OSU EXTENSION SERVICE

Defining the Yield-Quality Paradigm for Pinot Noir

Dr. Patty Skinkis, Professor & Viticulture Extension Specialist

Oregon State University

March 21, 2024 – LIVE Annual Meeting

Questioning the Yield Quality Paradigm

82% conduct cluster thinning

67% target yield: 2 – 2.75 tons/acre

40 hours/acre manual labor

Statewide Crop Load Project

Objectives

1. Engage industry in the research process
2. Understand **yield**, **site characteristics**, and **climate effects** on vine health, fruit/wine quality
3. Develop yield management **guidelines** that balance quality and production goals
4. Determine the future of yield management with climate change

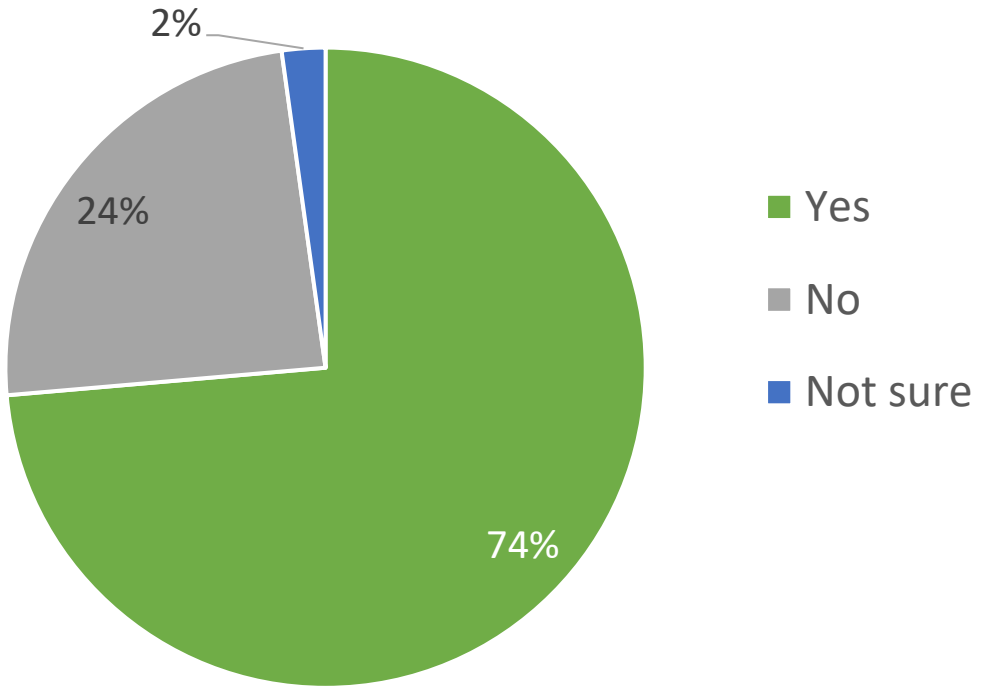
slido

Beginning survey

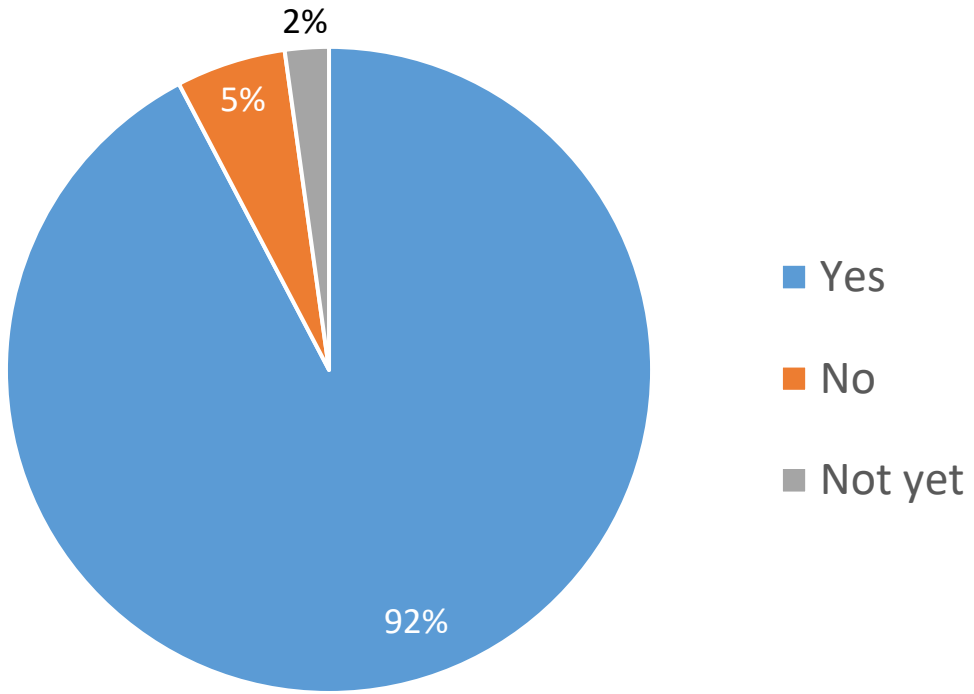
ⓘ Start presenting to display the poll results on this slide.

Audience Poll Results

Have you heard of the Statewdie Crop Load Project?



Do you produce Pinot noir?



Audience Poll Results

Which cultivars do you focus yield targets (i.e., cluster thin more)?

Industry Participation (2012-2021)

Adelsheim
Airlie Winery
Archery Summit
A to Z Wineworks
Atlas Vineyard Mgmt
Björnson Vineyard
Bethel Heights Vineyard
Chehalem Wines
Cristom
Dion Vineyard
Domaine Drouhin of Oregon
Domaine Serene
Duck Pond
Forest Hills Farms
Jackson Family Wines
Johan Vineyards
Ken Wright Cellars
Lemelson Vineyards
Results Partners
Stoller
Van Duzer Vineyards
Willakenzie Estate
Winemakers Investment Properties/Precept Wine
Winter's Hill Winery

Total Participation

25 companies

28 vineyards

5 Counties

6 AVAs

Annually:

10-15 vineyards

Industry Participation

Company Classification		Vineyard Size (acres)		Winery Size (cases)	
Vineyard Only	18%	Small (< 100)	39%	Small (< 10,000)	20%
Estate vineyard and winery	54%	Medium (100-300)	42%	Medium (10,000 - 29,999)	50%
Vineyard and winery	28%	Large (>300)	19%	Large (30,000-100,000)	15%
				Very Large (>100,000)	15%

Experimental Design

Company selected cluster thinning treatments

0.5, 1, 1.5, and 2 clusters/shoot or Full Crop

Randomized complete block design

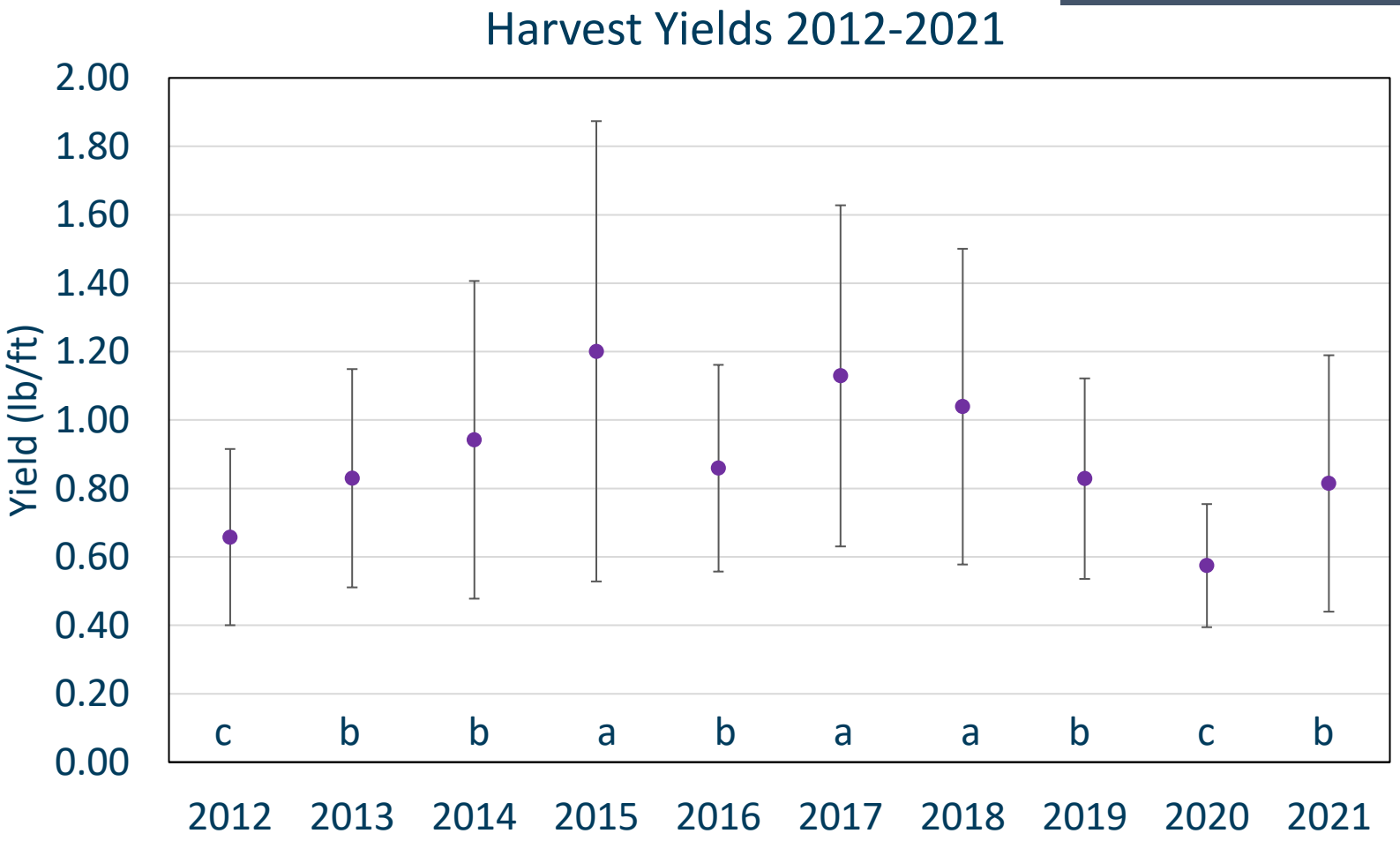
Three field replicates sampled

Treatment	% clusters removed	Clusters count/ft
0.5 clusters/shoot	64	2
1 cluster/shoot	42	3
1.5 clusters/shoot	22	4
2 clusters/shoot	8	5
Full Crop	0	5

