

Sierra Seed Zone Study

California Native Grasses

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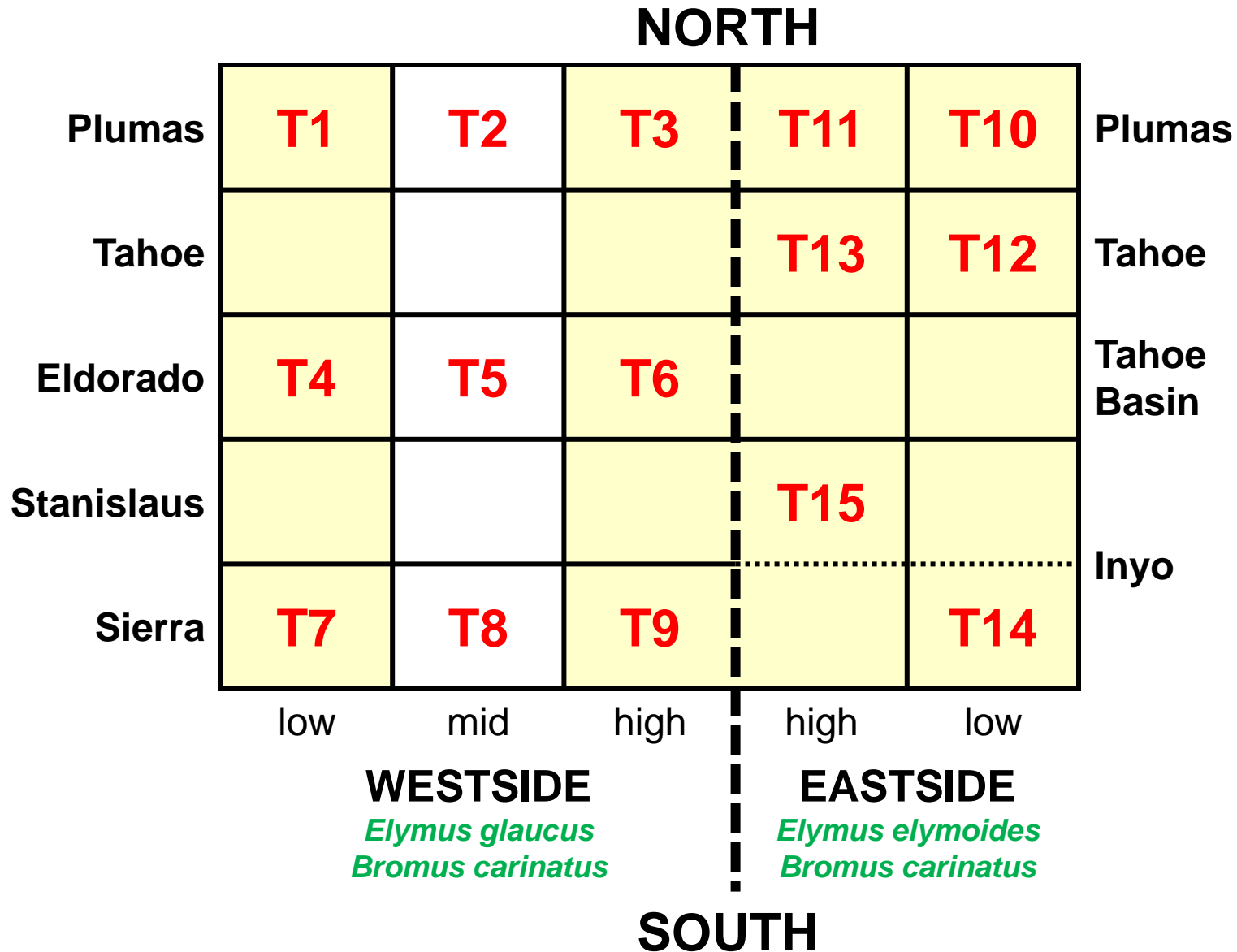
U.S. Forest Service

Pacific Southwest Regional Geneticist





Geographic Operating Framework



Seed Transfer Tests

- **Move across NFs** same elevation, same side
 - move north
 - move south
- **Move across NFs and Elevation** same side
 - move north and down
 - move south and up
- **Move across Sierra Crest** onto Inyo
 - move down or same elevation



