

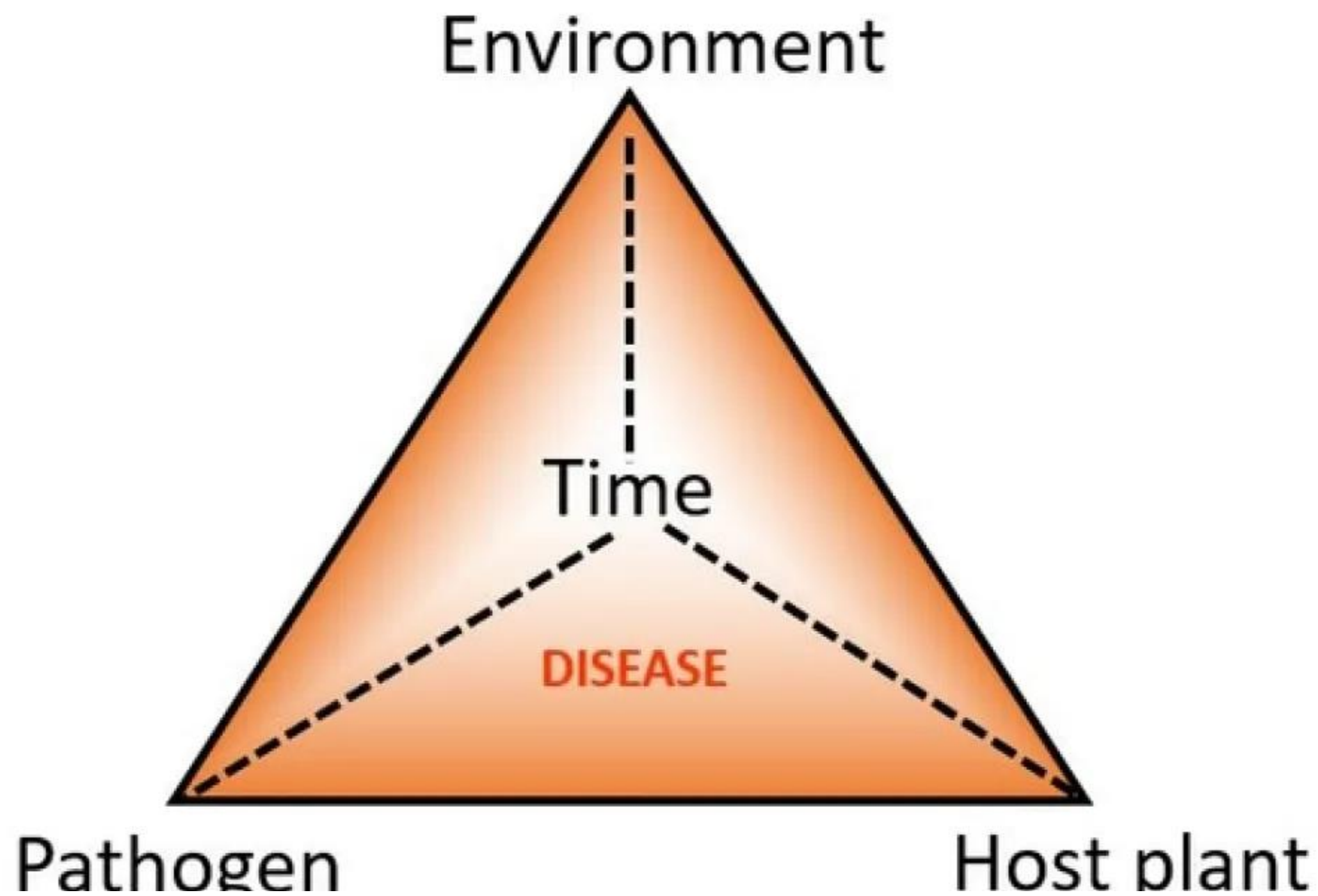




Salt and water stress effects on charcoal rot development in summer strawberry

Oleg Daugovish, Andre Biscaro,
Maripaula Valdez-Berriz, Abigail Brondos
(UC-ANR) and Peter Henry (UC Davis);

