

Understanding Dormancy and Cold Hardiness

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TEXAS A&M
AGRILIFE
EXTENSION

**Viticulture
and Fruit Lab**

What is Dormancy

Phase of Arrested Plant Growth
(Bud Dormancy)

- Visible Growth Stops
- Metabolic Activity is Minimized
- Necessary 1st step to Establish Hardiness
- Allows Plants to Survive Adverse Conditions

What is Hardiness

Plants Capacity to survive an adverse condition

- Cold Temperatures
- Drought
- pH
- Salinity
- Anaerobic conditions

CATEGORIES OF DORMANCY

- Predictive Dormancy
- Consequential Dormancy
- Paradormancy

Predictive Dormancy

Utilized to protect against unfavorable environmental conditions that are predictable

ENDODORMANCY

Initiated by change in daylength

Released by Accumulation of Chill

Consequential Dormancy

Utilized to protect as a consequence of or in response to unfavorable environmental conditions

ECODORMANCY

Initiated adverse conditions (cold)

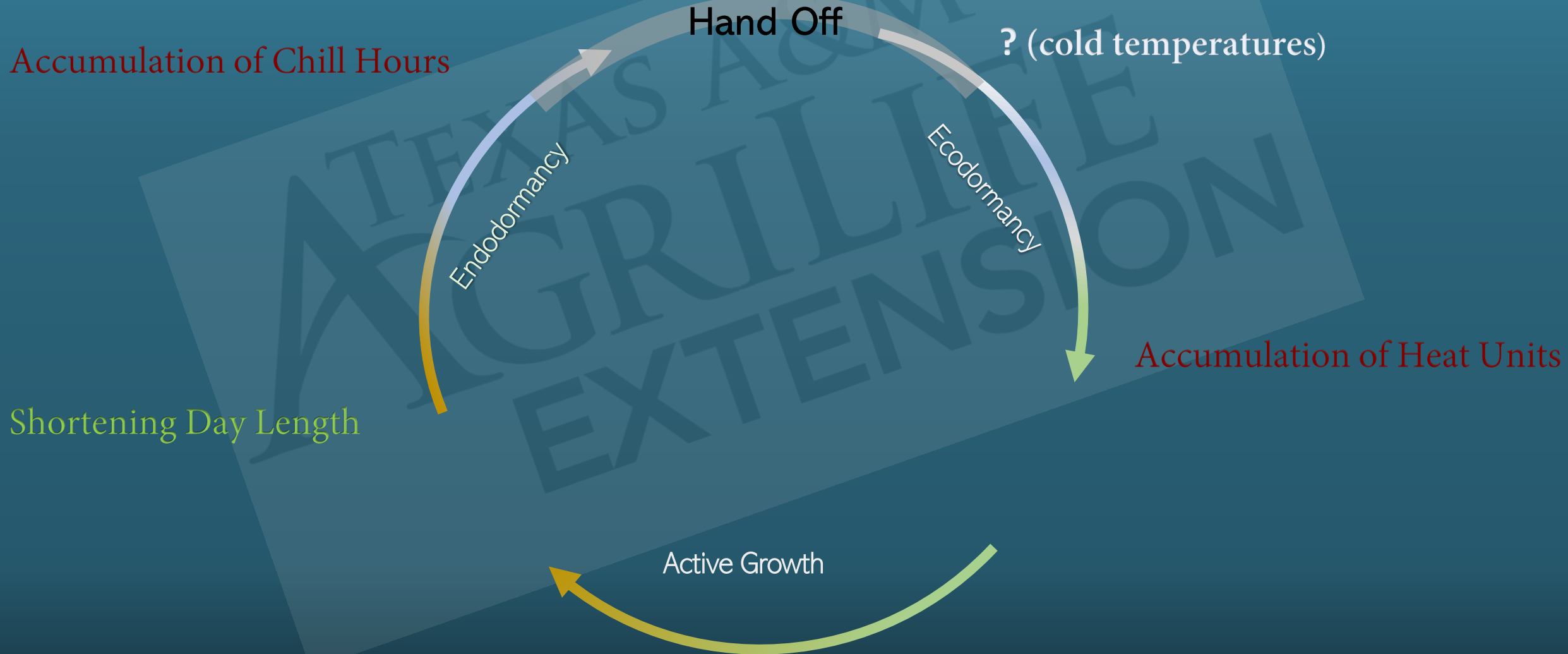