Harvest Yields – *by Year*

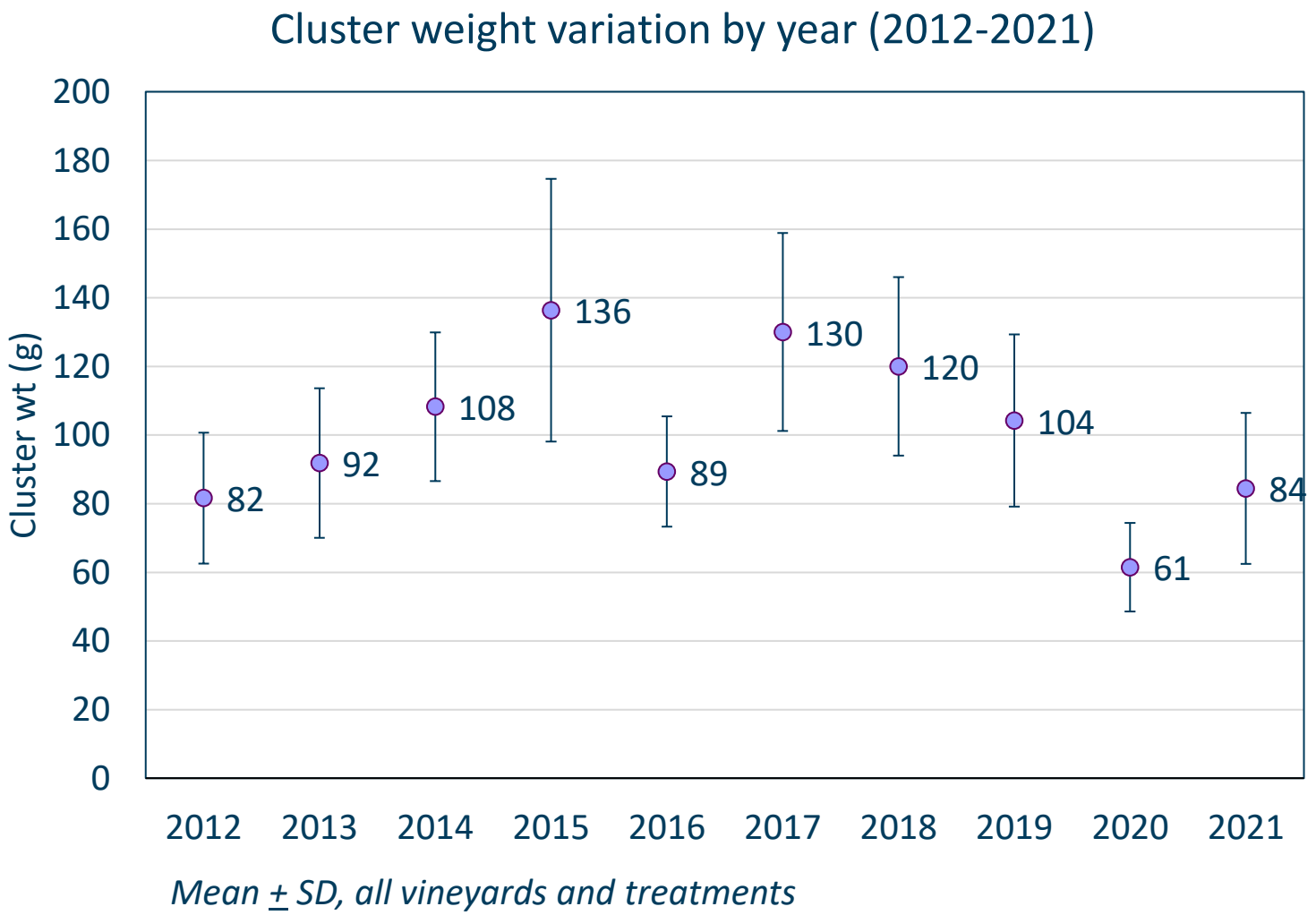
10-year mean:
0.94 lb/ft
1.5 kg/m

Photo by Dana Estensen



Mean ± SD, all vineyards and treatments

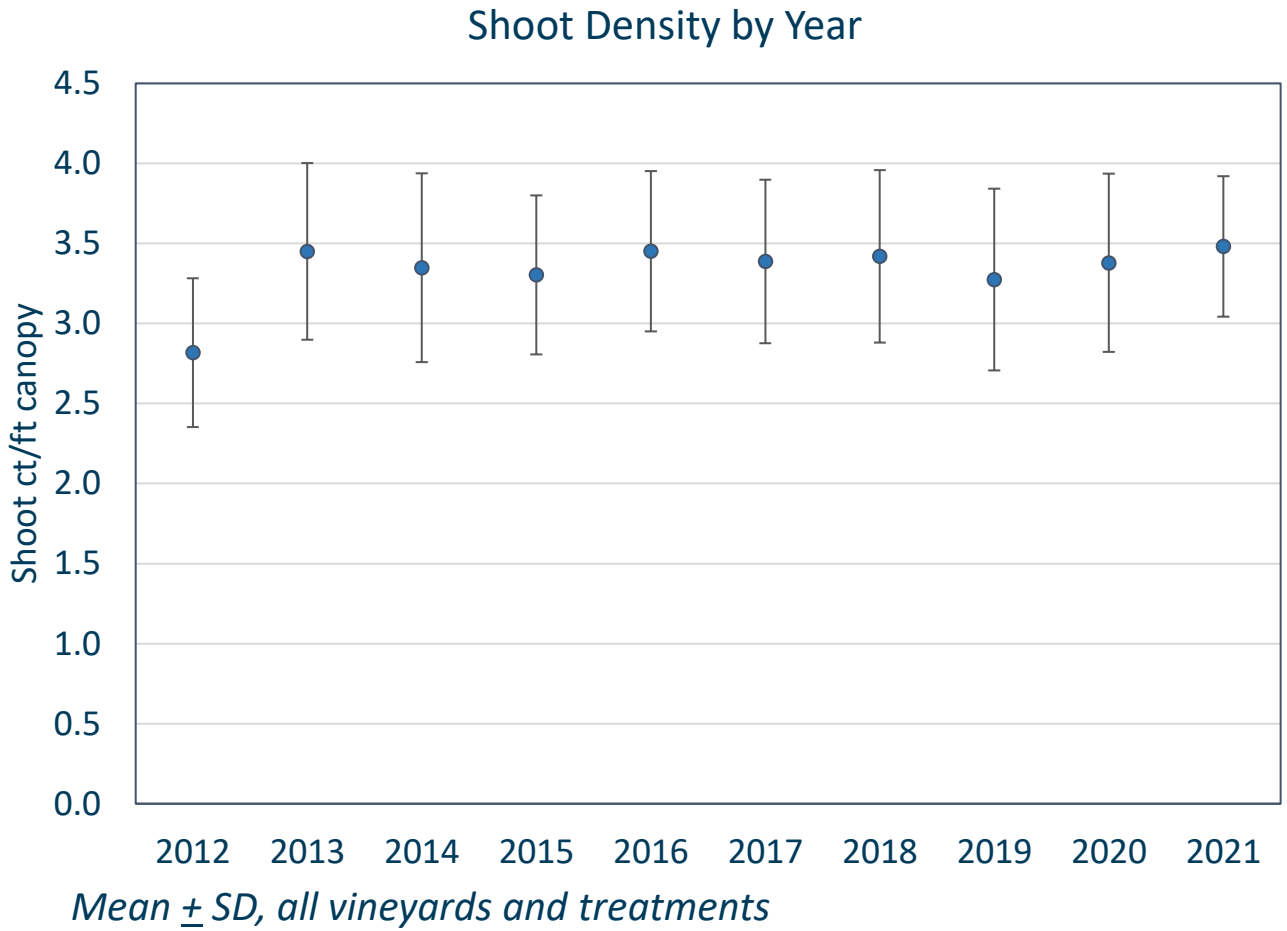
Yield Impacts – *Cluster weight*



Mean ± SD, all vineyards and treatments

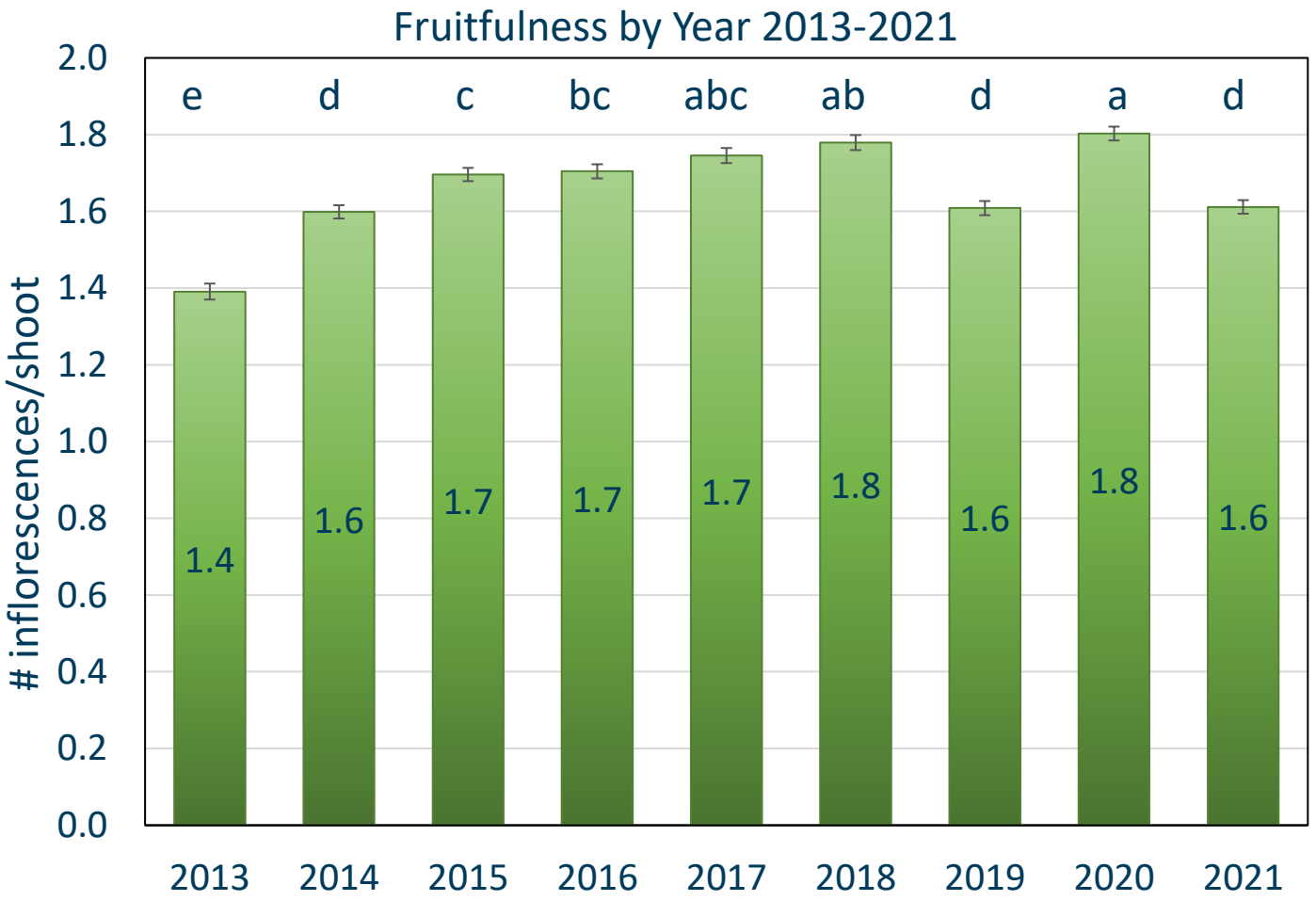
Yield Components – *Shoot density*