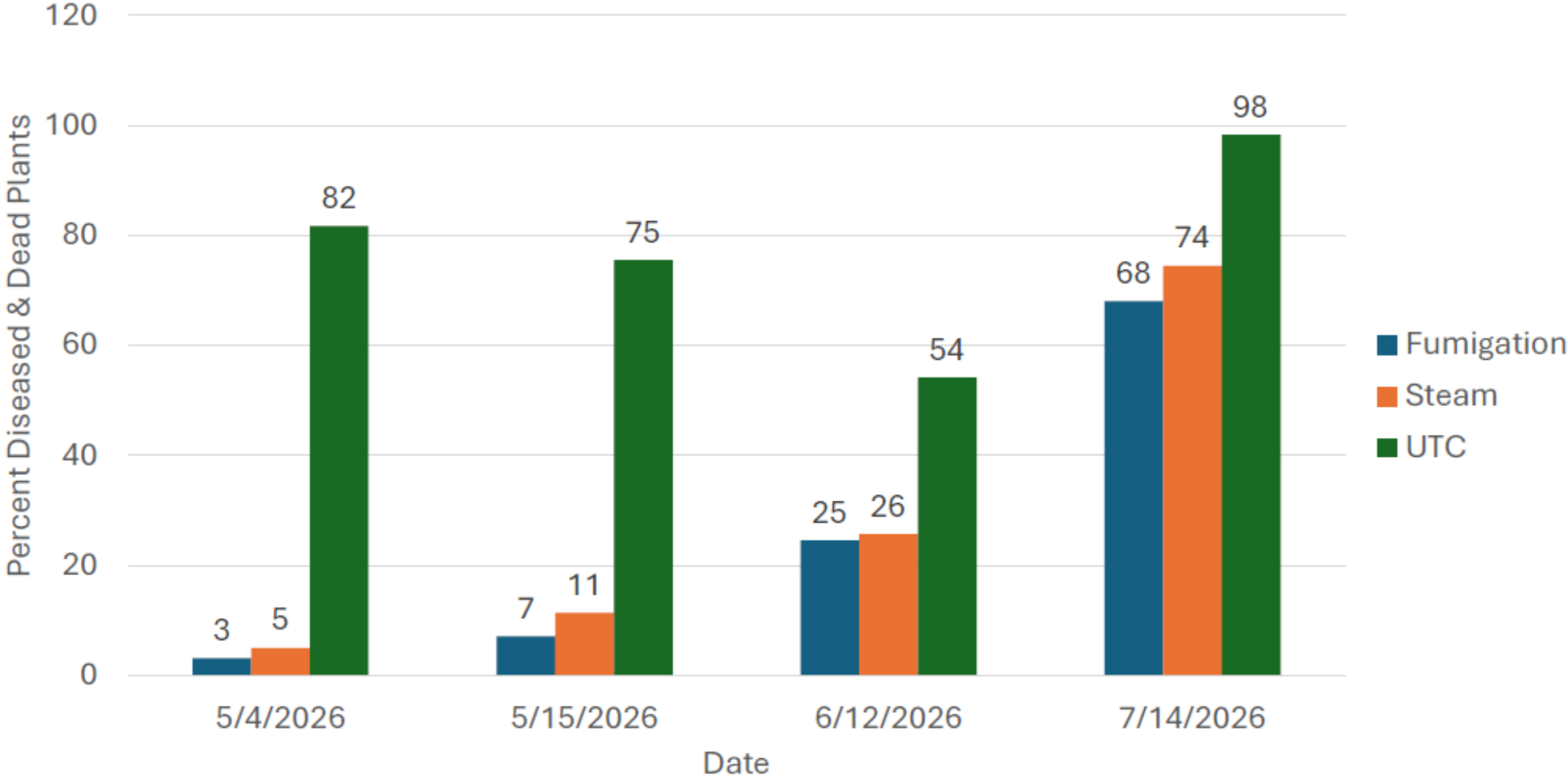
SCRI grant funding



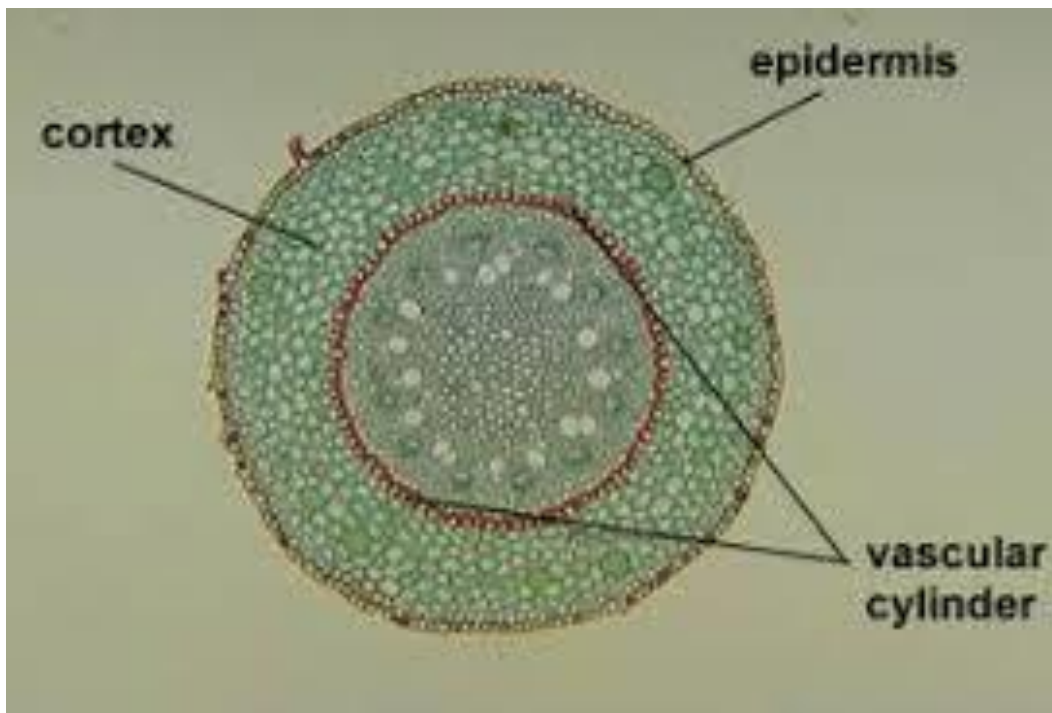
Optimum temperatures

- *Macrophomina* charcoal rot: 86°F to 95°F
- *Fusarium* oxysporum f. sp. fragariae: 77°F to 82°F
- *C. esculentus* – yellow nutsedge: 75-90°F

Fusarium wilt incidence in Monterey, 2026



Fungal growth in vascular tissue



At Camarillo , CA summer planting

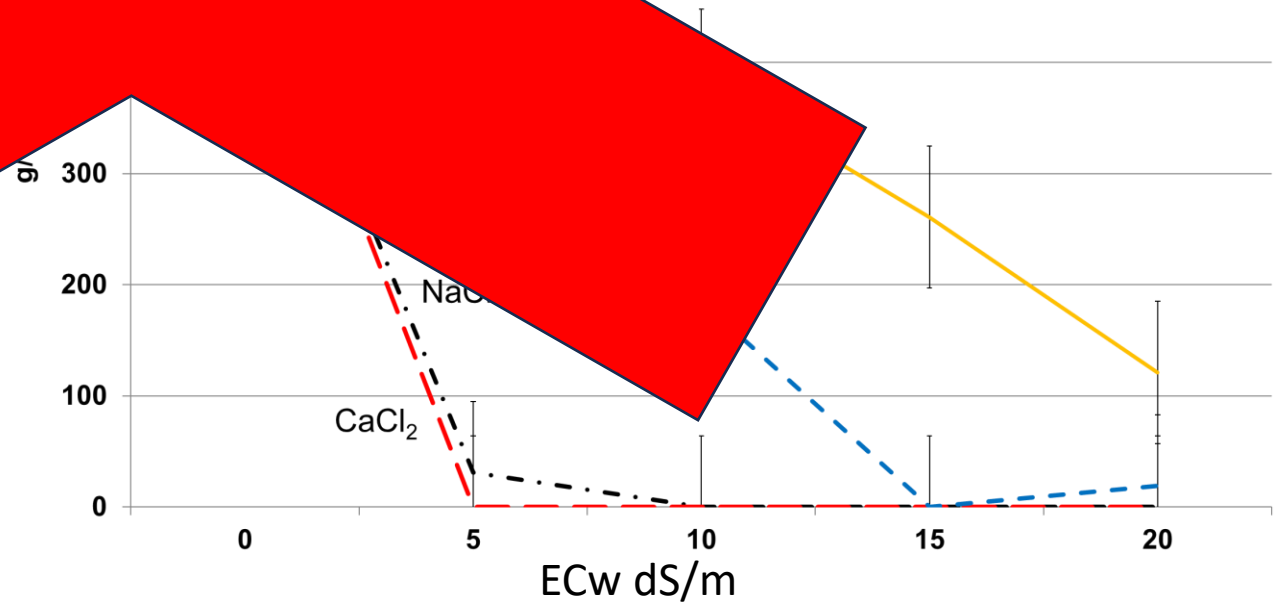
- Portola or Eclipse
- With or w/o *M.phaseolina* inoculum in planting holes
- 5 factors:
 - 3 salt combinations via drip irrigation,
 - reduced irrigation and
 - grower standard irrigation (monitored by sensors and soil sampling)

50 g of infested sand placed at ~10 inches depth in the planting holes, delivered via plastic funnel

DON'T KILL, BUT STRESS!



