



LODI WINE  
WINEGRAPE  
COMMISSION

# IN THE VINEYARD

## Seeing a lack of or stunted growth?

Cold Damage Report

SPRING 2021



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## LODI GROWERS VITICULTURE BLOG

New articles are posted **every Monday** – contributors include Stan Grant, Randy Caparoso, and many others.

[lodigrowers.com](http://lodigrowers.com)

## GROWER EDUCATION

Lodi Winegrape Commission events are shared via postcards, emails, and our website. Sign up by sending an email to [info@lodiwine.com](mailto:info@lodiwine.com). Visit [lodigrowers.com](http://lodigrowers.com) and check out the Calendar to find grower meetings hosted by the Commission or click on Education, then Local Opportunities to see all grower meetings available. You can also call 209.367.4727 to learn about what's coming up or share an idea for a meeting.

## LOCAL WEATHER NETWORK

Custom daily forecasts based on 37 local weather stations hosted on farms are provided free of charge to the Lodi winegrowing community. Sign up to receive a daily forecast by sending an email to [matt@westernwx.com](mailto:matt@westernwx.com).

[lodi.westernweathergroup.com](http://lodi.westernweathergroup.com)

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Contact the Lodi Winegrape Commission to update your mailing address, add a new person to the mailing list, etc. 209.367.4727 or [info@lodiwine.com](mailto:info@lodiwine.com)

## RESEARCH, EDUCATION & COMMUNICATION (REC) COMMITTEE

The REC Committee meets every other month at the Lodi Winegrape Commission office. View meeting minutes, agendas, and see when the next meeting is by visiting [lodigrowers.com](http://lodigrowers.com). All are welcome.

## CD11 LODI IPM NETWORK BREAKFAST MEETINGS

On the **first Tuesday of the month** at 8am, we host a breakfast meeting where growers, pest control advisors, and others come together to discuss pests, diseases, and other viticultural topics of interest. This meeting also provides an opportunity to earn DPR continuing education hours.

[lodigrowers.com/calendar](http://lodigrowers.com/calendar)

# LODI GROWERS REPORT VINE GROWTH PROBLEMS FROM FALL 2020 COLD DAMAGE

BY TED RIEGER



*A lack of new spring growth on Chardonnay. Above and cover photos courtesy of Lodi Grower Bruce Fry, Mohr-Fry Ranches.*

Some Lodi winegrape growers are reporting grapevines and vineyard blocks with no vine growth or stunted vine growth this spring that appear to be related to cold injury damage experienced during an unusual cold weather event that occurred November 8-12, 2020 when overnight/morning temperatures dropped below freezing throughout most of the Lodi AVA.

Although the cold event occurred post-harvest with no impact on the 2020 crop, most vines were not yet dormant, and it is believed that vines had not become seasonally acclimated to prevent cold damage to vascular tissues. Younger and more recently planted vines were more susceptible, however damage has also been observed in vineyards up to 20 years-old.

This cold event occurred over much of the northern San Joaquin Valley and Sacramento Valley, and growers have reported similar damage in walnut orchards and olive groves this spring.

## NOVEMBER COLD EVENT SPANNED FIVE DAYS

Based on archived data for the Lodi Weather Station Network’s Daily Meteorological Summary of 37 weather stations, temperatures of 32°F (0°C) and below were recorded at some stations for five consecutive days from Sunday, November 8, 2020 through Thursday morning November 12, 2020. Minimum daily temperatures for four station locations that recorded among the lowest temperatures over the five-day period appear below.

