

Strategies and Tactics for Wine Grape Production in a Changing Environment

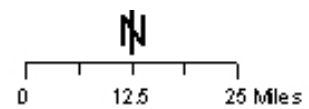
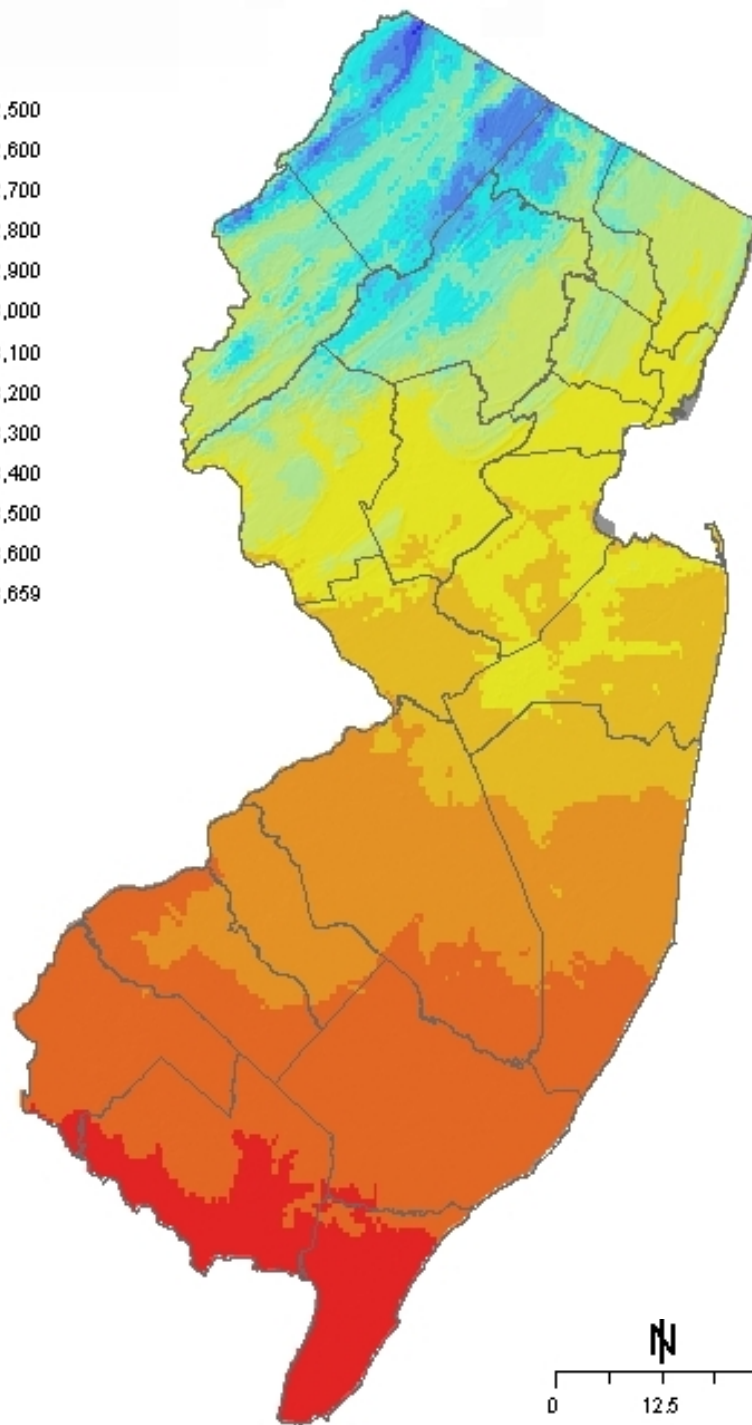
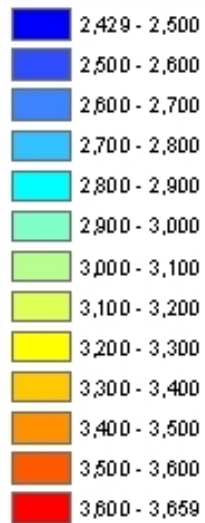
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New Jersey Center for Wine Research and Education