All vineyards were cane pruned and shoot thinned to same density per linear ft of canopy



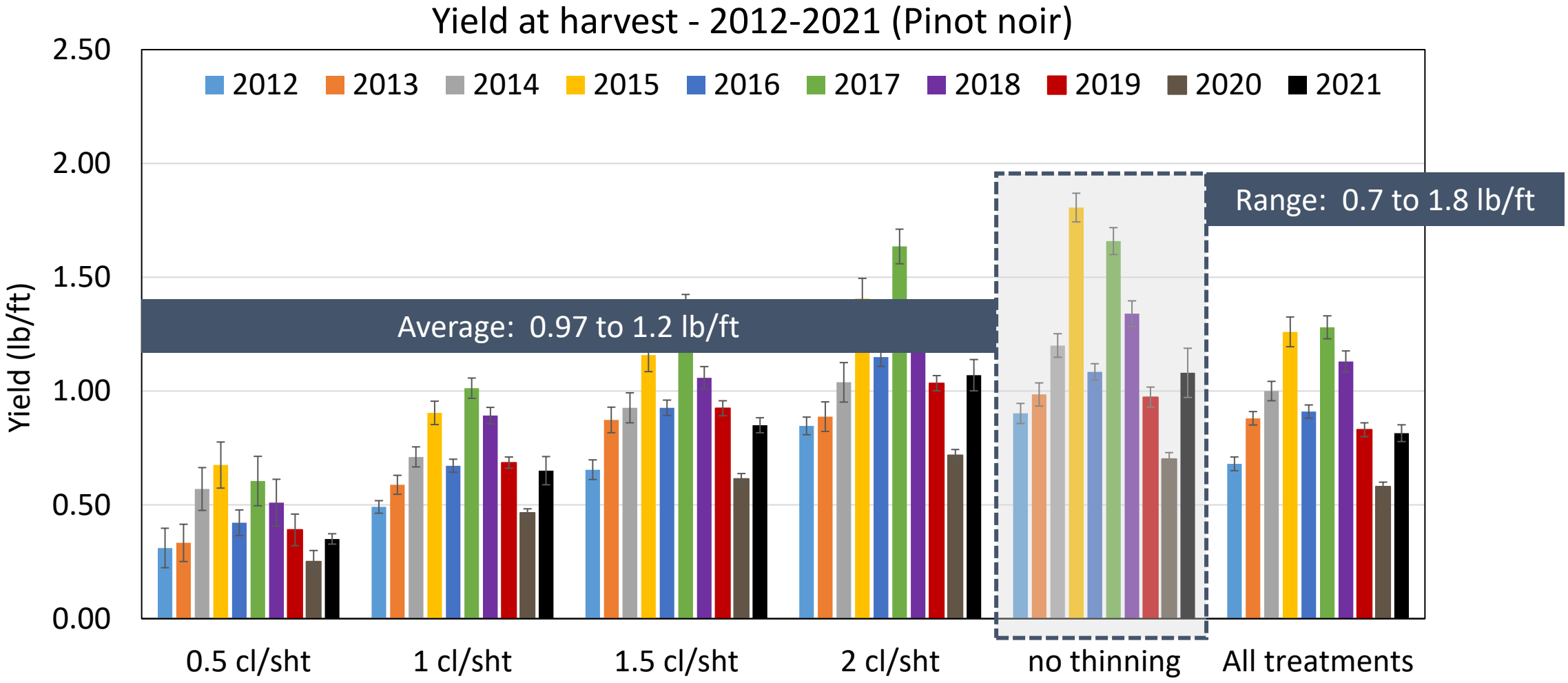
Mean ± SD, all vineyards and treatments

Yield Components - *Fruitfulness*



Mean ± SD, all vineyards and treatments

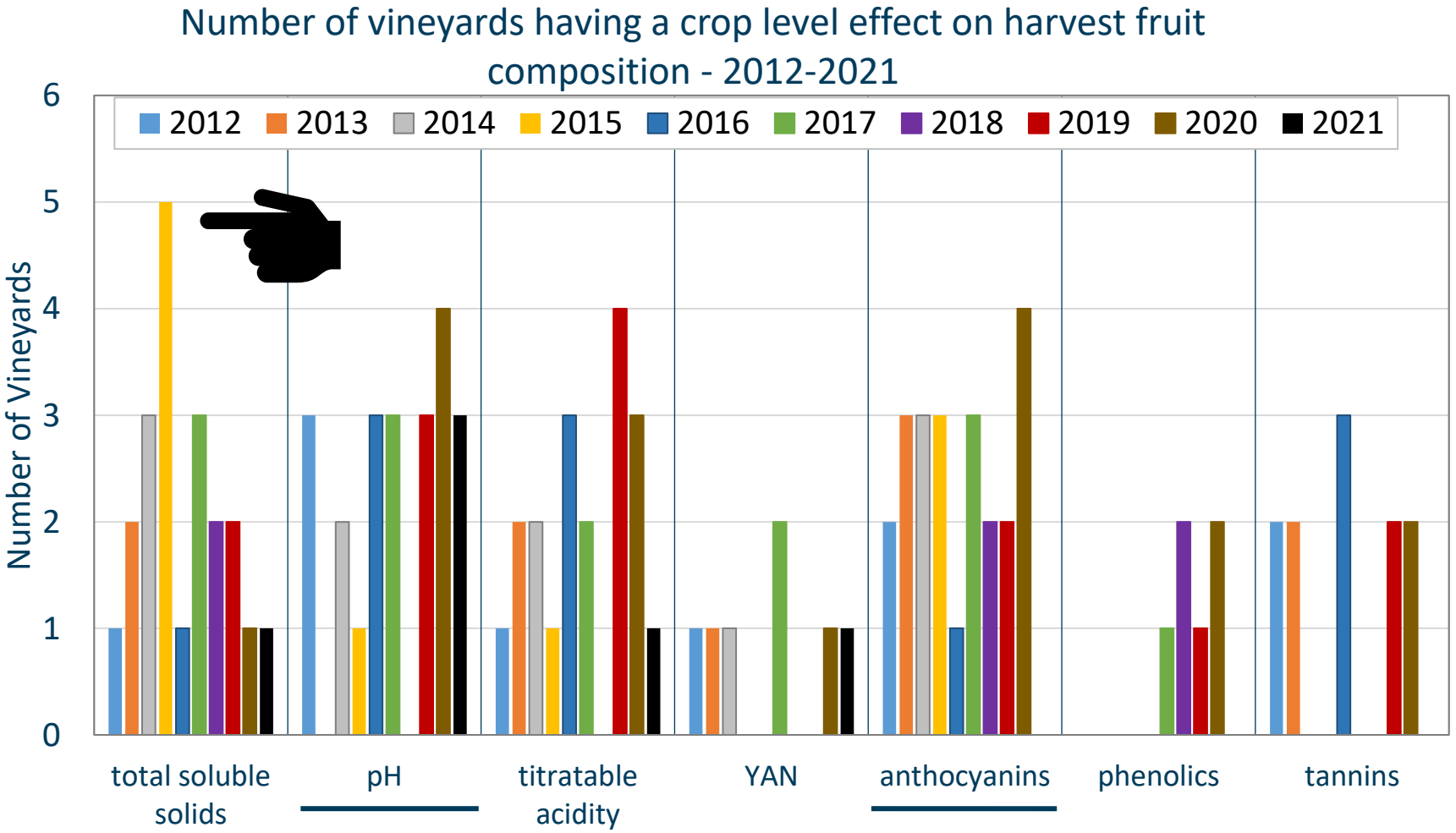
Harvest Yield – *Treatment x Year*



Cluster thinning will hasten berry ripening and improve fruit and wine concentration.