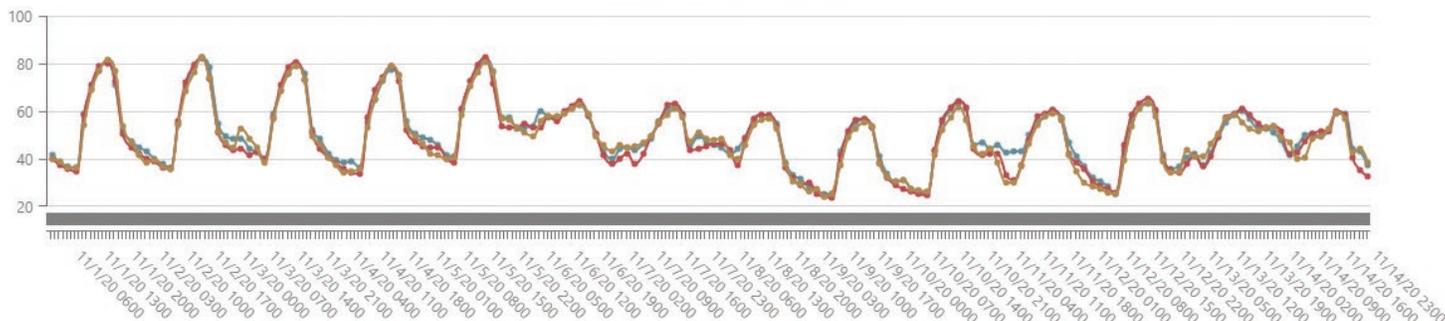
STATION	TEMPERATURES
ACAMPO	28.5°F, 24.5°F, 24.6°F, 34.4°F, 25.4°F
LINDEN	27.8°F, 22.8°F, 24.2°F, 29.4°F, 25.9°F
LONE OAK (CLEMENTS HILLS AVA)	24.8°F, 22.7°F, 23.4°F, 27.4°F, 25.3°F
SLOUGHHOUSE	26.7°F, 22.3°F, 25.2°F, 27.4°F, 24.2°F

Oddly enough, daily maximum temperatures during this same period were around the seasonal normal, ranging from 58.4°F (14.7°C) to 67.8°F (19.9°C) across the Lodi Weather Network.

### Temperature (°F)

11/1/2020 - 11/14/2020

Acampo Linden Sloughhouse



Temperatures from the Acampo, Linden, and Sloughhouse weather stations between November 1-14, 2020. Courtesy of Will Farr, Lead Meteorologist, Western Weather Group. In email communications, Will warned of the chill that can accompany a wildfire vintage: “Smoke is very effective at blocking the incoming shortwave radiation from the sun so it stayed in the 40s/50s during the afternoons [at the time of the 2018 Camp Fire], but it’s not very good at holding in longwave radiation escaping the surface at night in the way that clouds do. As a result, the temperature was allowed to cool at night almost as if there were no clouds at all.” We didn’t find any evidence to indicate that the November 2020 cold damage was a result of what Will calls “wildfire-induced frost”, but it is something to consider and understand for future vintages.

## LODI COLD DAMAGE REPORTS

Aaron Lange, VP of vineyard operations at LangeTwins Family Winery and Vineyards, said the situation was not a widespread disaster, but observed damage tended to be in younger vineyards and in cane pruned vineyards. “We believe the vines did not have enough opportunity last fall to acclimate for winter cold hardiness, and they had not completed their transition to full dormancy,” Lange said.

Lange reported a 50-acre block of Sauvignon blanc planted in 2019 had sustained significant damage. The vines had been trained onto trellis wire in 2020 and were expected to produce the first crop in 2021. Now the vines will have to be cut back and retrained, costing additional labor and resulting in a year of lost production.

Lange also reported cold injury in mature Pinot noir and Pinot gris vineyards in the Delta, in blocks up to 15 years-old. In mature vineyards, the cold damage affected buds that would have produced shoots and clusters and will result in crop losses and reduced yields this season.

Viticulture consultant Stan Grant with Progressive Viticulture has seen, or heard reports of, cold injury this spring in vineyards ranging geographically from Elk Grove in the north to Livingston in Merced County in the south, and from the Delta area near Brentwood in the west to about Highway 88 on the east side of Lodi. Grant has seen cold injury in Central Valley vineyards at different times during his career. He observed that the degree of cold damage can vary widely and its occurrence is quite random. "Sometimes damage can occur throughout a whole block, and sometimes it may be just a few vines in a low spot in the vineyard where the coldest air settles," Grant said.