Released by Accumulation of Heat

Winter Dormancy in Grapes Occurs in Two Phases

I. ENDODORMANCY

II. ECODODORMANCY

Two Phases of Winter Dormancy

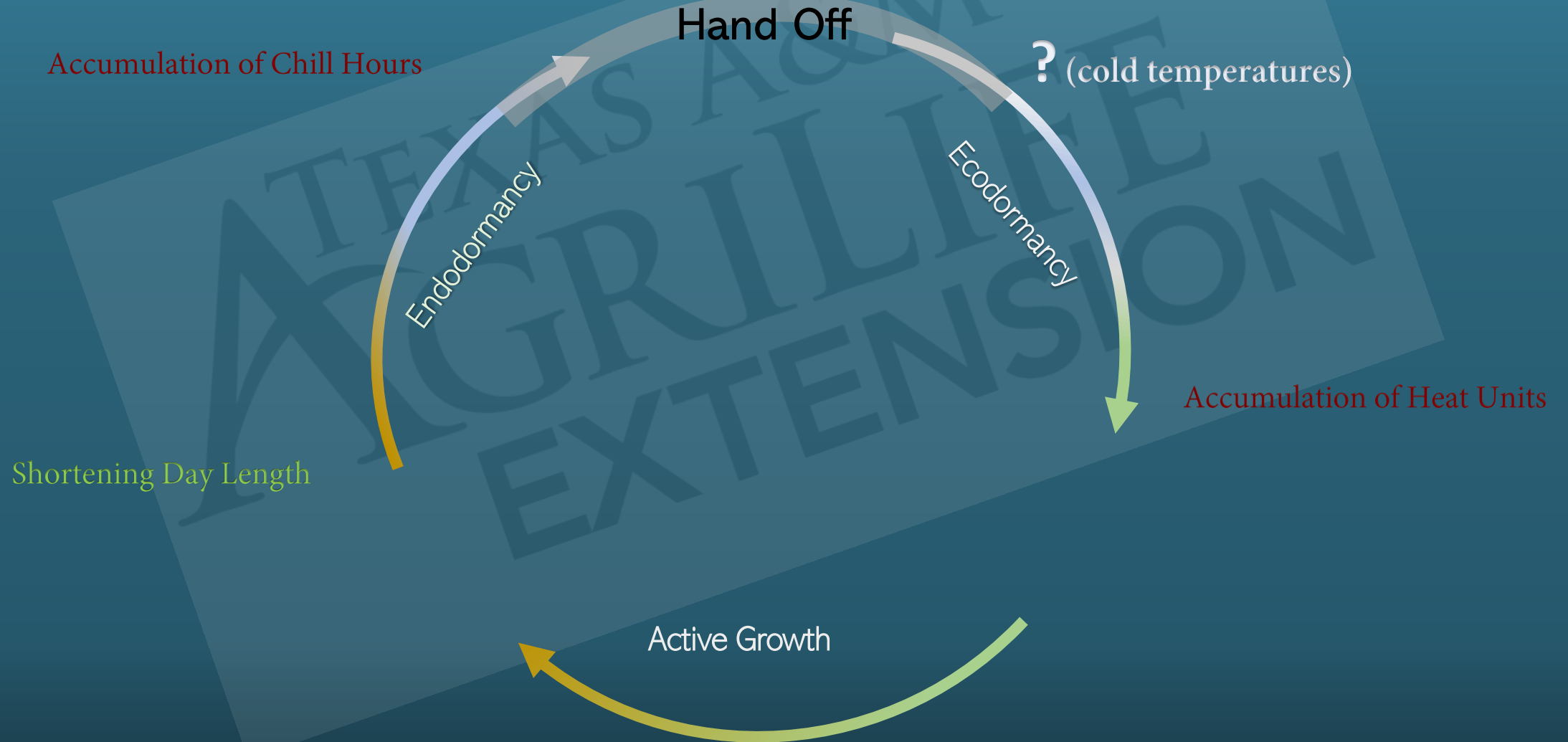


What is Dormancy

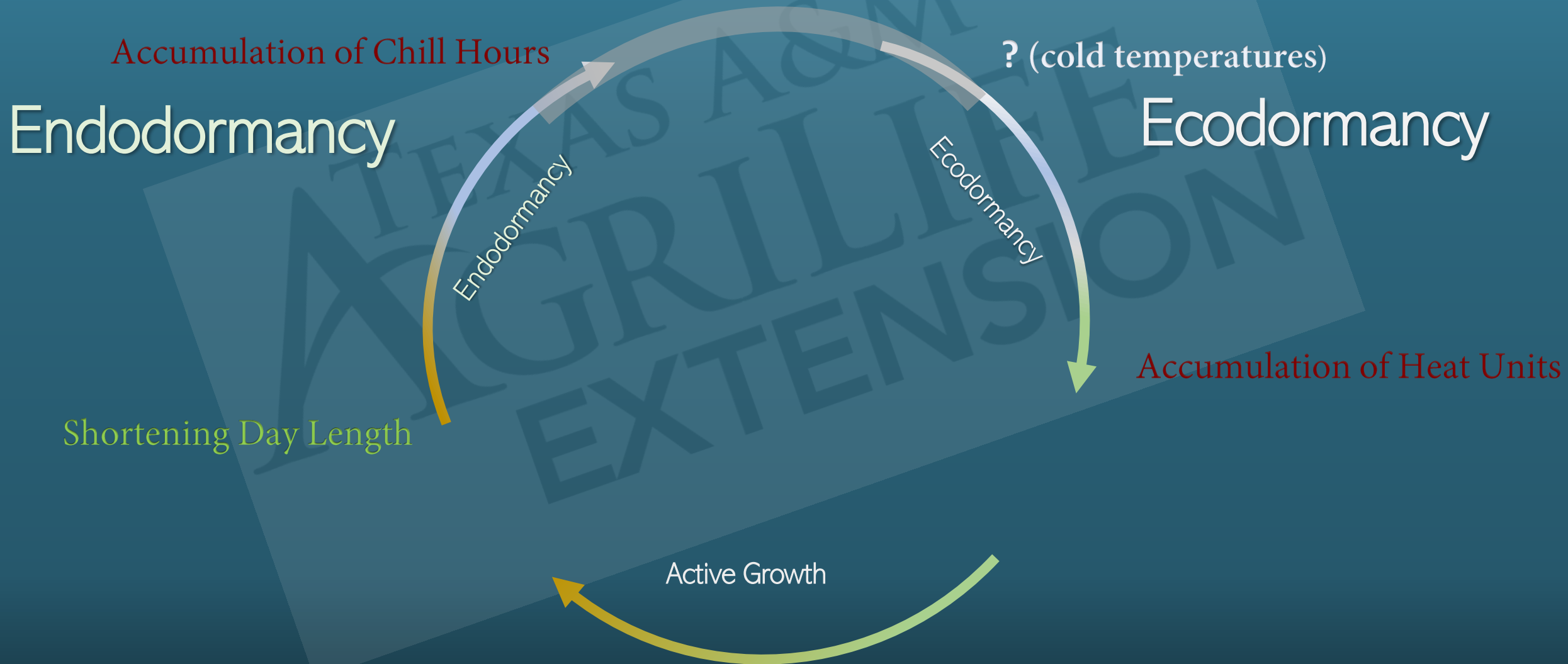
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Two Phases of Winter Dormancy



Two Phases of Winter Dormancy



Two Phases of Winter Dormancy

Endodormancy



Ecodormancy

Initiation- (day length dependent)

Day Length < 13 hrs.