Traits Measured

- 1st, 2nd, 3rd year **survival**
- plant **damage**: rust, browse intensity
- mean **leaf width**: 3 longest per plant
- **culm**
 - **count**
 - **height**: tallest
 - **total length**: count × height



Survival

1st year - 2005

- >60% in: 8 of 9 **blue wild rye** tests
5 of 6 **squirreltail** tests
11 of 13 **California brome** tests

2nd year - 2006

- <60% in 16 of 28 tests
- replanted blocks or interplanted in fall

3rd year - 2007

- 3 – 85% survival
- data sufficient to show trends



Mammoth

8700 ft

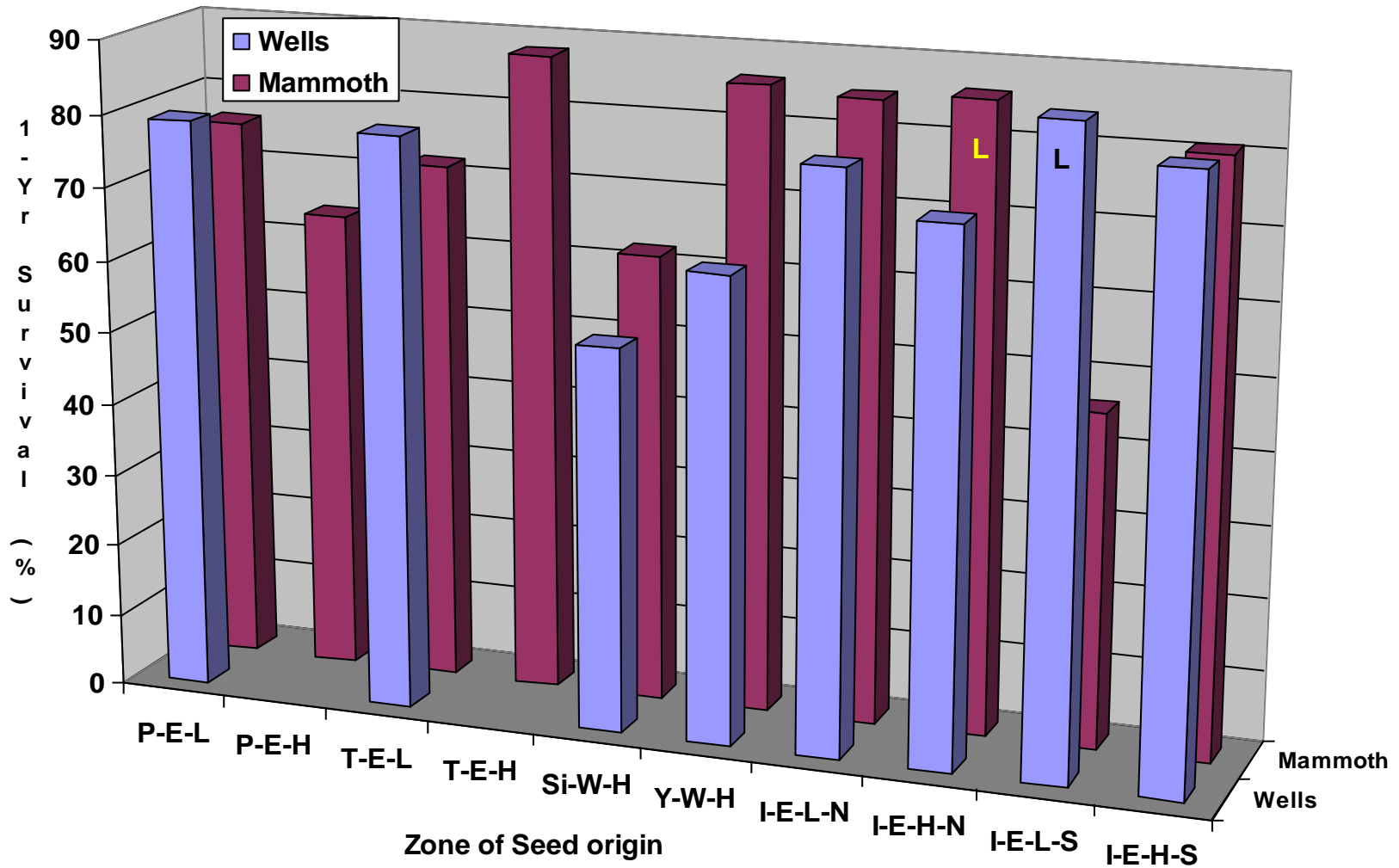


Wells

6500 ft

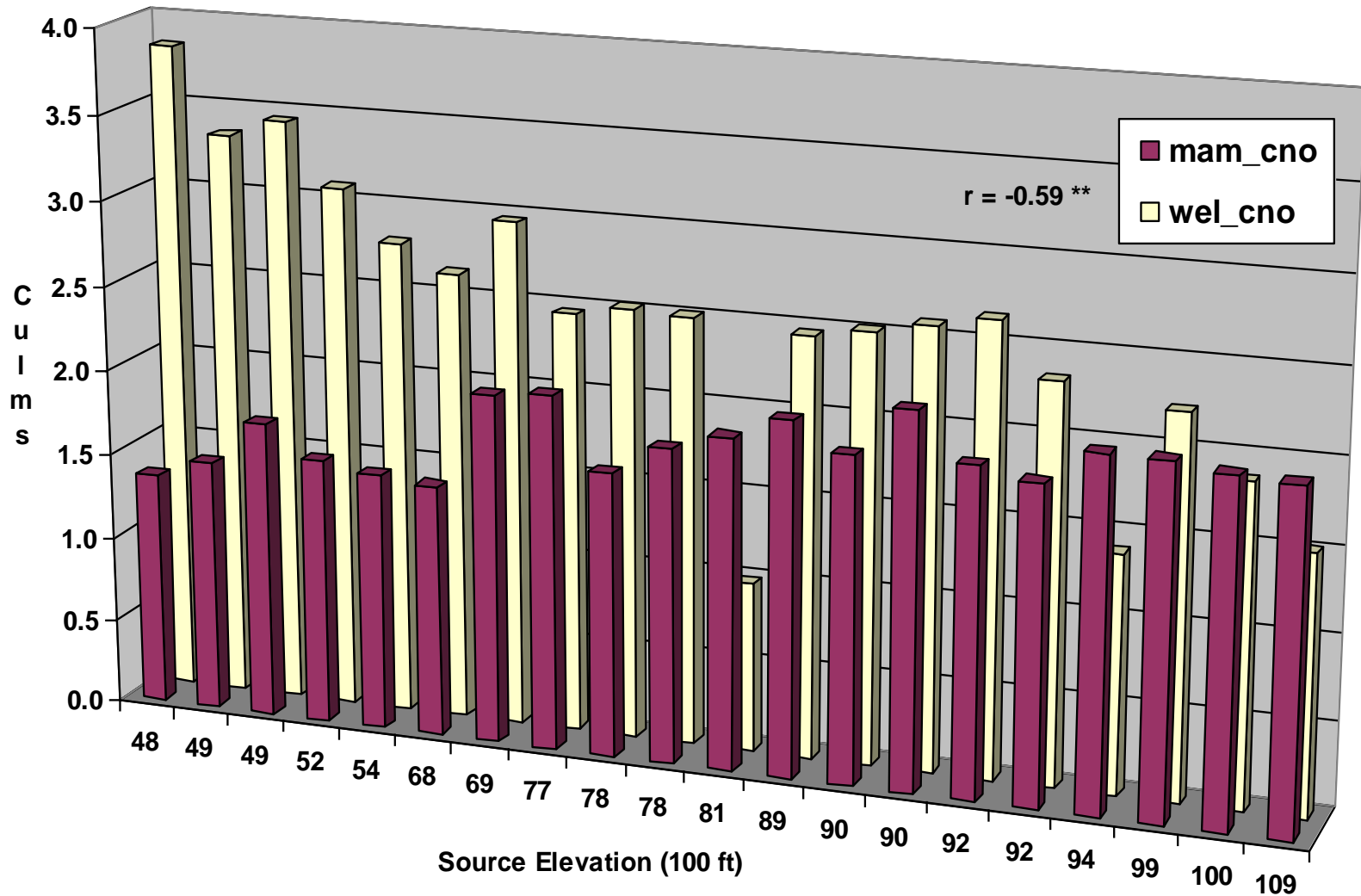
Survival at Mammoth and Wells

Survival of *Elymus elymoides* seed sources at Inyo test sites



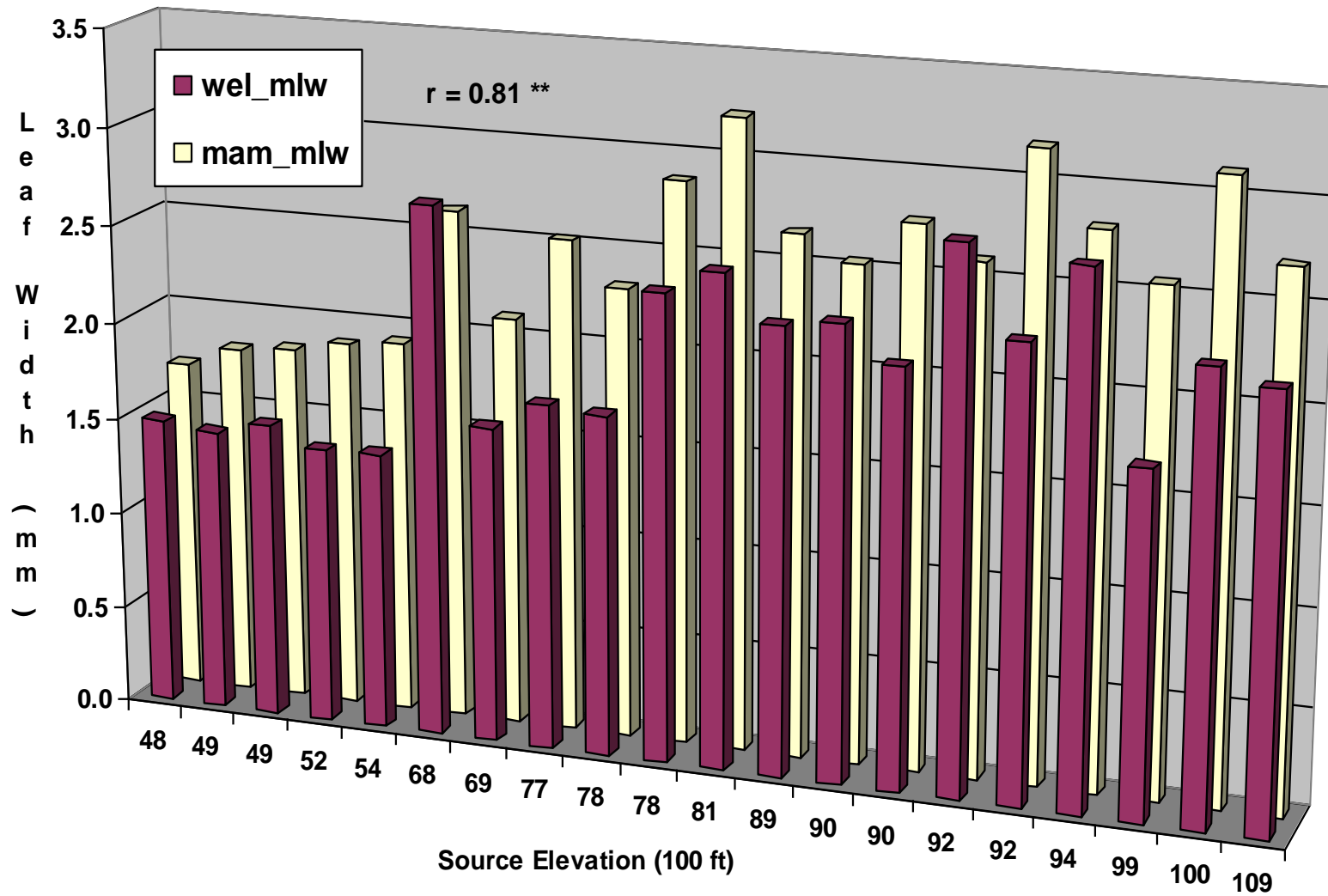
Seed Lot × Site (G×E) Interaction: Number of Culms