Oregon State University
Extension Service

Results – *Fruit Composition All Years, All Sites*



10-15 sites/year

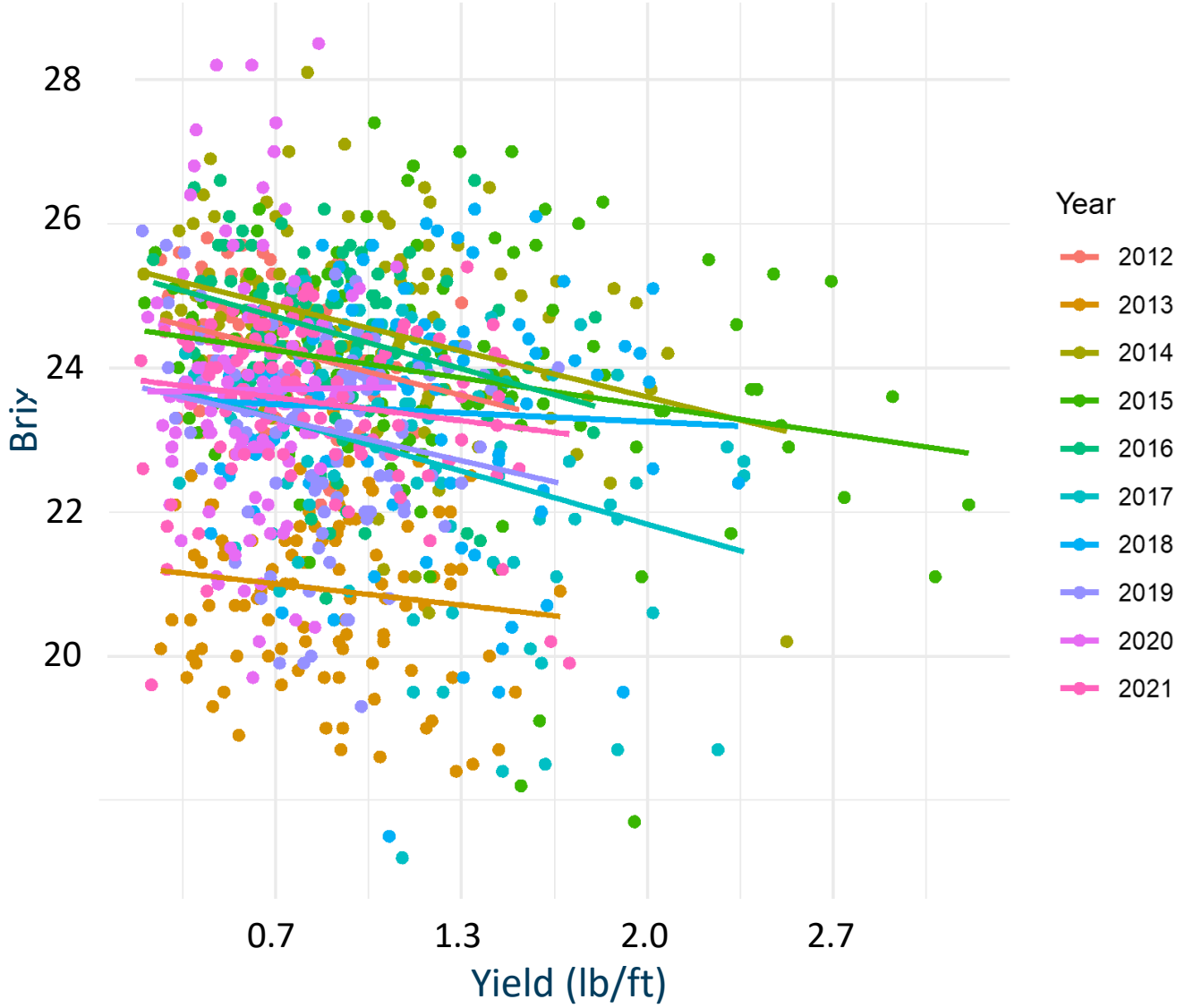
42-85% some effect

15-58% no effect

6-25% primary ripeness

No consistent differences by crop level!

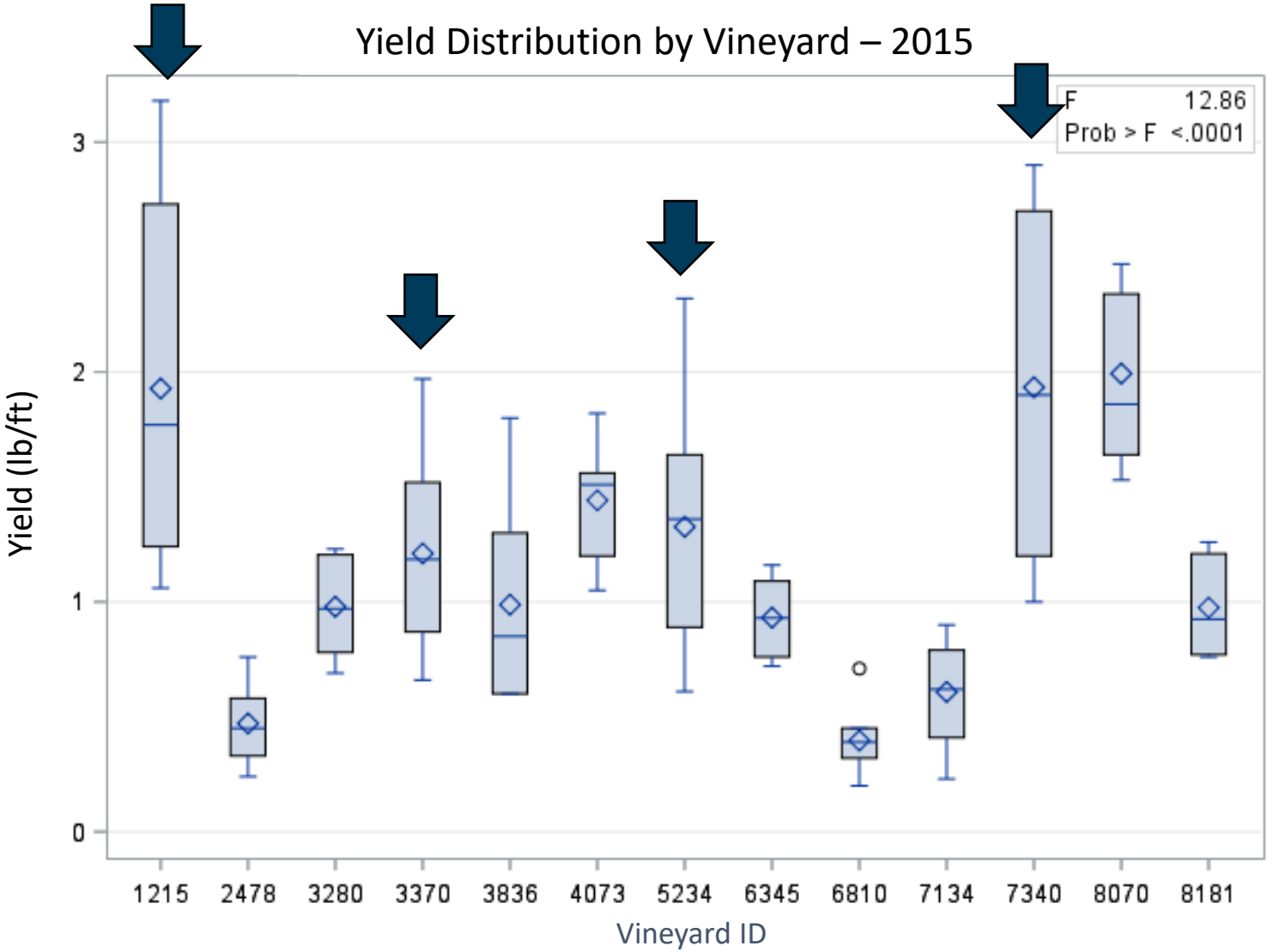
Results - *All Vineyards, All Years*



For every 0.7 lb/ft of cluster thinning, there is an expected increase in TSS by 0.21°Brix

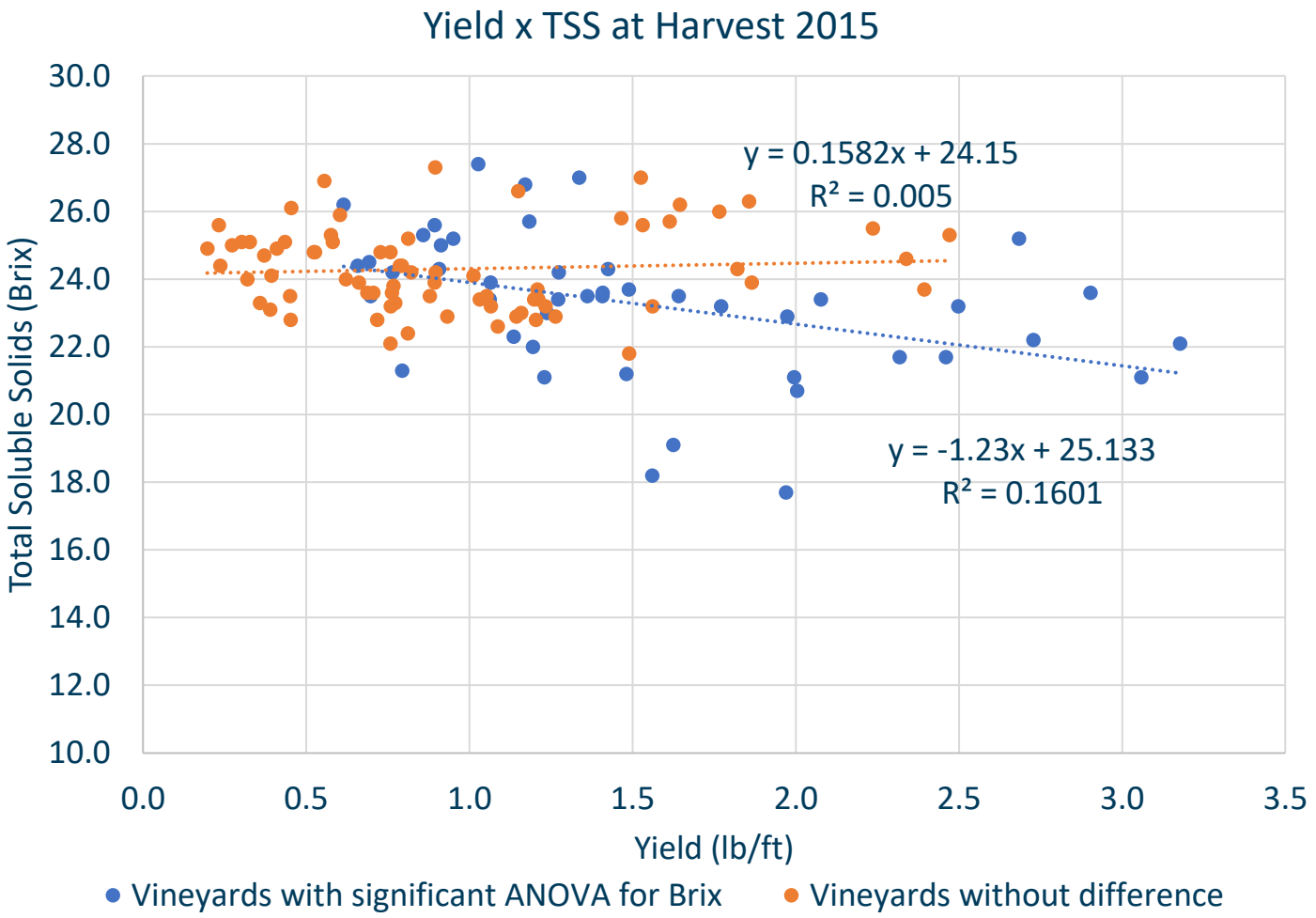
Most thinning reduces crop level by < 0.7 lb/ft!