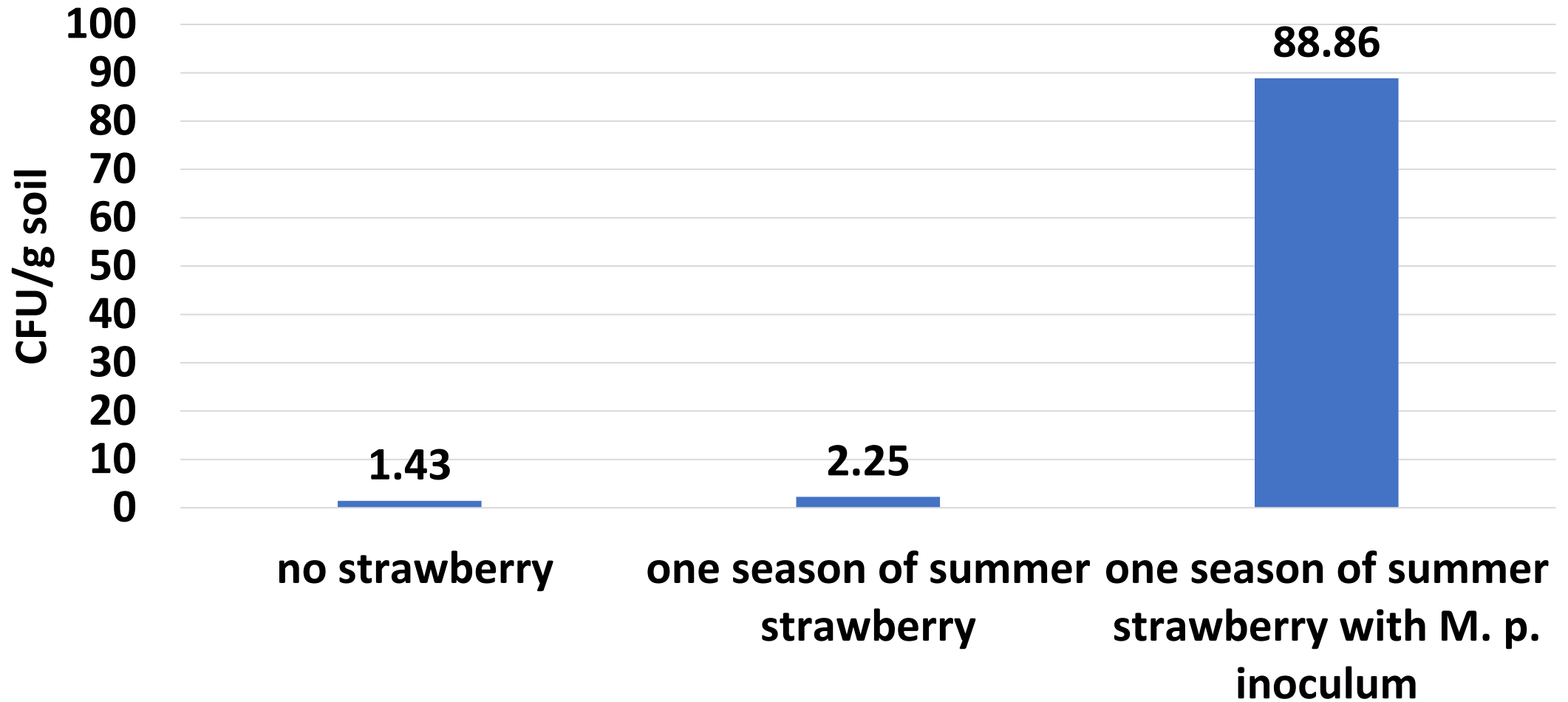
High density of Macrohomina in F



	ECw (dS/m)	Cl (meq/l)	Moisture threshold (cb)
Control	1.3	1.6	10
Water stress	1.3	1.6	60/30
Salt 1 (Cl)	1.8	6.8	10
Salt 2 (Clx2)	2.4	13.2	10
Salt 3	3.1	4.8	10