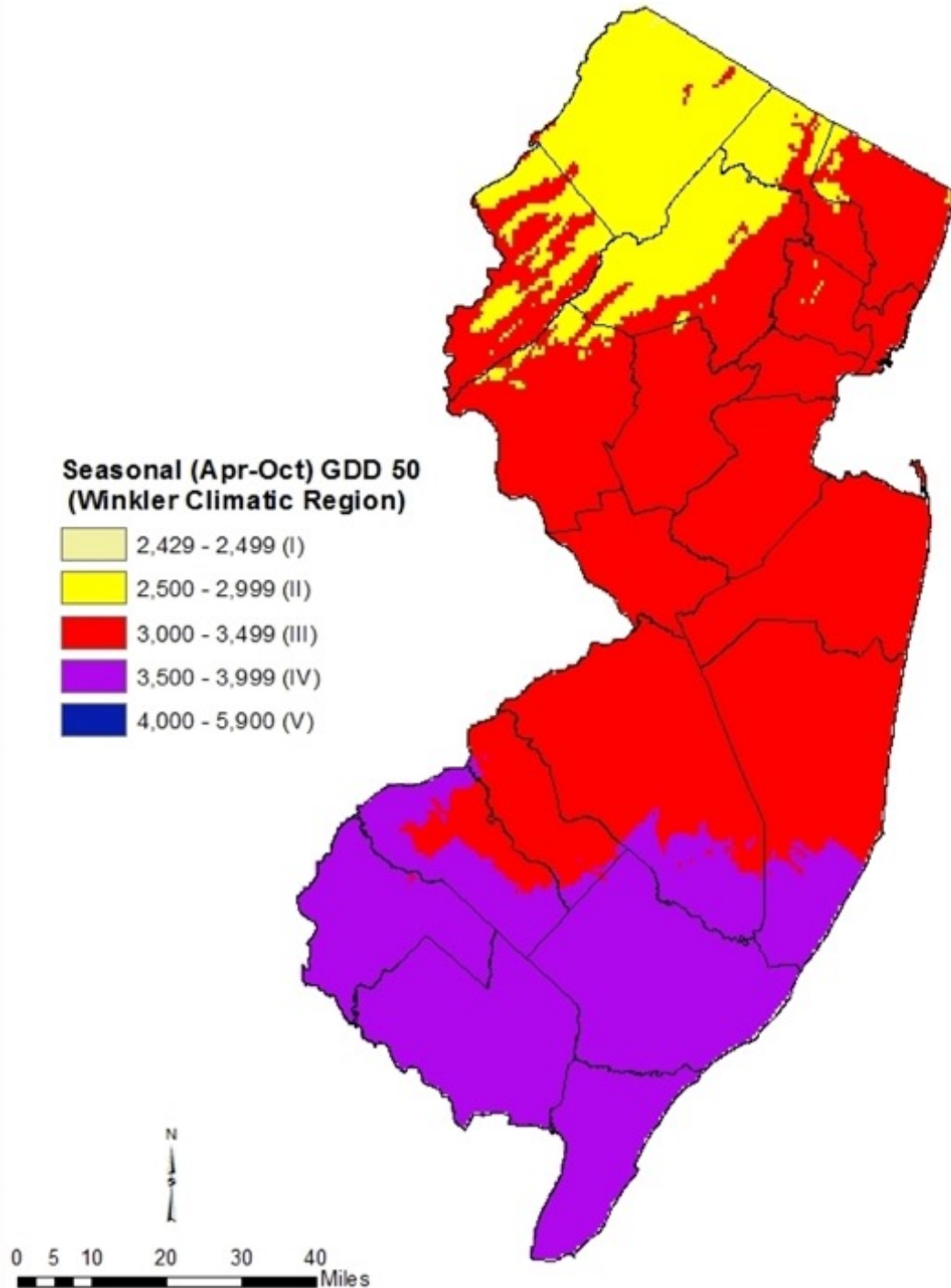
Growing Degree Days

Growing season, base 50 F



Winkler Climatic Regions in New Jersey

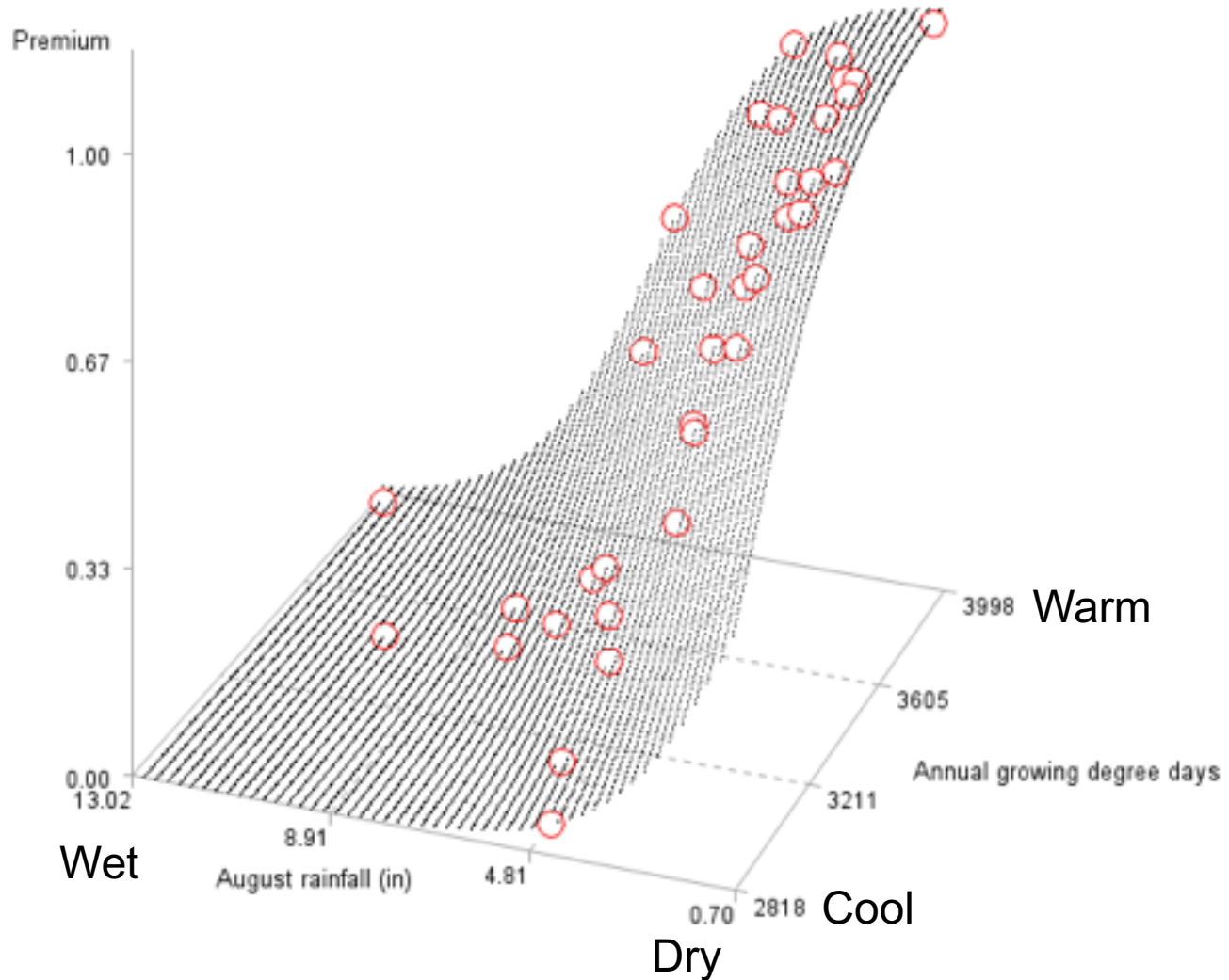
Amerine and Winkler (1944, 1963)



Climate Factors Affecting Vintage Quality in NJ

Data from 36 years of Cabernet Sauvignon

Predicted Probabilities for Premium Vintage, or better



Increased frequency of extreme weather events:

- rainfall and flooding,
- high winds,
- hail,
- drought,
- fluctuating cold temperatures.

How much can the plants tolerate? , and

How much can the grower tolerate?

Cool damp nights during bloom is one of the causes of coulure.



Hail damages fruit directly and also hastens disease spread.