~~Irrigation, Pruning, Harvesting, Fertilizing~~

Release –(chilling hour requirement is met)

Not well understood for most varieties of *V. vinifera*

~~Irrigation, Pruning, Harvesting, Fertilization~~

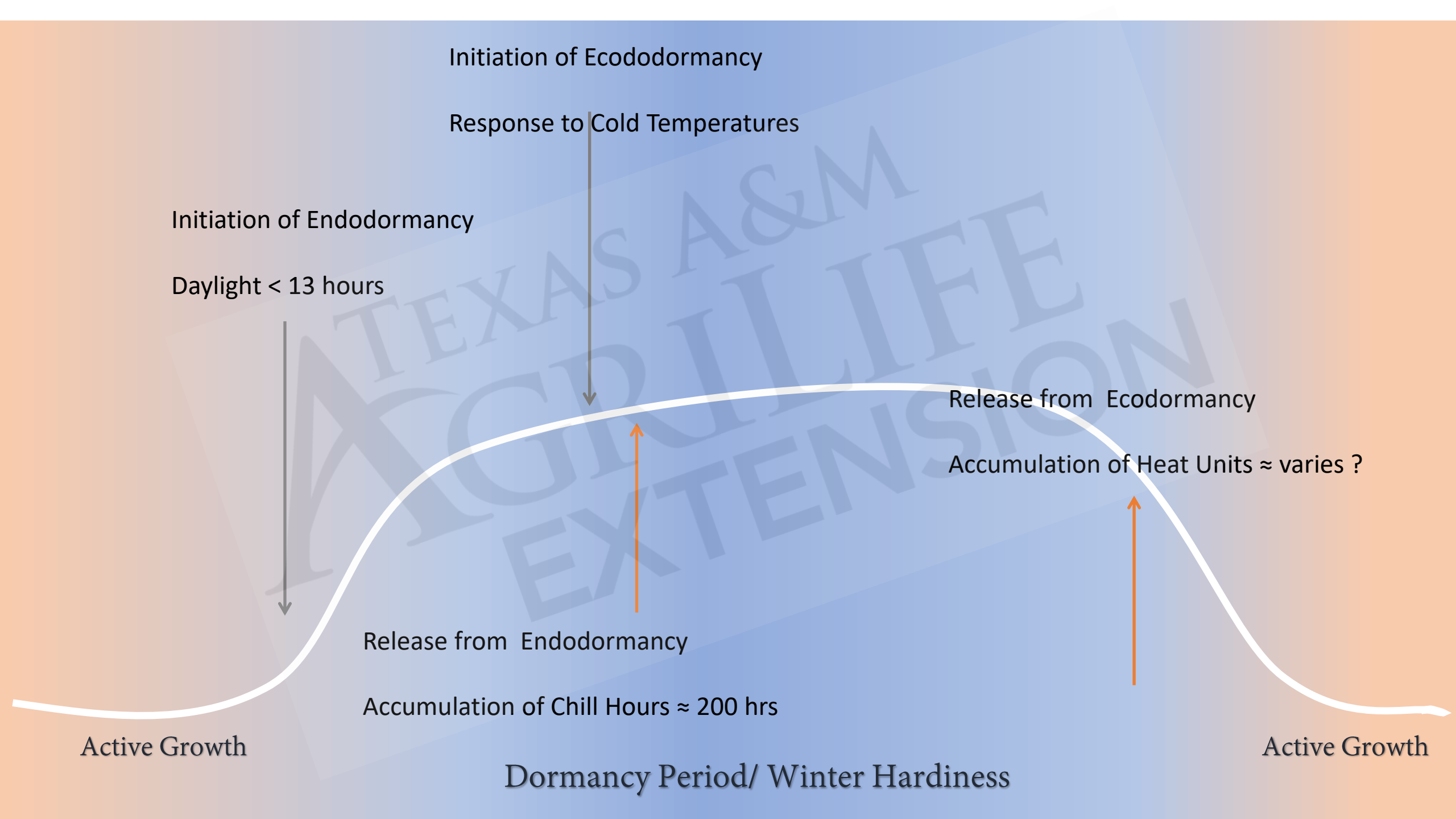
Initiation- (unfavorable conditions)