What we can learn from high yield years…



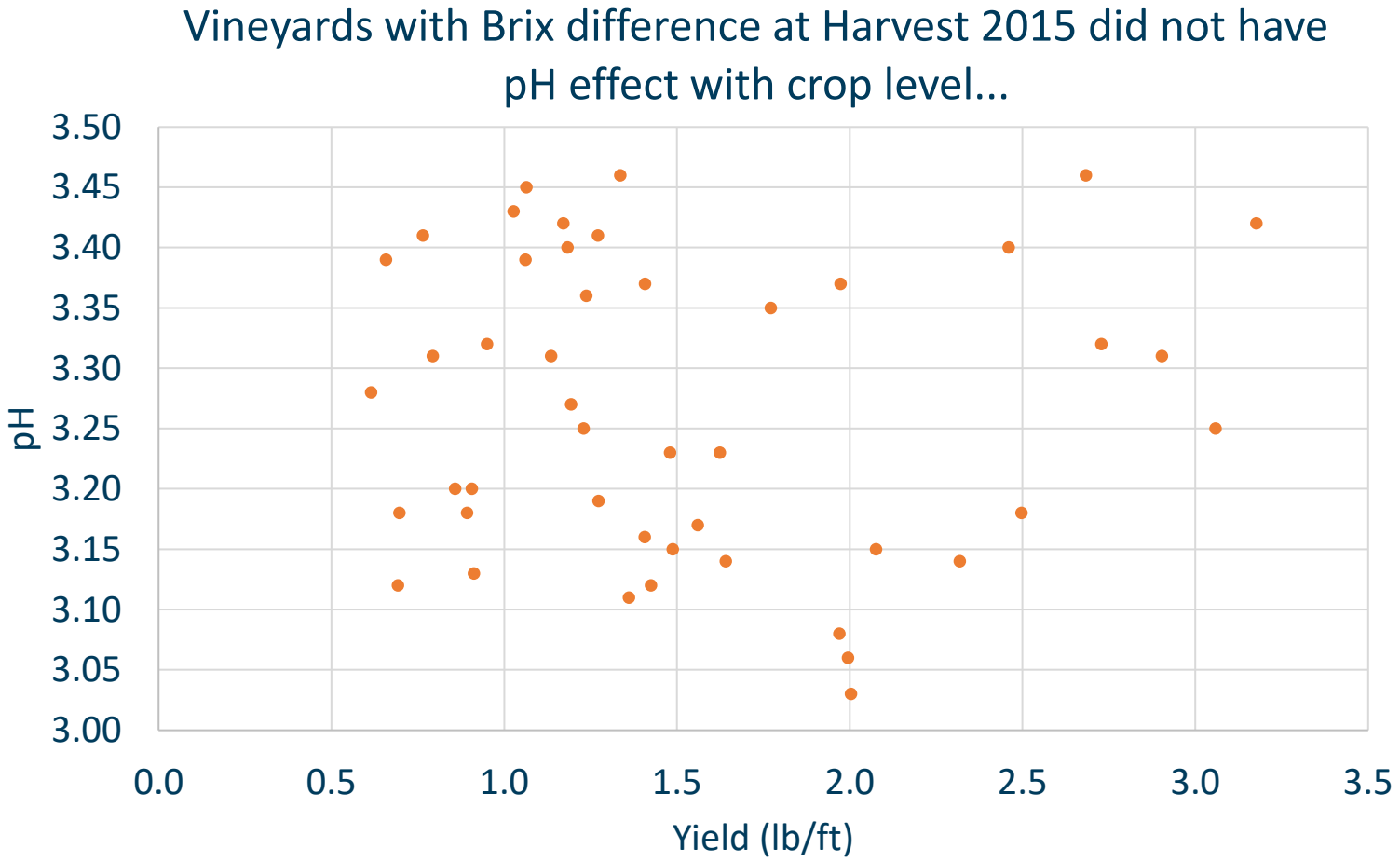
- 13 Pinot noir vineyards
- 4 had cluster thinning impacts on TSS
  - Higher yields and/or greater variance in yields across treatments

Impact of Cluster Thinning - *4 of 13 Vineyards (2015)*



All 4-Vineyard Model	
lb/ft	TSS
0.75	23.9
0.80	23.9
0.90	23.9
1.0	23.9
1.1	23.8
1.2	23.7
1.3	23.5
1.4	23.4
1.5	23.3
1.6	23.2
1.7	23.0
1.8	22.9
1.9	22.8
2.0	22.7

Impact of Cluster Thinning - *pH*



No yield – pH relationship

Case where thinning is needed – *high density*

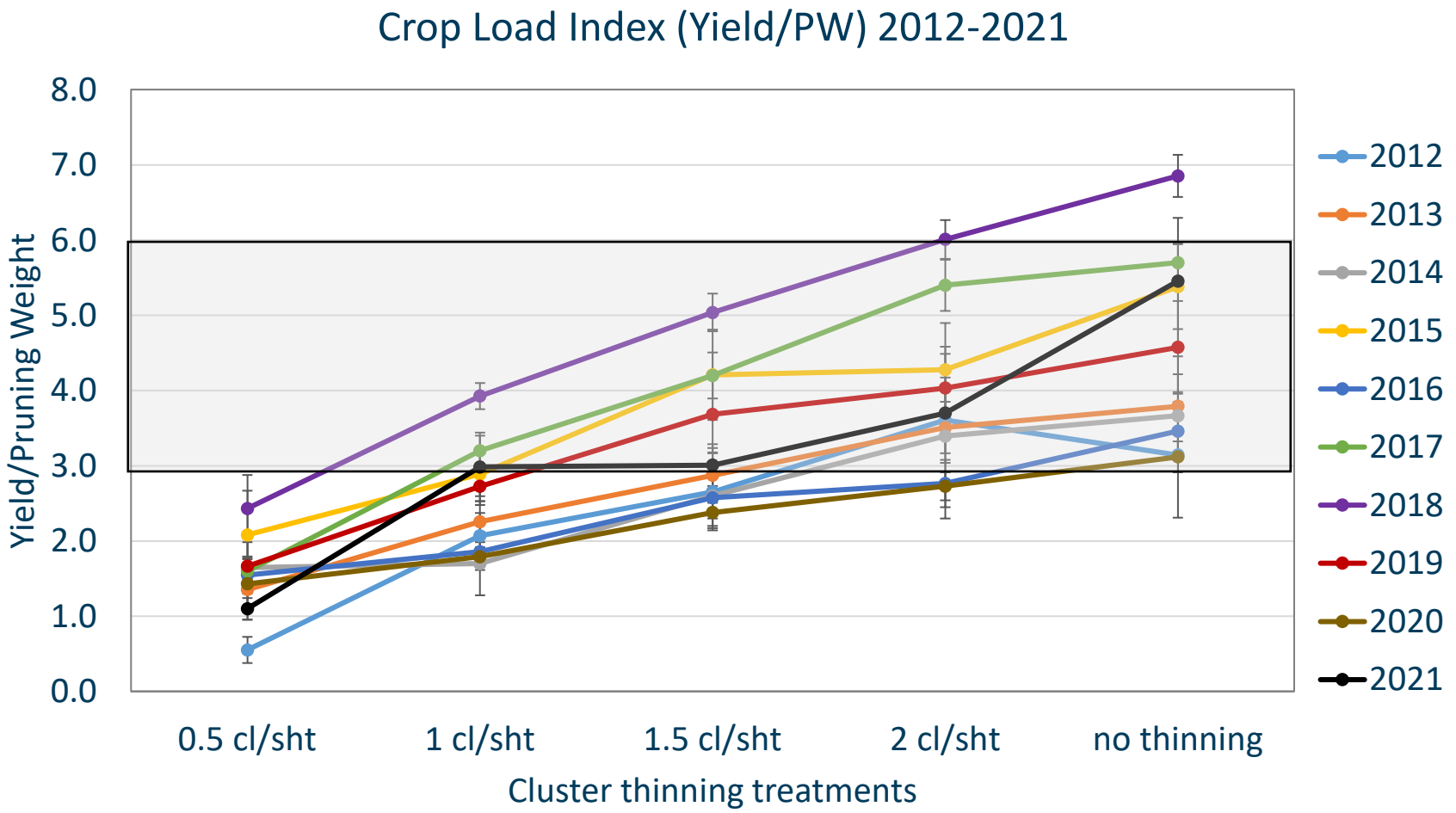
Why so few differences?