***M.phaseolina* in soil 2 years after 350 lb/A Pic flat**



30 Sept., 2024

Eclipse w/o M.p



Eclipse with M.p. inoculum



30 Sept. , 2024

Portola w/o M.p. inoculum

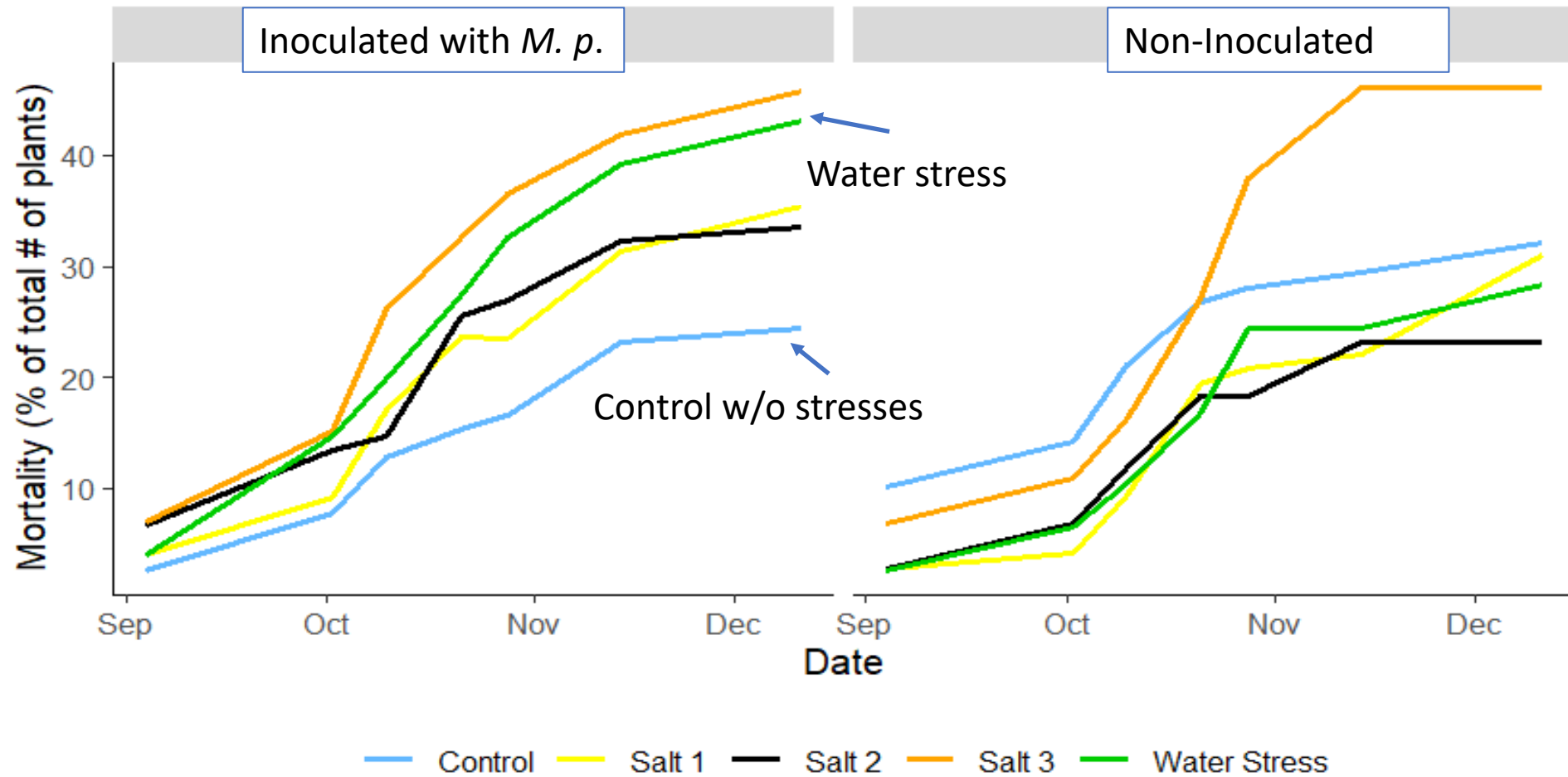


Portola with M.p. inoculum

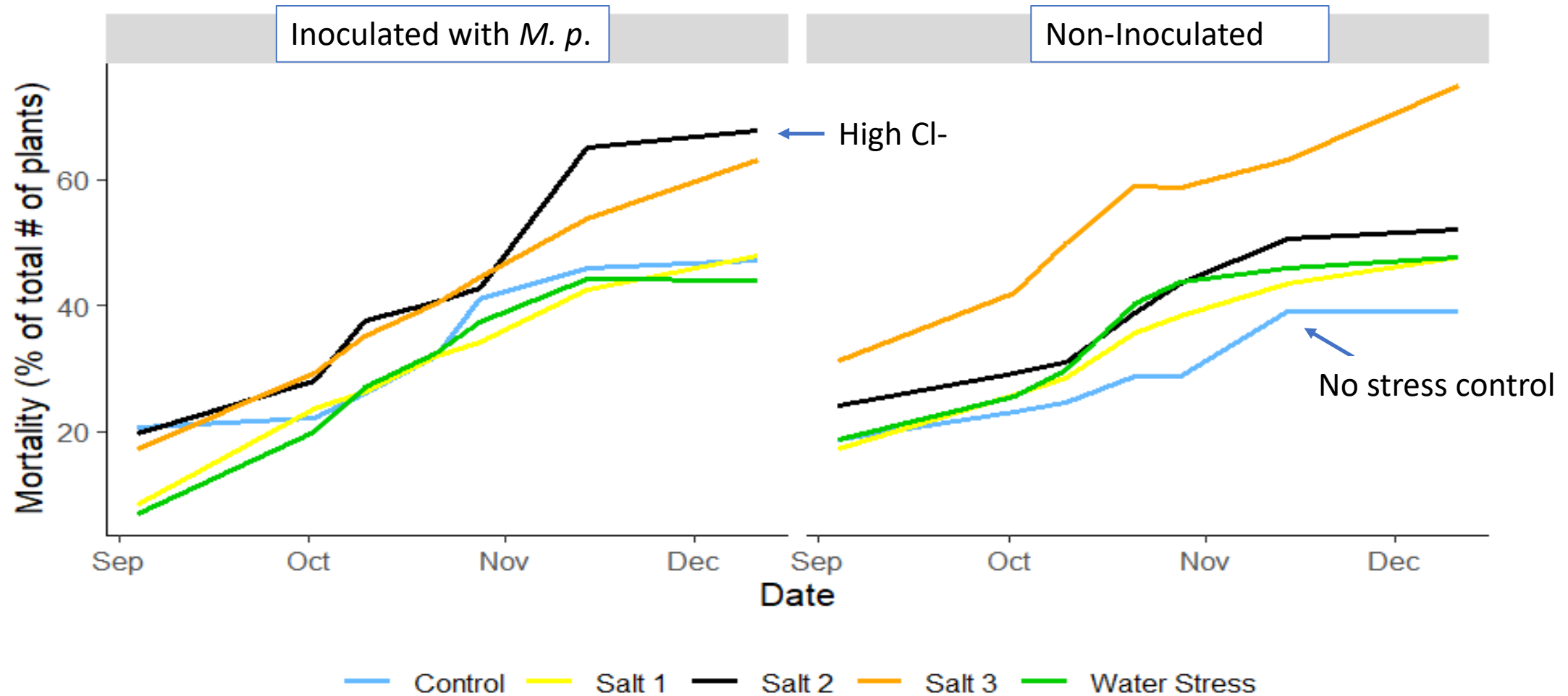


2024-25 season

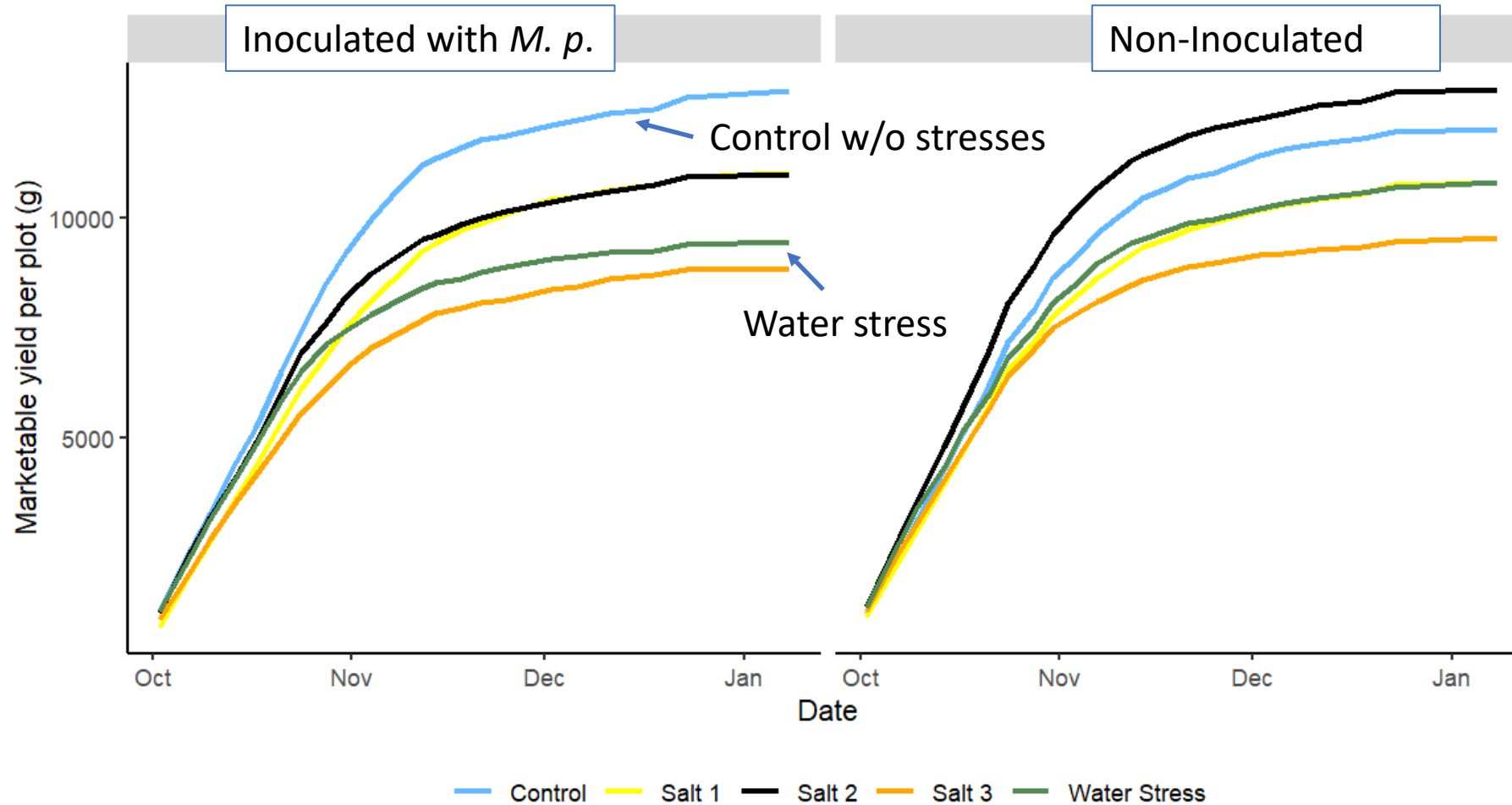