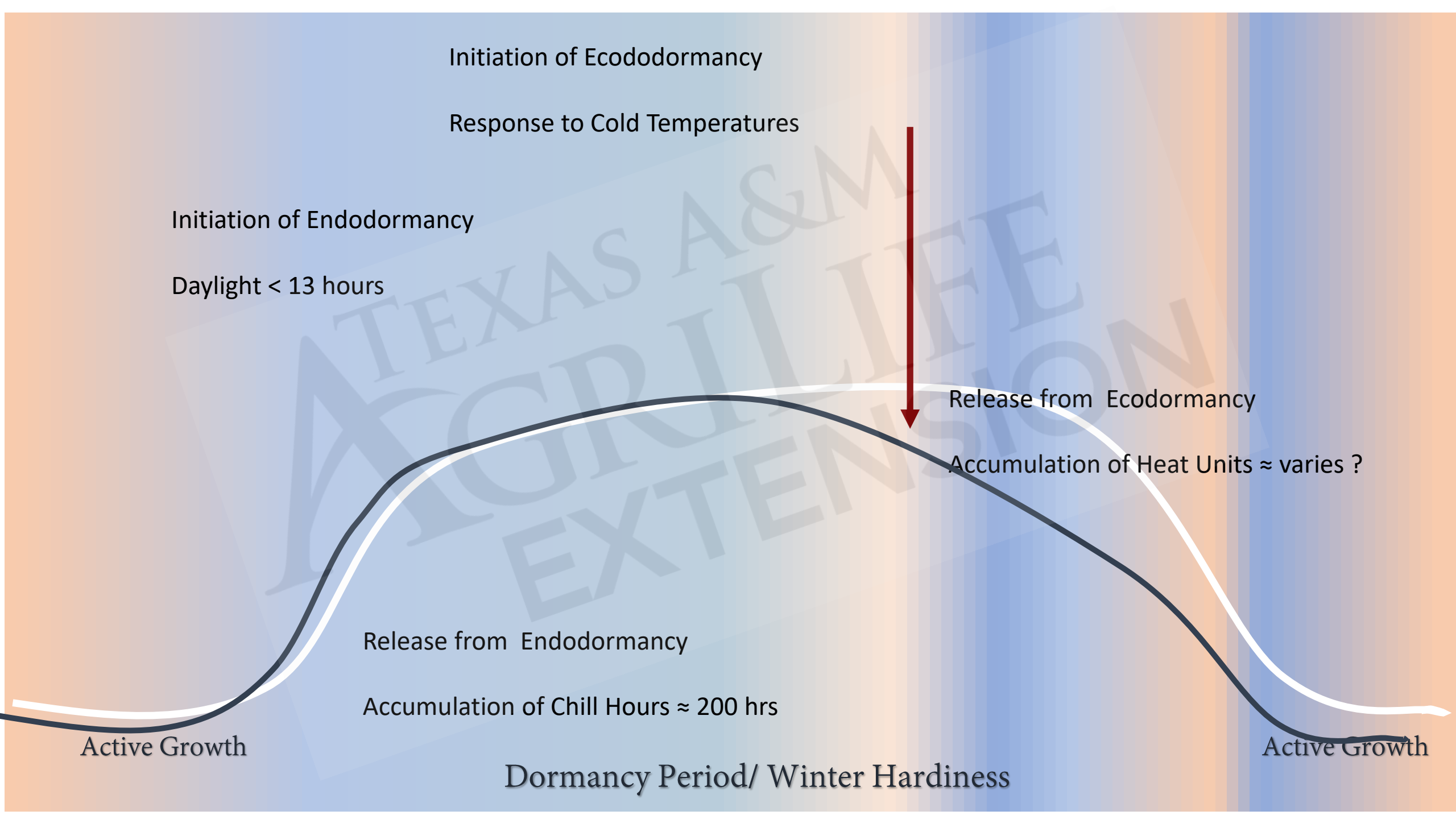
Cold Temperatures

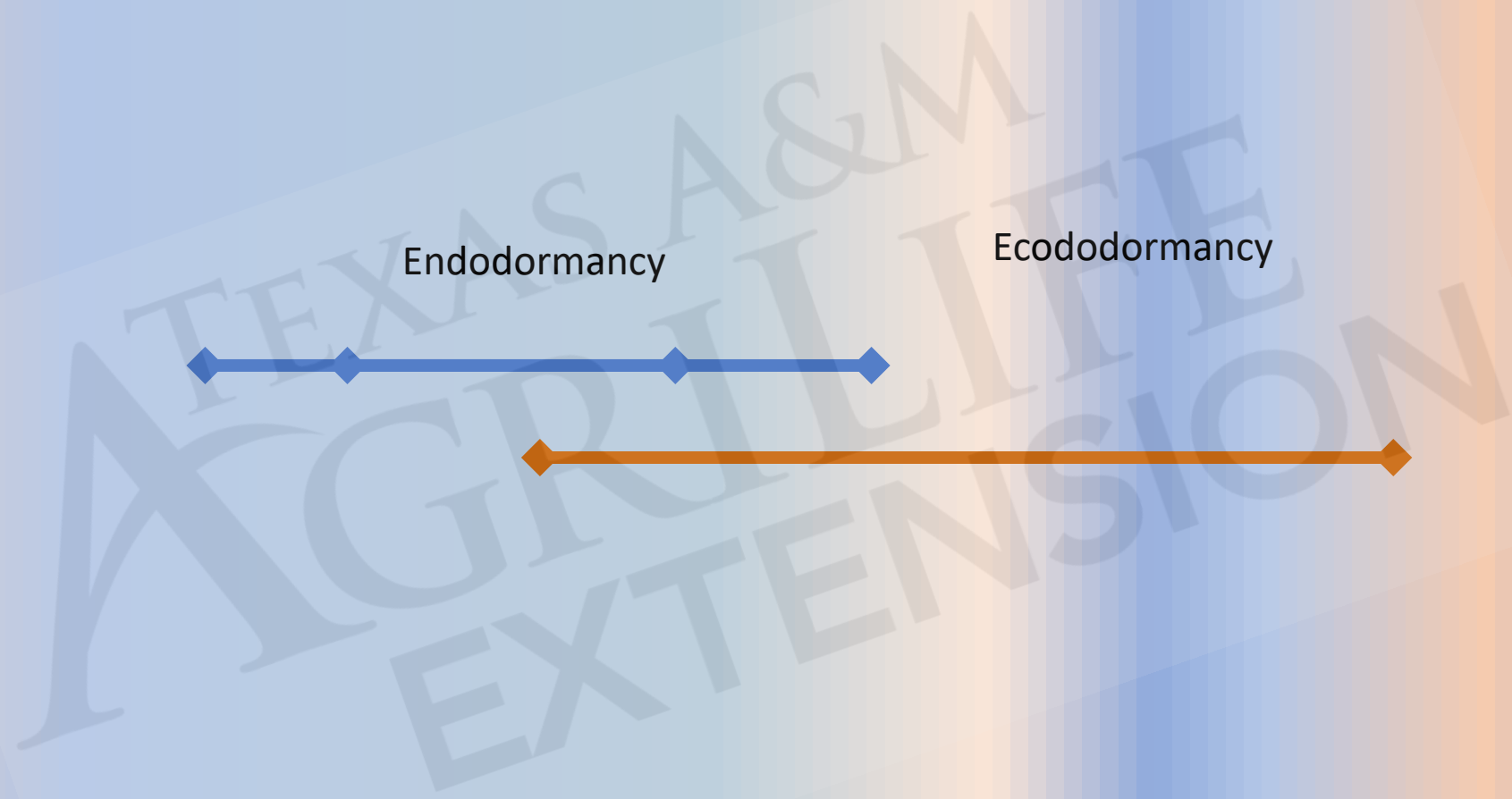
CONSEQUENTIAL

Release – (extended presence of conditions favorable to growth and survival)

Heat Unit Accumulation







Endodormancy

Ecododormancy



Active Growth

Active Growth

Dormancy Period/ Winter Hardiness

Dormancy Extending Practices

Remove Grow Tubes in Fall



Water deficit severity during berry development alters timing of dormancy transitions in wine grape cultivar Malbec

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Dormancy Extending Practices

Winter Cover Cropping



Water deficit severity during berry development alters timing of dormancy transitions in wine grape cultivar Malbec

