	-15.5	-2.5

*Last updated 3:11 p.m. 2-25-13 by Alan Muir*

1. Mills, L., J. Ferguson, and M. Keller. 2006. [Cold-hardiness evaluation of grapevine buds and cane tissues](#). Am. J. Enol. Vitic. 57:194-200.

2. Ferguson, J.C., J.M. Tarara, L.J. Mills, G.G. Grove, and M. Keller. 2011. Dynamic thermal time model of cold hardiness for dormant grapevine buds. *Annals of Botany* 107:389-396.