- Shoot density fixed by cane pruning and shoot thinning practices
- Shoot and cluster density is low = low yield range for trial
- Vines were not over-cropped in most years
- Adequate heat units and season length for ripening

Over-cropping will stress vines and reduce vine growth requiring more inputs.

Oregon State University
Extension Service

Results – *Vine balance*



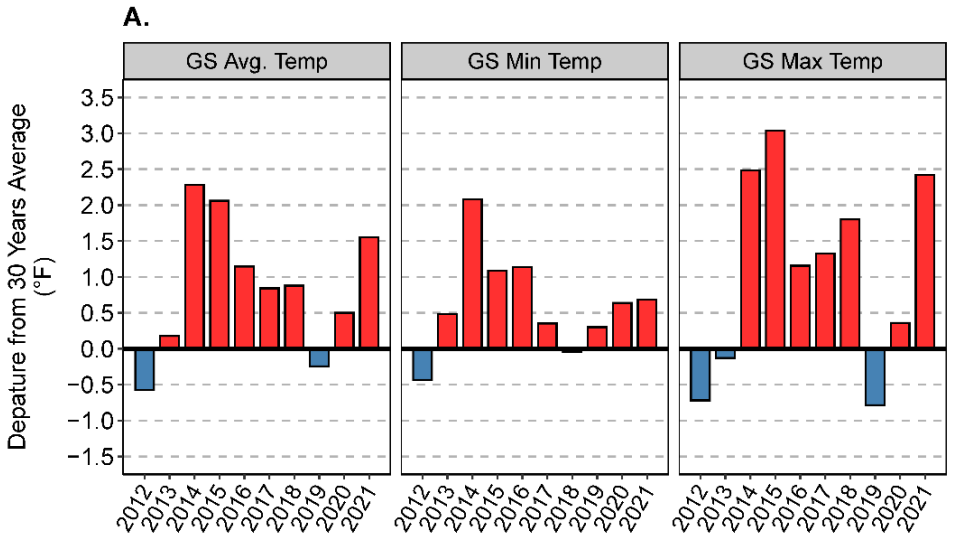
Results – *Vine Size/Vigor*

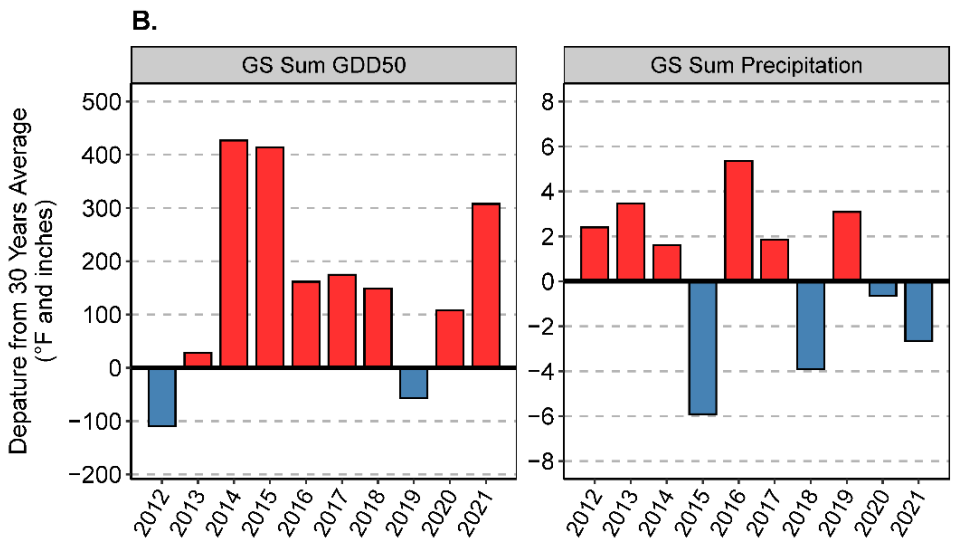
No differences in veraison nutrient status

No differences in dormant pruning weights

Seasonal conditions 2012-2021

- Compared to 30-year average:
  - <0.5 to 3.0°F warmer
  - >400 GDD_{50} warmer in 2014 and 2015
  - Less than average rainfall 4 of 10 years

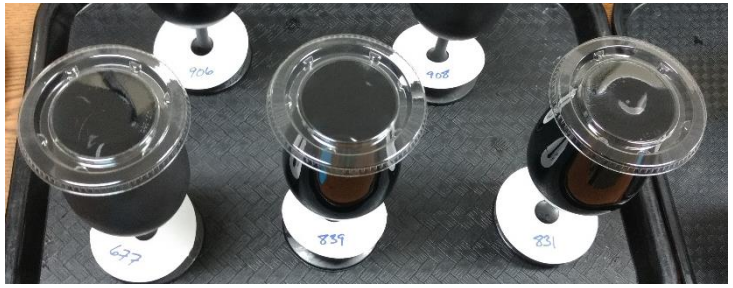




How was wine quality impacted?

Oregon State University
Extension Service

Wine Sensory Results



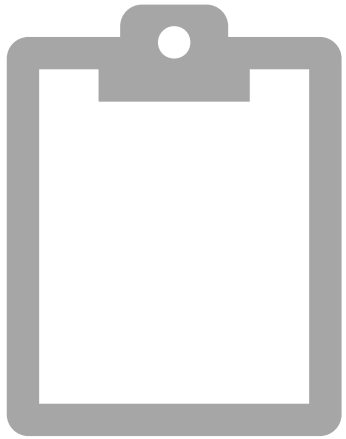
OSU Winemaker Panel

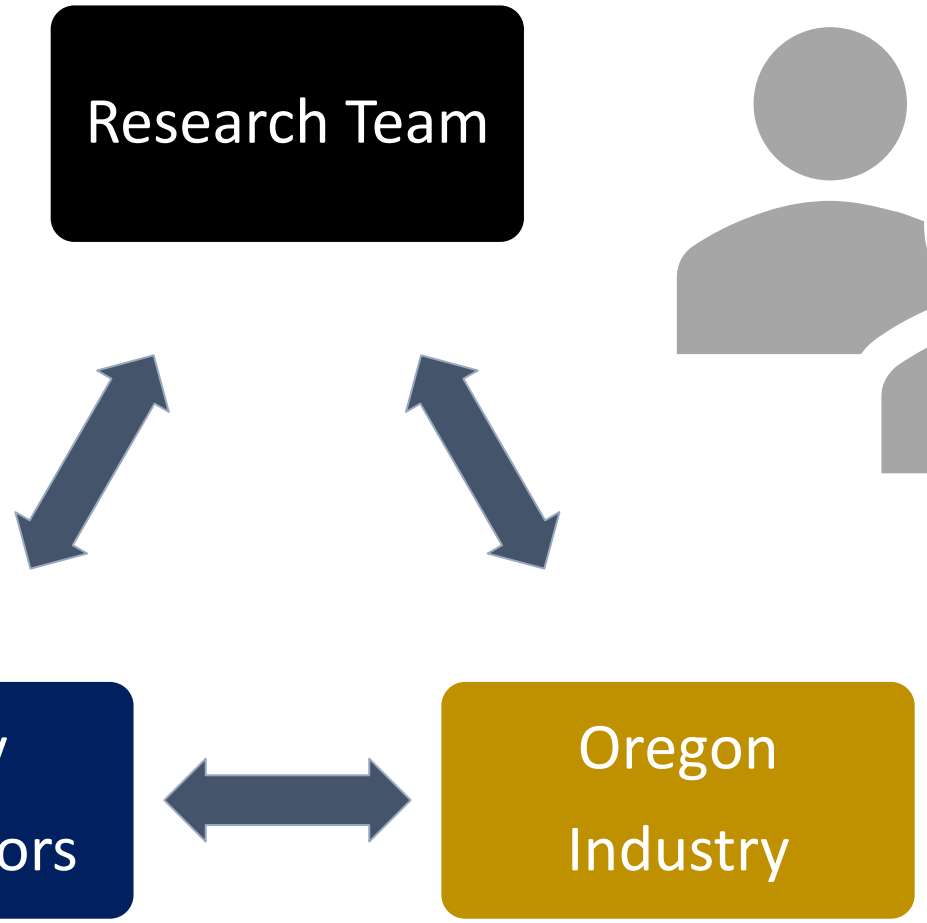
In-house Sensory

Industry Technical Tasting

Determining Impact & Adoption

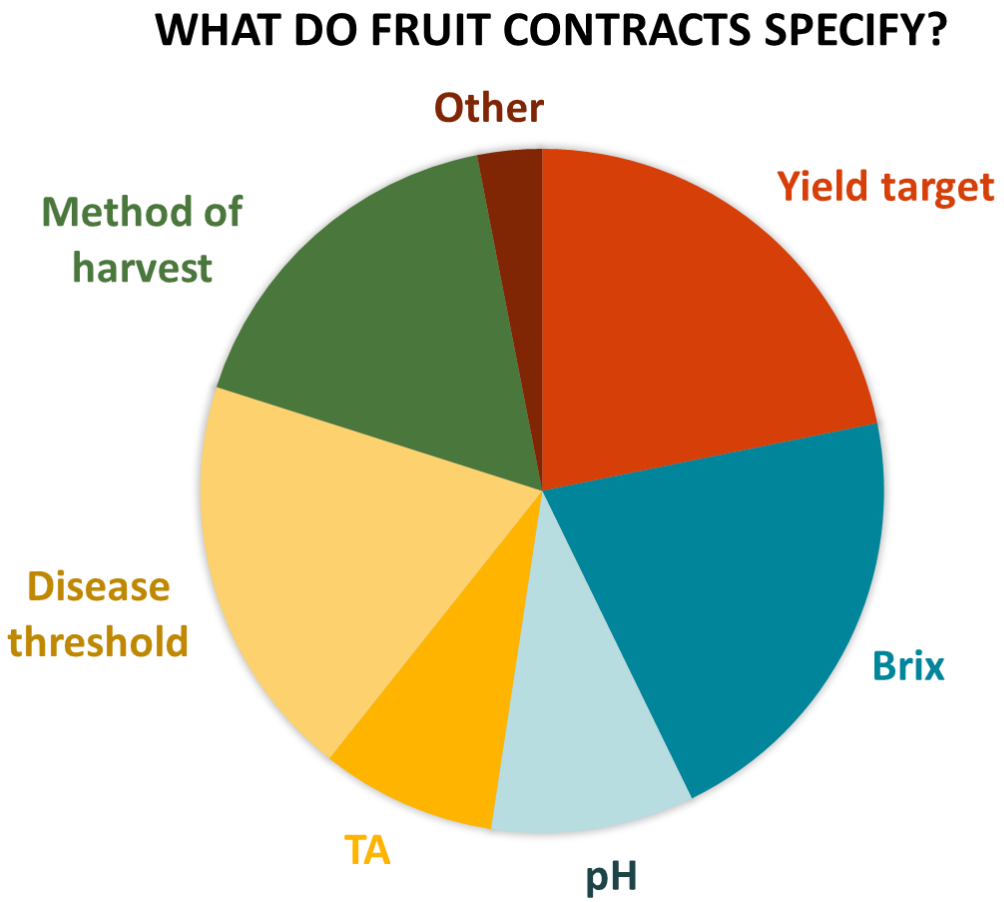
Are we transforming yield management practices?