Eclipse: mortality



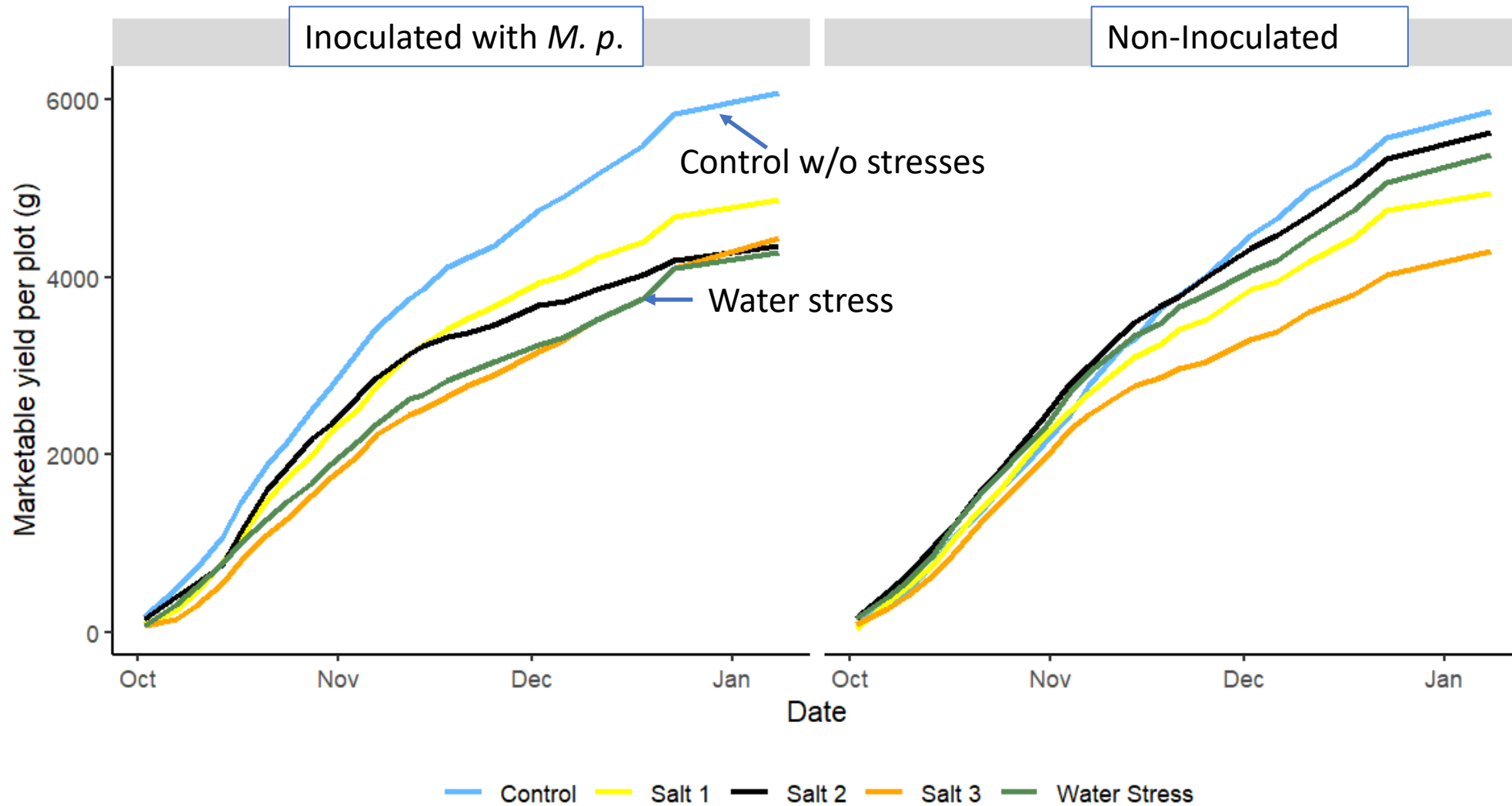
Portola: mortality



Eclipse: marketable yield



Portola: marketable yield

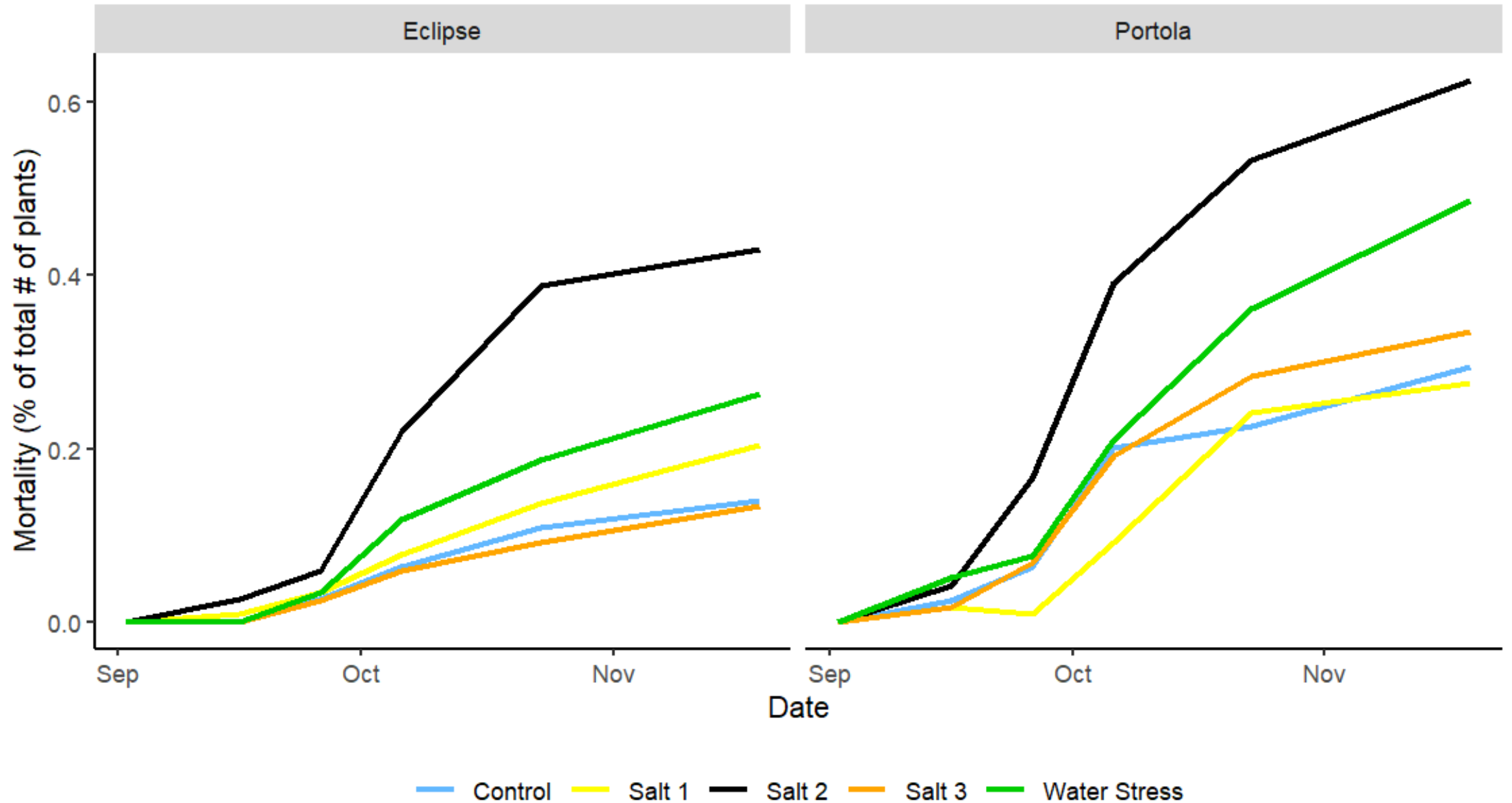




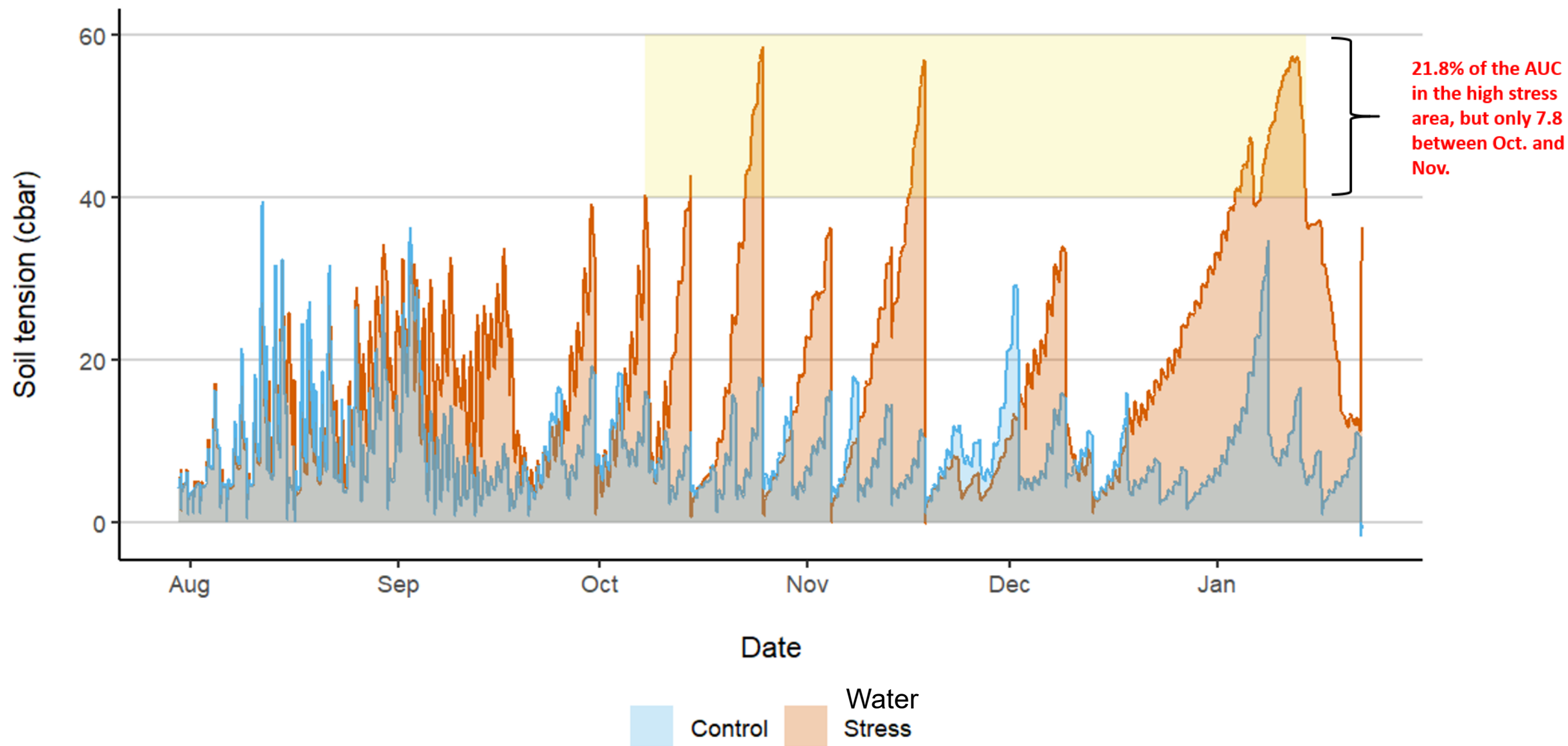
2025-26 trial:

- **Applying salt treatments earlier (pre-plant)**
- **First die-back on Sept 3**