Sierra Seed Zone Study: *Elymus elymoides*: 20 Inyo NF Lots



Leaf Width by Seed Lot and Site: No G×E

Sierra Seed Zone Study: *Elymus elymoides*: 20 Inyo NF Lots



Multivariate Analysis for Geographic Pattern

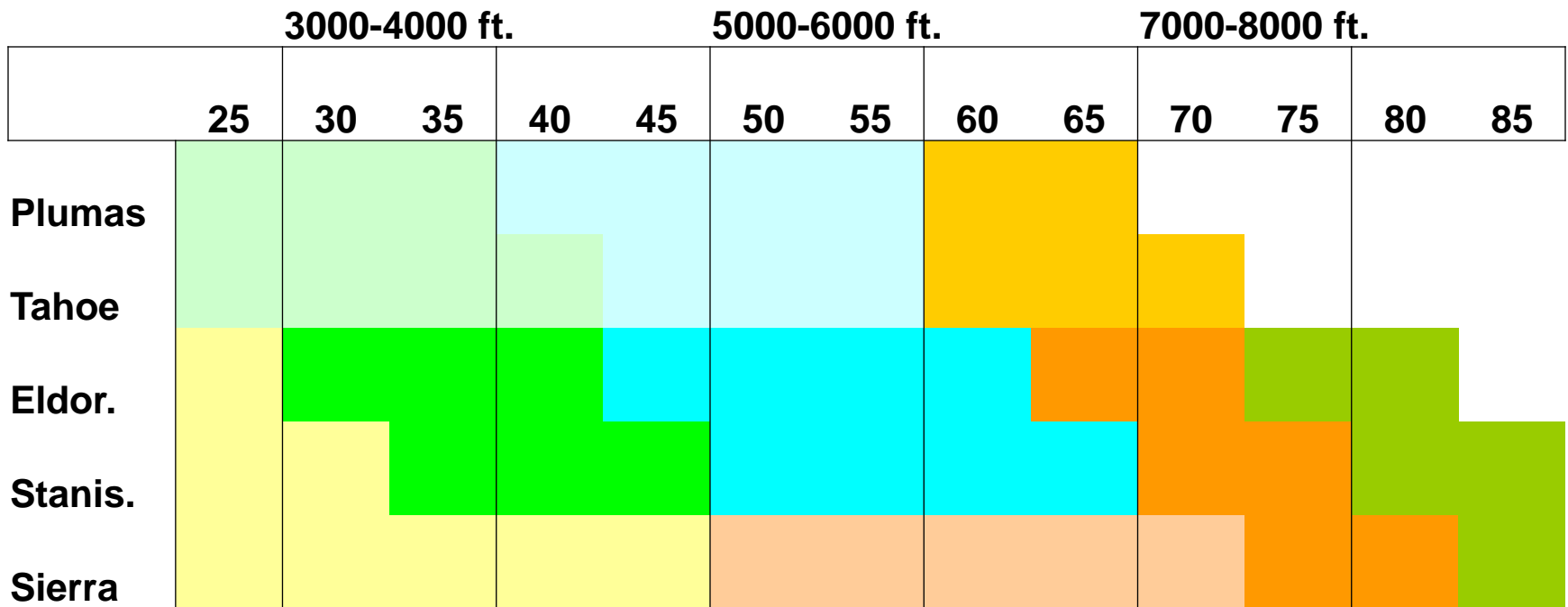
Seed Lot	<u>Trait Response</u> Y variables	<u>Geographic Origin</u> X variables
1	leaf width # culms culm height survival	latitude longitude elevation cross products
2		
etc.	Find traits that correlate well with geographic origin. Maximize joint linear relationship using Canonical Correlation.	



Synthesis of California Brome

9 seed zones

Westside



Survival Strategy: Trait Correlations

Climate Stress

- roots, seeds, pollen
- xeric / hot / cold
- **reproductive capacity**
- culm production

Competition Stress

- vegetative growth
- mesic / mild
- **photosynthetic capacity**
- leaf production

Balancing act with trade-offs: leaf production vs culm, seed, pollen production



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QUESTIONS?

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