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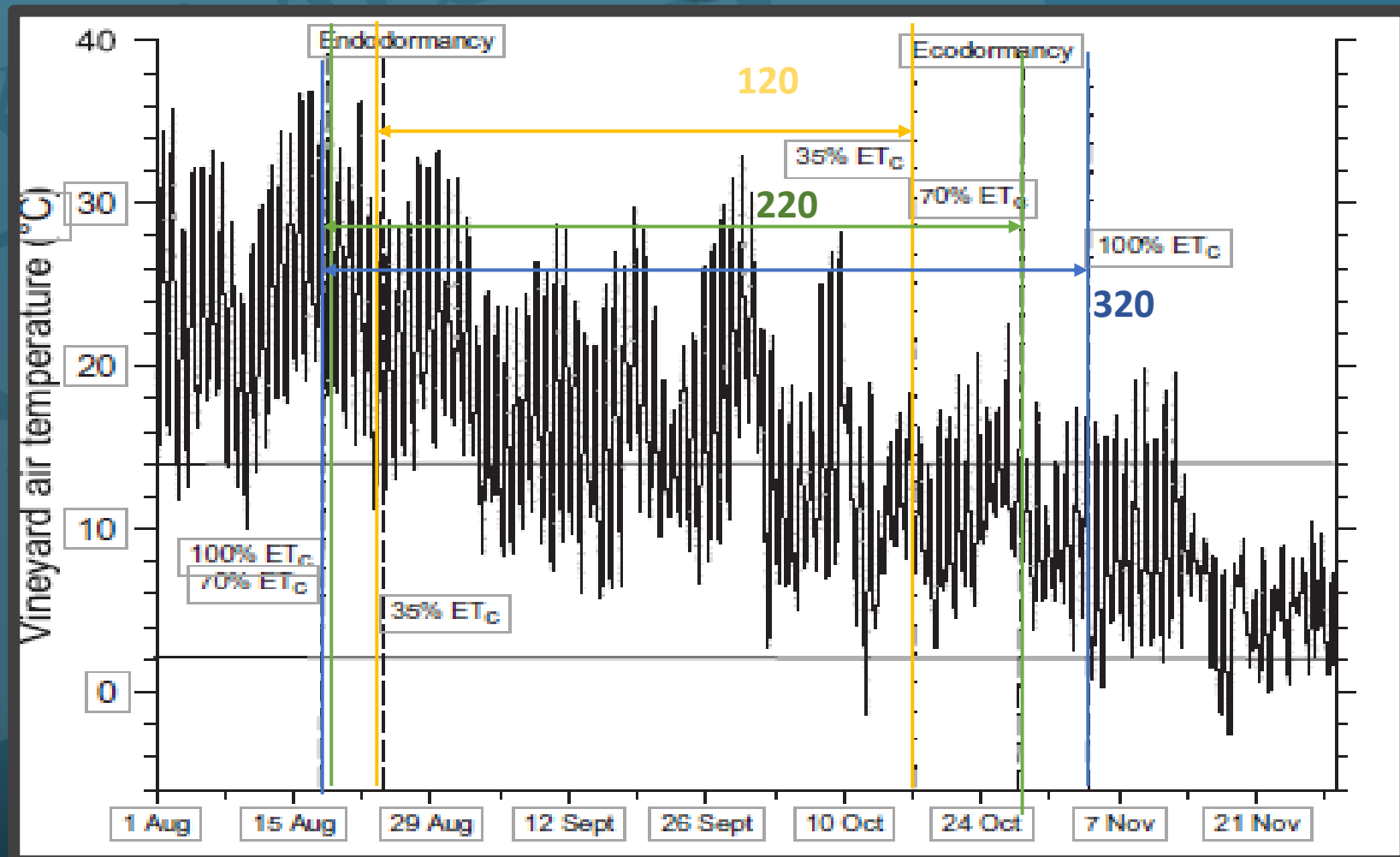
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Dormancy Extending Practices

Irrigation in the Growing Season



Water deficit severity during berry development alters timing of dormancy transitions in wine grape cultivar Malbec

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Dormancy / Hardiness Support Practices

Maintain Water Status Through Dormancy

Build Carbohydrate Bank



QUESTIONS

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