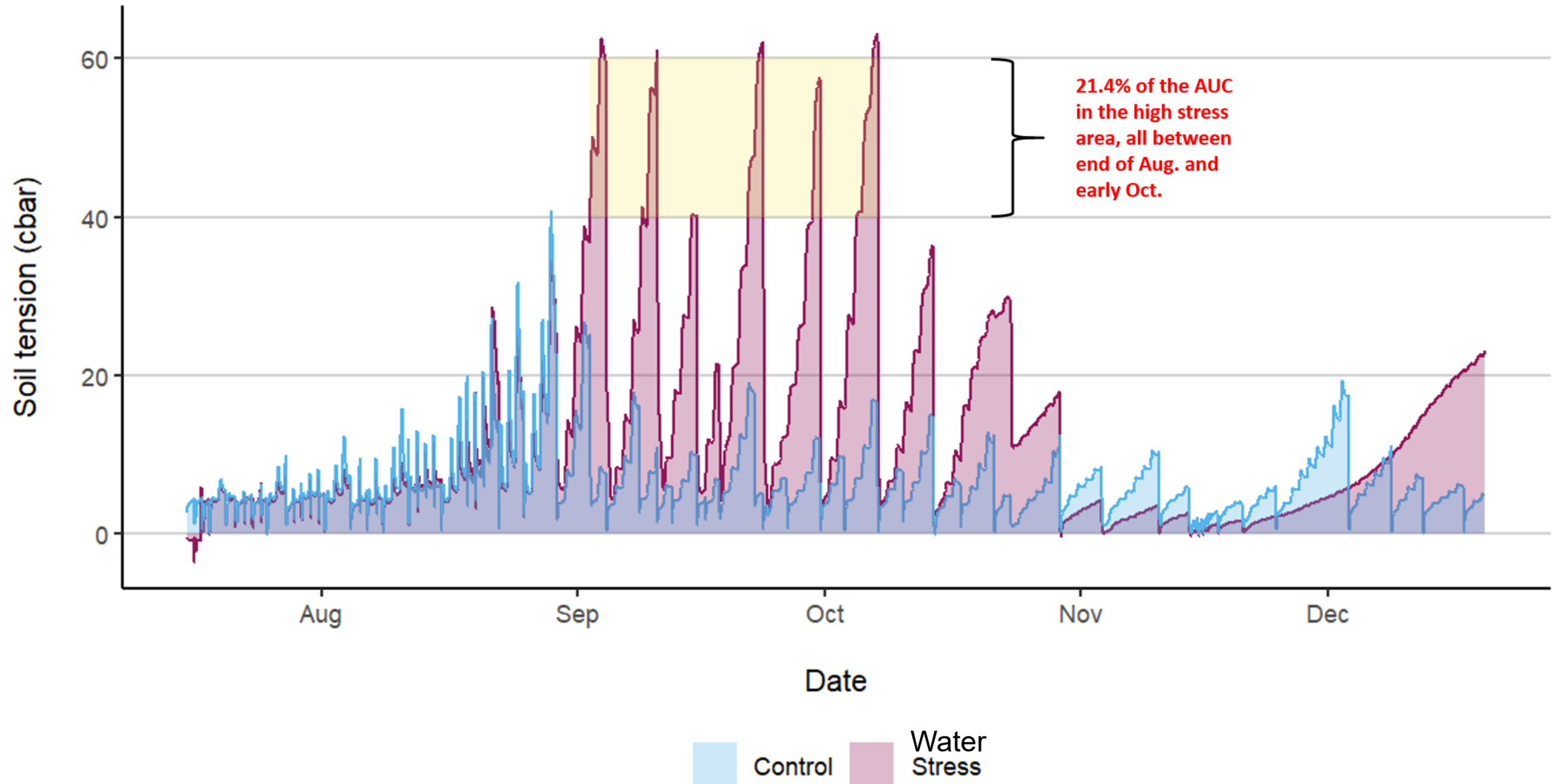
MORTALITY



Soil Tension in 2024

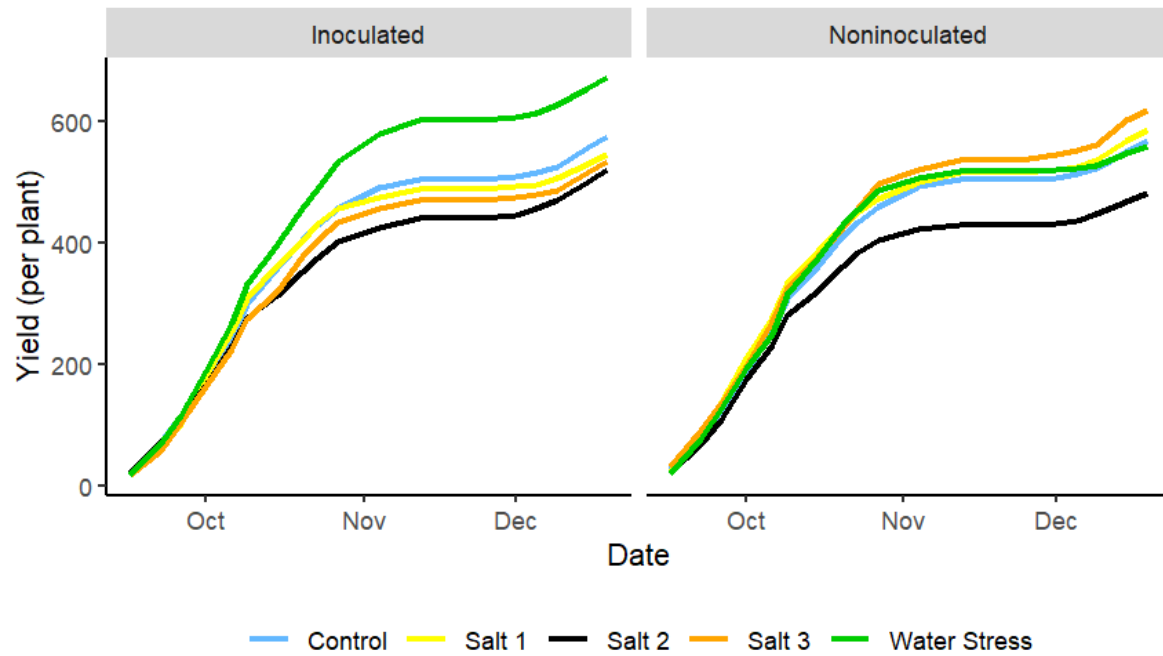


Soil Tension in 2025

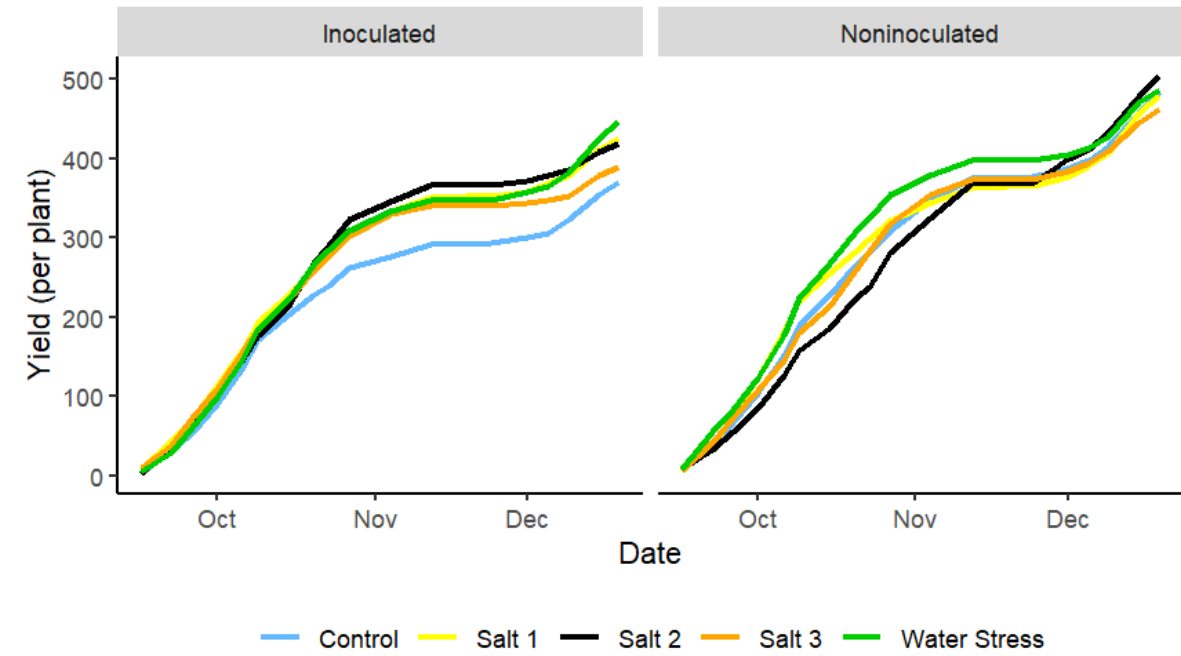


Yield per live plant

Eclipse

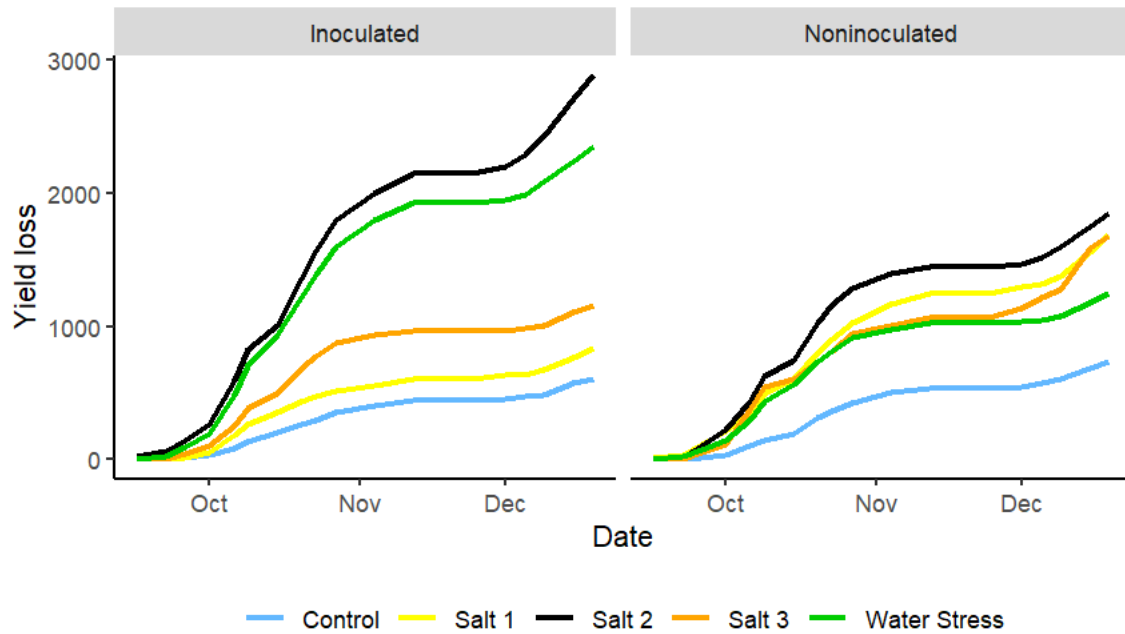


Portola

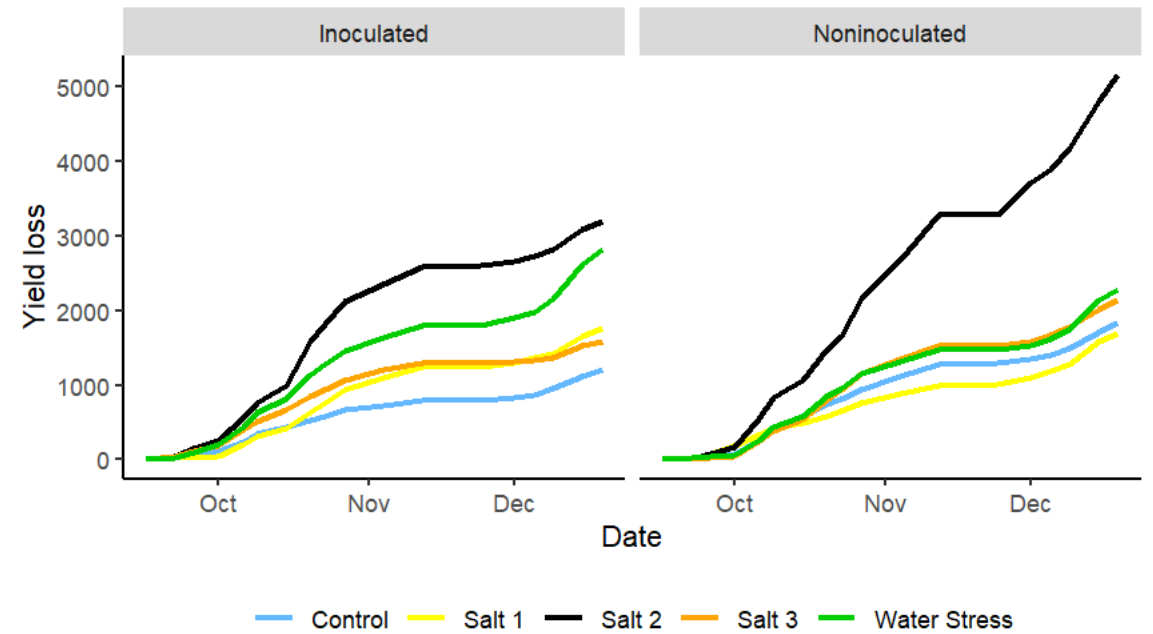


Yield Loss affected by Mortality

Eclipse



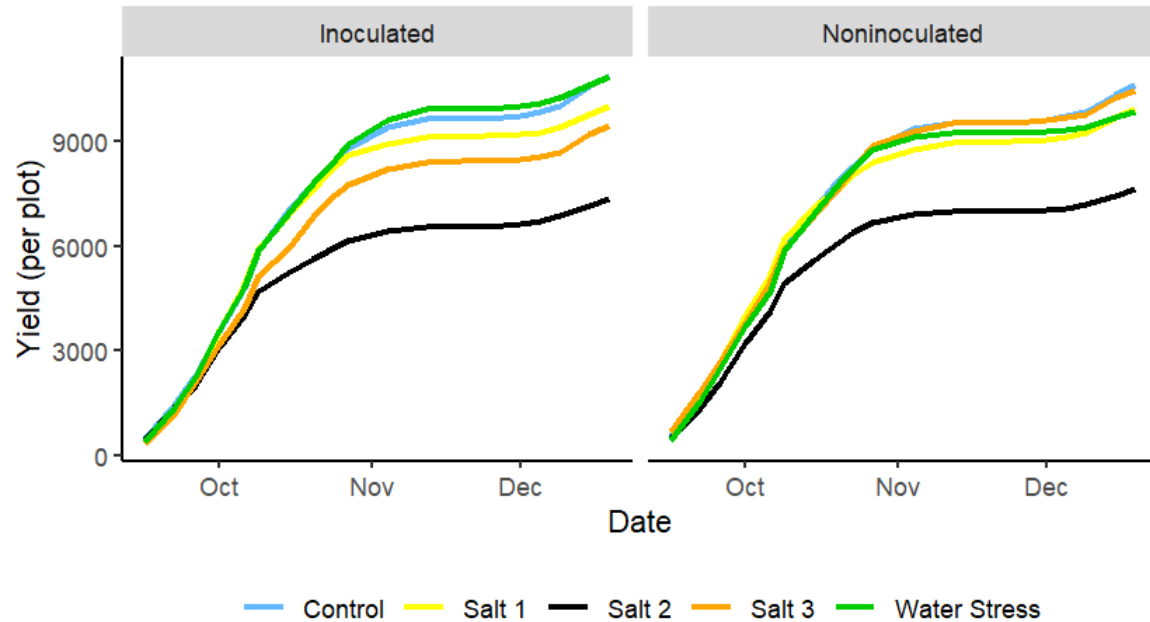
Portola