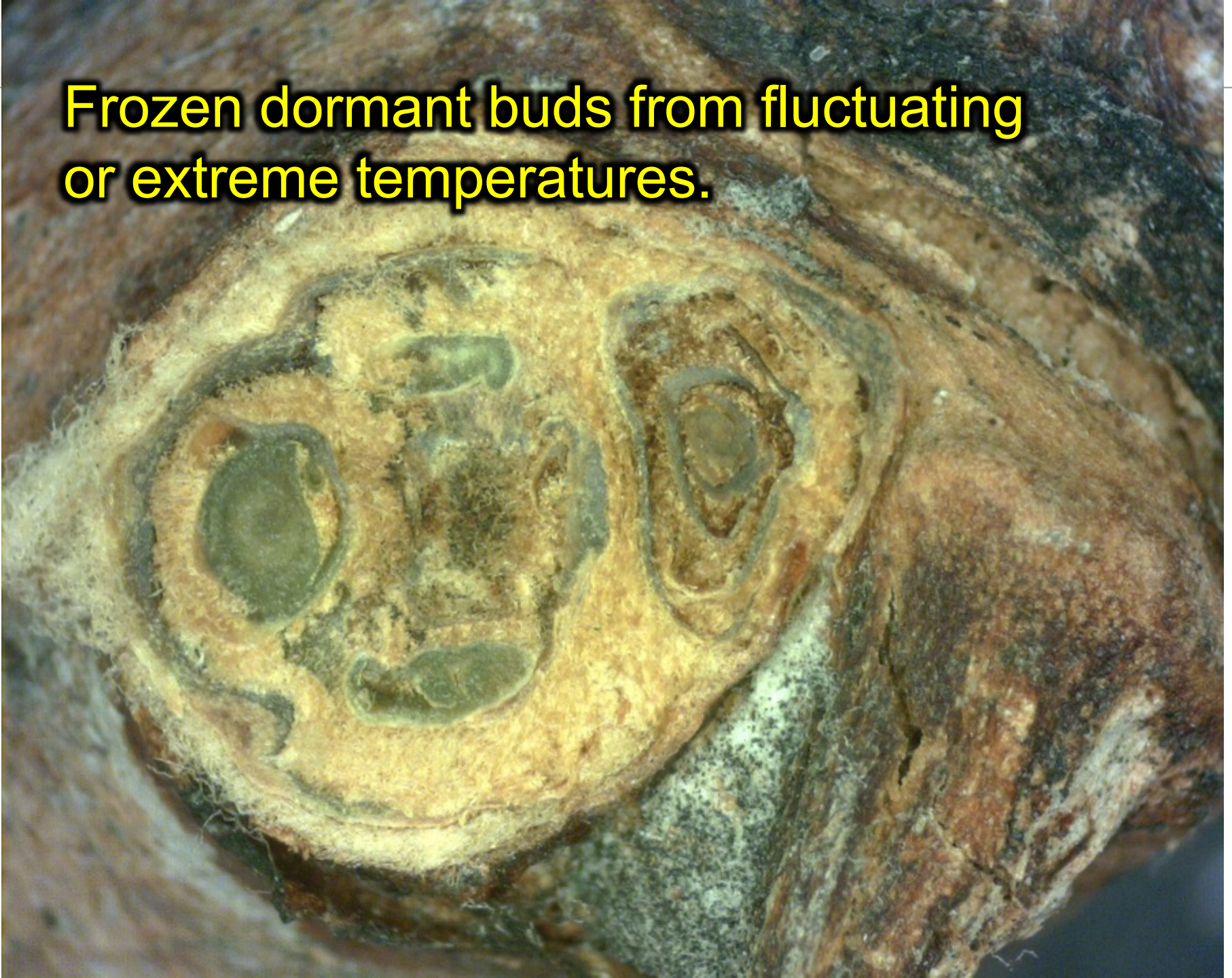
Young fruit damaged by hard rain.



**Hard rain at a
bad time.**



**Frozen dormant buds from fluctuating
or extreme temperatures.**



Frozen wood killed the scion variety, rootstock still alive.



Strategies to adapt to a changing climate:



Planting of cultivars of the same species that are important in other regions, but now have potential in your region either for A) quality, or B) survival.



Utilizing cultural practices from lower and higher latitudes to manage challenges from unusual or extreme events.



Protected culture options, not for season extension, but for protection from untimely extreme events.

**Delayed dormant pruning to
delay bud break.**



Photo credit: Pete Nitzsche



**Roughly-pruned
Chardonnay vines.
Leaving excess buds
to select from later.**

**Growing spare parts to replace
any damaged parts of the vine.**



**Growing spare parts to replace
any damaged parts of the vine.**



Growing a renewal trunk to replace a trunk, should winter injury occur.



Covering the graft union with soil to protect from losing the vine to winter injury.

A photograph of a vineyard during autumn or winter. In the foreground, a black plastic mulch strip is being covered with dark soil to protect the graft union of a young vine. The vine is supported by a wooden stake. The background shows rows of vines in a field with a trellis system. The ground is covered with green grass and fallen brown leaves.

Photo credit: Hemant Gohil

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**Crown gall
damage on
unprotected
trunk**

**Replacement
trunk**

**Depth to
which soil
was hilled
up**

**Protected
trunk with
no crown
gall damage**

Graft union



Selective leaf pulling to prevent sunburn and provide some cover from hard rains.



Drip irrigation for establishment and efficient watering during drought.



Rain shelters to provide protection from rains.



A few more actions:

- **Grower:** Adjust crop load, green harvest, change harvest timing.
- **Wine makers:** Modify wine style, Re-sort, Reverse Osmosis, Low pressure evaporation, Freeze concentrate
- **Consumers:** Pay more for your products!

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Questions and Comments