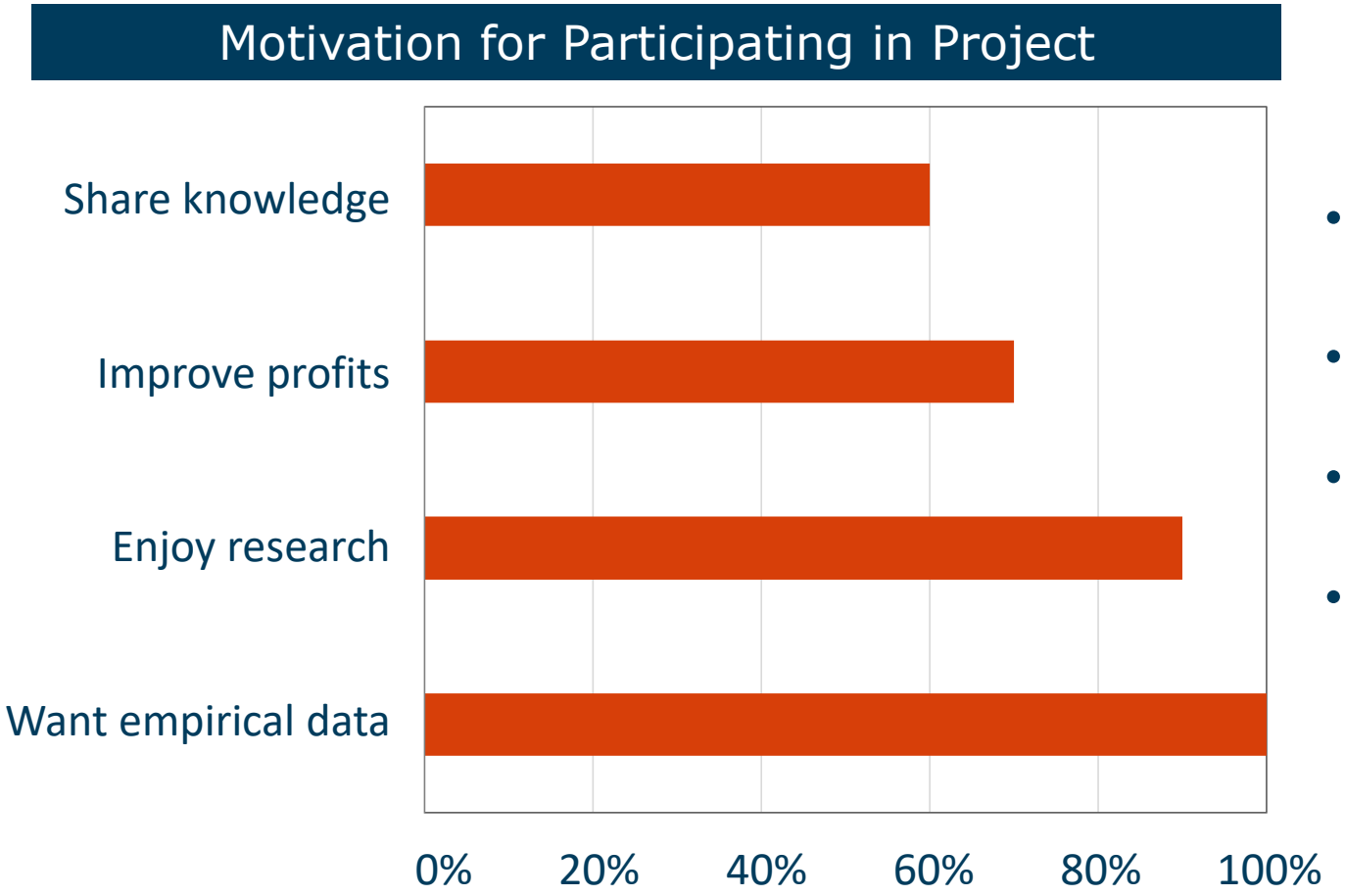


Results – *Industry Survey 2018*

- Crop thinning practiced by 90%
  - Yield targets increased
- 65% ↑ yields over last 5-8 years
  - Yields ↑ by 0.5 – 1.0 T/A or 10-40%
- Freedom to negotiate yield targets
- Increased knowledge to quantify vine balance
- More contracts compared to 2012

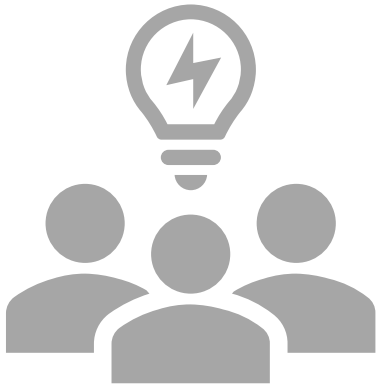


Results – *Collaborators 2018*



- 40% ↑ yields by 0.25-2.5 T/A
- 80% confident with higher yields
- 96% evaluated wines in-house
- 41% found little to no sensory difference between crop levels

Focus Group Meetings 2024



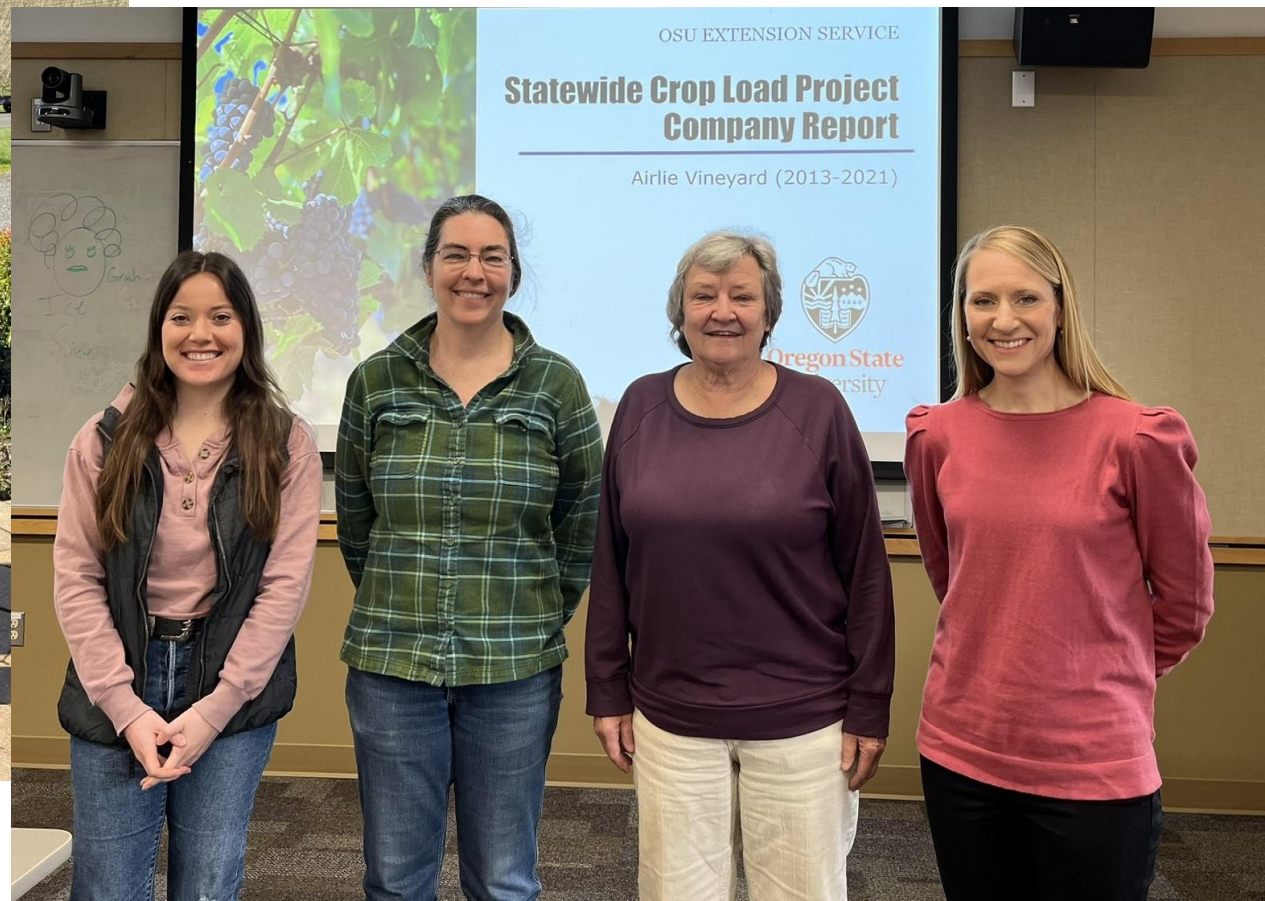
1. What changes have you made?
2. Which changes made the most impact financially?
3. Are there current/future potential economic impacts to be experienced because of this study?
4. How important is yield management in contributing to fruit and wine quality?