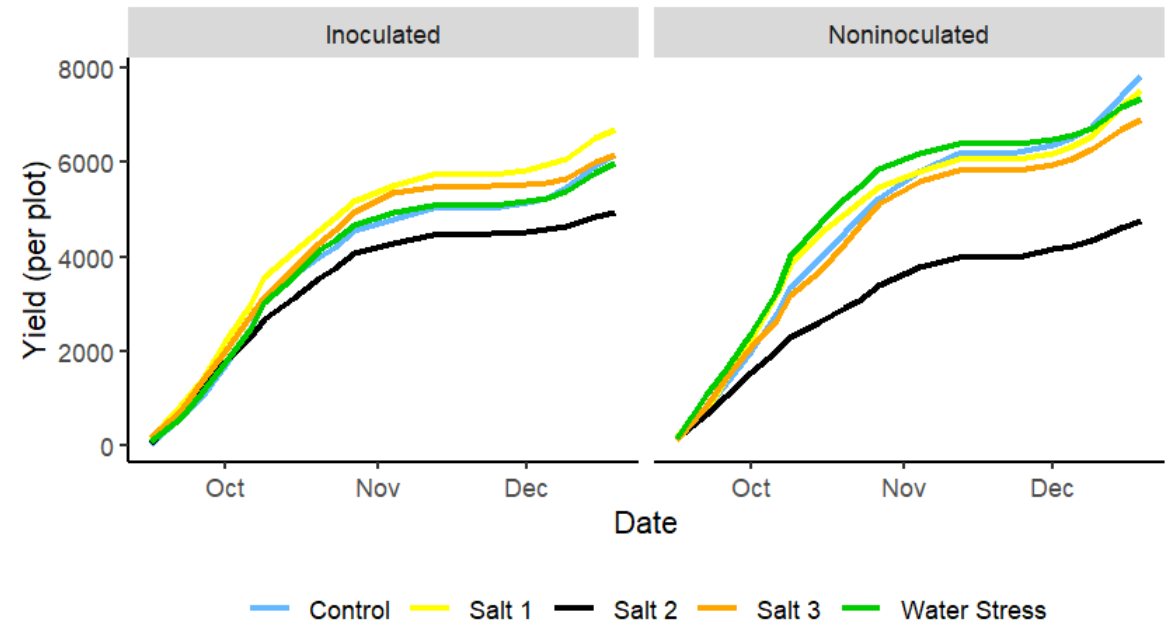
Yield per plot

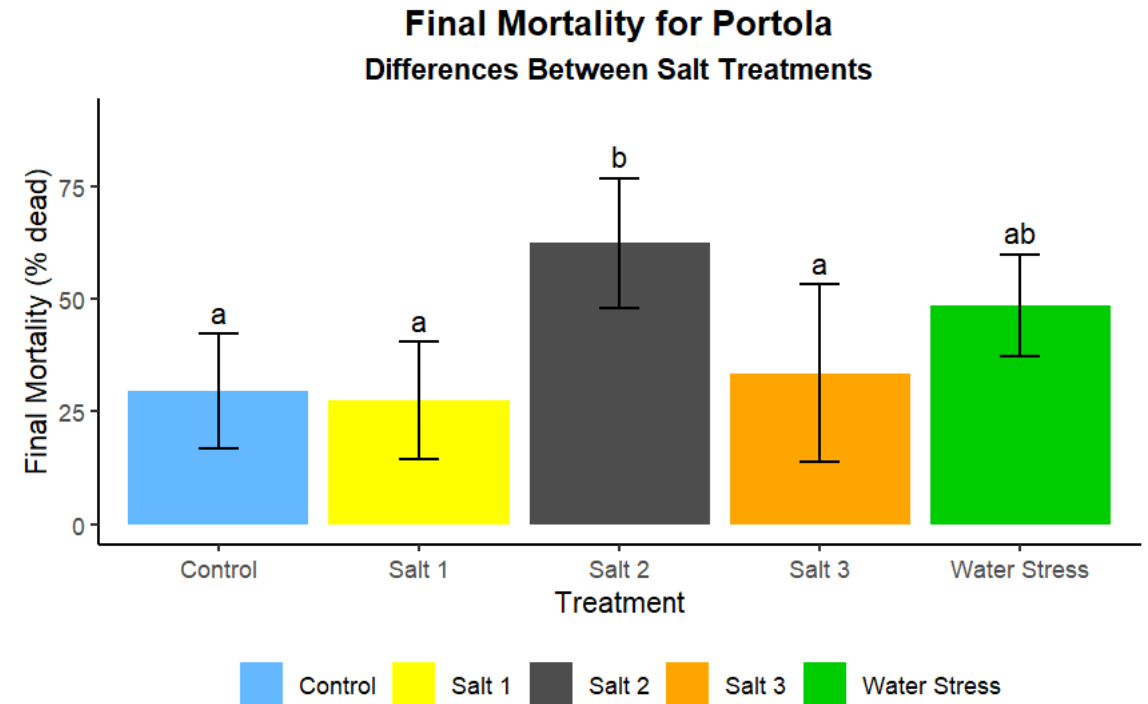
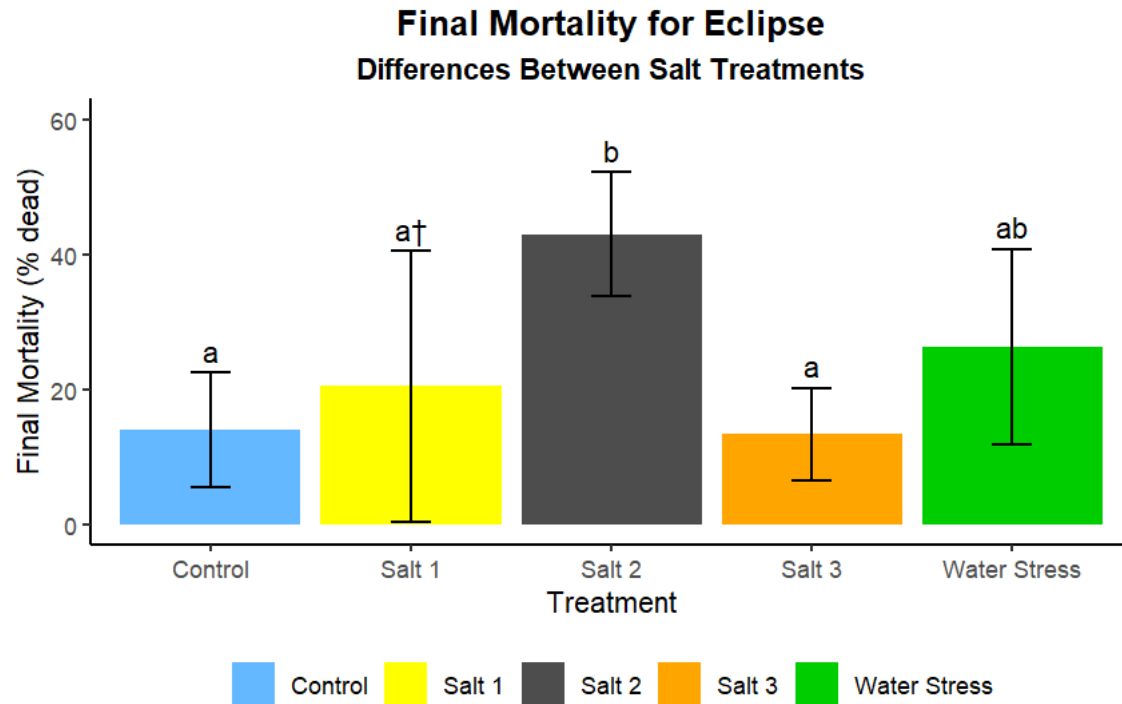
(standardized yield per plot)

Eclipse



Portola





Different letter represent significant differences for $p < 0.05$, except when † is shown, then $p < 0.1$.

Summary

- Portola had lower fruit production and marketable yield than Eclipse, both very susceptible to *Macrophomina*
- Soil Temperature drives mortality more than pathogen concentration
(Contact with infested soil starts it)
- Yields of life plants in infested soil not signif. affected by treatments
- High Cl, water stress: Consistent trend in increasing mortality and reducing marketable yields
- High Cl : Chloride accumulated in soil and plant tissues
- Rain, irrigation leach salts and reduce ion concentrations in root zone