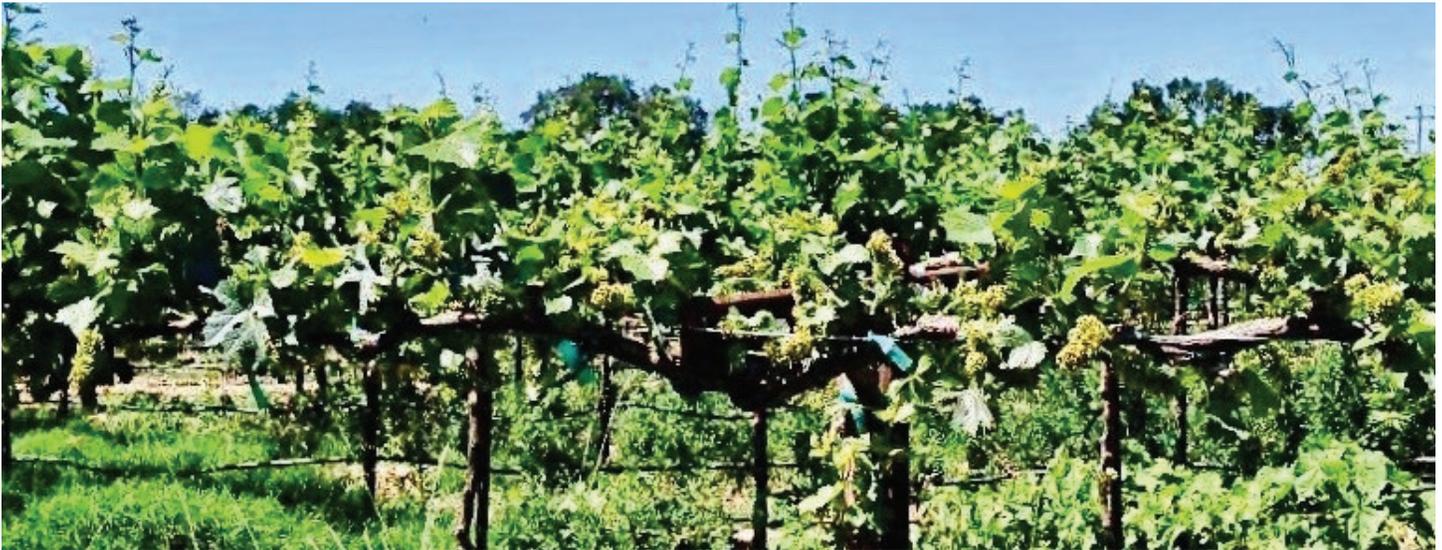
Although not considered a common occurrence in the Lodi area, cold injury may be a cause of restricted spring vine growth more than growers realize, because it may not always be diagnosed as the cause. "There can be restricted spring vine growth due to a number of causes, and sometimes you have to do more investigation and go through a process of elimination," Grant said. Damaged vine tissue can be detected by peeling bark or outer vine layers, or by pruning vine parts, to reveal brown vascular tissue. This internal tissue damage can be visible soon after a cold event, but most growers won't notice a problem until spring when the vine does not properly push new growth. Lodi growers started seeing problems in late April when damaged vines were not keeping pace with healthy vines.

Younger, more recently planted vines tend to be more susceptible to cold damage, partly due to their smaller size. Grant also observed, "Young vines tend to remain active later into the growing season and fall, which makes them more susceptible to cold damage." However, Grant also observed cold damage in a 20 year-old Chardonnay vineyard this year.

Jason Eells, vineyard manager for Arbor Vineyards, reported damage to about half of a 48-acre block of Sauvignon blanc planted in 2019 in the Jahant area. "The vines were trained onto the wire last year, and we were expecting our first crop this year, but about half the vines have no green growth at all," Eells said. The plan is to cut the damaged vines and retrain this season with new growth from above the graft union. He also found less severe damage in another Sauvignon blanc vineyard about two miles away that has a section with stunted green growth. This vineyard will be managed with more of a wait and see approach, with shoot thinning and growth management, but with lower yield expectations.



*Peeling back the bark shows brown vascular tissue in cold-damaged Sauvignon blanc planted in 2019 in Lockeford. Photos taken on April 21, 2021, and courtesy of Charlie Starr IV, Pest Control Advisor and Lodi Grower.*



A lack of new spring growth on Chardonnay. Above and cover photos courtesy of Lodi Grower Bruce Fry, Mohr-Fry Ranches.

In addition to the Sauvignon blanc, Pinot noir, Pinot gris, and Chardonnay already mentioned, other varieties reported to have sustained cold damage include: Albariño, Cabernet Sauvignon, Tannat, and Zinfandel. Vineyard site conditions, temperature severity and timing were most likely the main factors contributing to cold damage. Anecdotally, some believe that Mediterranean *Vitis vinifera* varieties planted in the Lodi AVA may be more susceptible to cold damage.