2024 Company Meetings

2024 Company Meetings

2024 Company Meetings

2024 Company Meetings



Focus Group Results

- 100% confidence in higher yields
- Adopted increases in all wine production tiers
- Manage to seasonal conditions and site vs. prescribed yield
- Realized increased revenue and efficiency – increased profits, labor savings
- Using “smarter” yield metrics (lb/ft)
- Impact beyond individual company

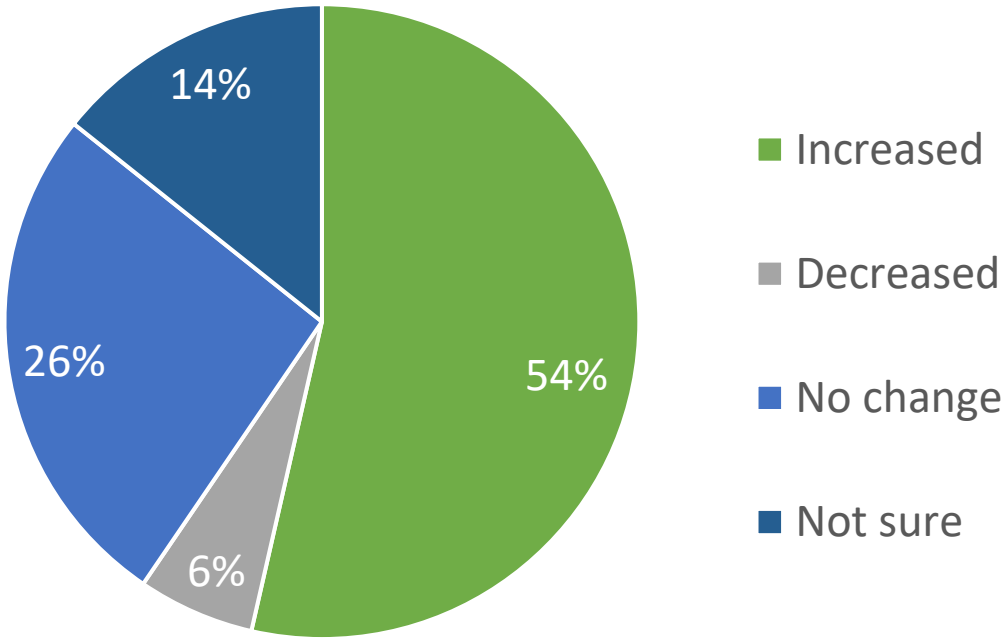
slido

End Survey

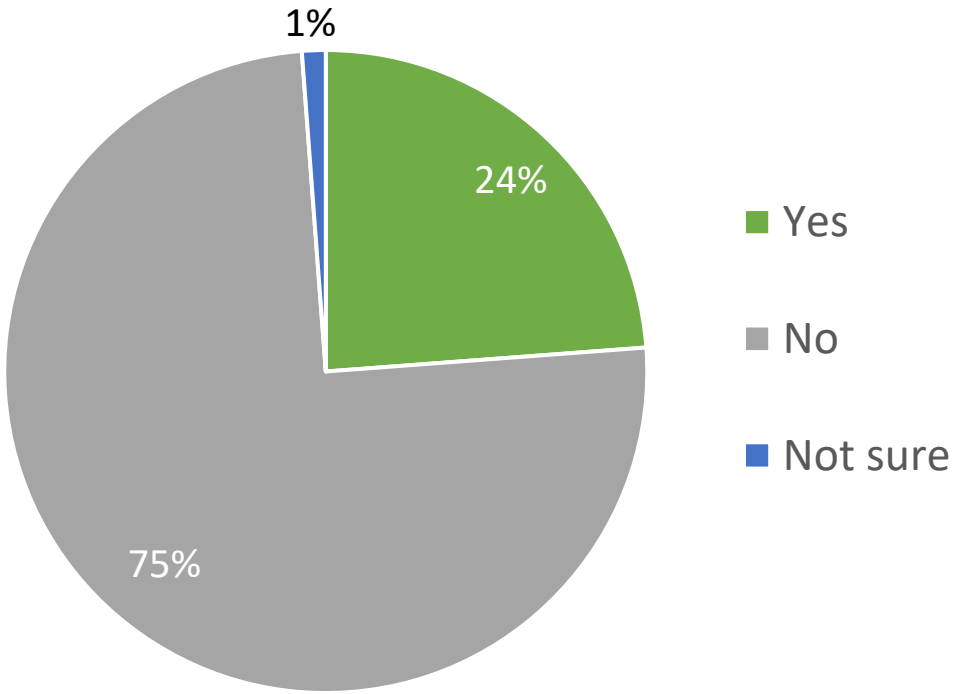
ⓘ Start presenting to display the poll results on this slide.

Audience Poll Results

Have you changed your Pinot noir yield targets in the past 5-8 years?



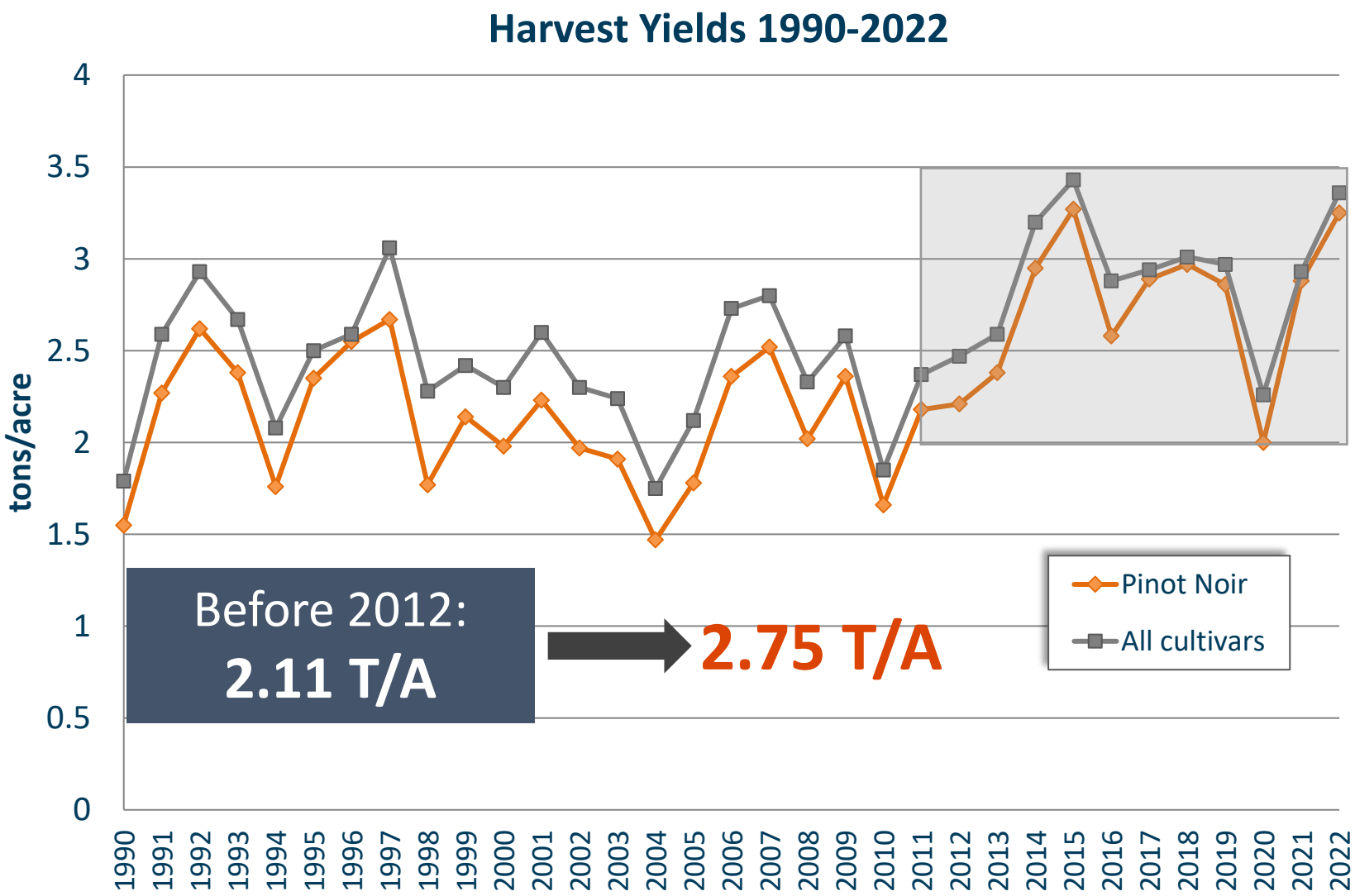
Is this your first time learning about yields other units than tons per acre (i.e., pounds per foot)?

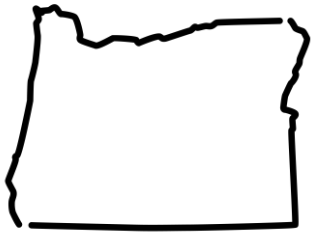


Audience Poll Results

What other cultivars have you modified yields over the past 5-8 years?

Oregon Yield Variability History





Years since yield management research began

USDA-NASS 1990-2012, SOURCE 2012-2017, U of O 2018-2023

Acknowledgments

- Faculty Research Assistants
  - Louis Delelee
  - Cody Copp
  - Annie Chozinski
  - Amelia Doyle
  - Michael Kennedy
  - Kelli Whisenhunt

- Graduate Assistants
  - Mathew Lange
  - Jeremy Schuster
  - Justin Litwin
  - Miranda Ulmer
  - Alison Reeve
  - Dionne Uzes

- Undergraduate Assistants
  - Maya Greydanus
  - Louis Corneaux
  - McKenzie Blaylock
  - Taylor Boquist
  - Sierra Laverty
  - Erica Miller
  - Victoria Skillman

Questions?

Patty Skinkis, PhD
Professor & Viticulture Extension Specialist
patricia.skinkis@oregonstate.edu
541-737-1411

Oregon State University
Extension Service