## PHYSIOLOGY OF COLD DAMAGE

Lange contacted viticulture research/extension advisors with Cornell University in upstate New York, who have more experience with fall and winter cold injury in vineyards. Dr. Terry Bates, director of the Cornell Lake Erie Research and Extension Laboratory, provided the following information regarding cold damage to grapevine phloem and xylem tissues: "These tissues prepare for cold acclimation through controlled dehydration and accumulation of cryoprotectant substances (sugar-protein molecules) to bind any free water molecules and prevent ice formation. Any free water in these tissues during a low temperature event will form ice crystals, damage cell membranes, and split trunks."

It is believed that late season irrigations, done by some Lodi growers last fall into November to maintain root moisture during dry fall conditions, could have contributed to cold damage. According to Bates: "Even without leaves on the vine to draw water up by transpiration, there is a significant amount of solutes in the roots causing root water pressure to send up the trunk and cordon xylem vessels. This would have provided enough free water to freeze in the trunks and cordons and cause vascular damage, trunk cracking, xylem streaking, and entry points for eutypa and crown gall."



Cold damage symptoms of brown tissue (left) and no green growth (right) in Cabernet Sauvignon planted in 2020 in the Lodi AVA. Photos taken on April 19, 2021 and courtesy of Charlie Starr IV, Pest Control Advisor and Lodi Grower.

When considering late fall irrigations in the future, Bates advises looking at the 7-10 day weather forecast in the fall and not irrigating if temperatures are expected to drop into the 20s.

## TREATMENT OF COLD DAMAGED VINES

Vine treatments to address cold damage will differ based on the degree of the damage and should be approached on a vine by vine basis. Unless the entire vine has sustained permanent damage, the vine has a chance to recover and be saved.

In cases of milder damage, when some green growth is observed, it may be better to wait and see if the vine recovers during the season, although there may be no crop, or a very small crop from such vines this season. Bates explained, "If you had partial vascular tissue damage in the fall, you will have spotty bud push that should eventually recover when the cambium produces new vascular tissue, but you will need to baby the vines through it." But he also cautioned, "In this situation, the shoots can start growing and then suddenly collapse because the old damaged vascular tissue can't keep up with the water demand."

In more severe cases, vine surgery and retraining may be required. Bates said: "If you had complete vascular tissue damage in the fall, you will have blank buds and there will be no stimulus to reactivate the cambial tissue. Prune it out and retrain." To do this, he advised: "Pick the lowest viable shoots on the trunk above the graft union and retrain the vine. The lowest shoots will have the best chance of working off of old xylem and phloem connections with the root system and the shortest distance for new vascular development from the reactivated cambial tissue. There will be no longer-term damage because the vascular cambium will build new xylem and phloem."

More detailed references on grapevine cold damage, causes, assessment, and treatments are listed to the right.



Cold damage, a lack of winter soil moisture, or a combination of factors? Photo of Pinot noir planted in 2017 in the Delta, courtesy of Daniel Meyers with Vino Farms.



Stunted growth on Chardonnay vines planted in 2014. Photo taken on May 11, 2021 and courtesy of Lodi Grower Bruce Fry, Mohr-Fry Ranches.

"November 2020, Another Major Autumn Freeze in California Walnuts" by Luke Milliron and Janine Hasey. UC-ANR Sacramento Valley Orchard Source Walnuts Blog. May 3, 2021.  
<http://www.sacvalleyorchards.com/blog/walnuts-blog/november-2020-freeze/>

"Winter Injury to Grapevines and Methods of Protection" by Thomas J. Zabadal, Imed E. Dami, Martin C. Goffinet, Timothy E. Martinson, and Mark L. Chen. Michigan State University Extension Bulletin E2930. June 2007.  
[https://www.researchgate.net/publication/242395839\\_Winter\\_Injury\\_to\\_Grapevines\\_and\\_Methods\\_of\\_Protection](https://www.researchgate.net/publication/242395839_Winter_Injury_to_Grapevines_and_Methods_of_Protection)

"Assessing and Managing Cold Damage in Washington Vineyards" by Michelle Moyer, Lynn Mills, Markus Keller, and Gwen Hoheisel. WSU Extension EM042E. September 2011.  
<http://pubs.cahnrs.wsu.edu/publications/wp-content/uploads/sites/2/publications/em042e.pdf>

"May 2021 1MC and Freeze Damage in Walnut." UCCE Growing the Valley Podcast. May 6, 2021.  
<https://www.growingthevalleypodcast.com/podcastfeed/1mcmay21>



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**MISSION:**

To empower all Lodi Crush District 11 winegrowers and serve their common interests to enhance the profitability of winegrape production through promotion, research, and education.