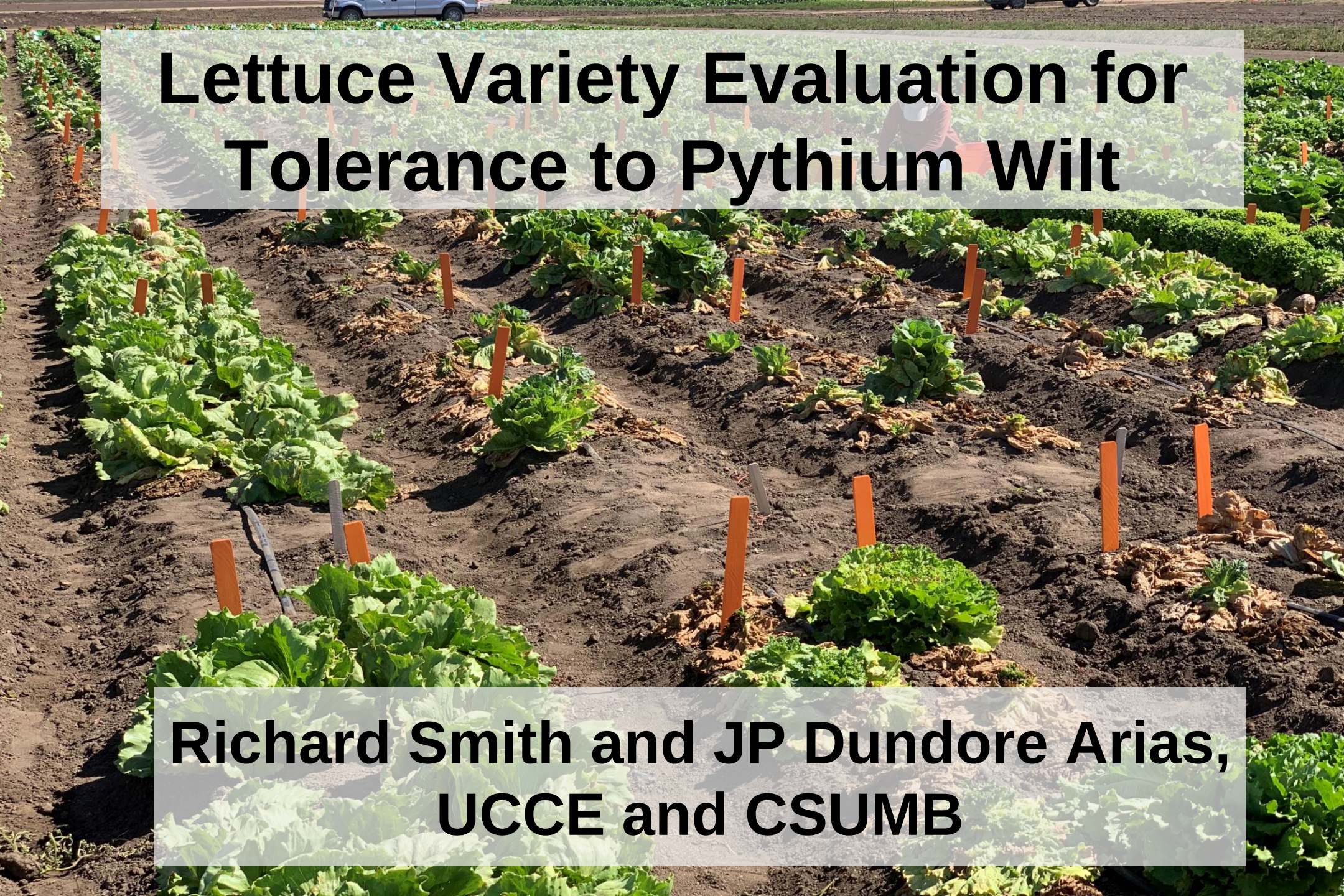


Lettuce Variety Evaluation for Tolerance to Pythium Wilt

Richard Smith and JP Dundore Arias, UCCE and CSUMB

2022 Fungicide Trials

- **Three trials were conducted with the standard Ridomil Gold (2 pints/A) applied at-planting, thinning and rosette**
- **Two biologicals Bexfond and Minuet were also tested**
- **Materials were sprayed on and watered in or injected into the drip irrigation system**
- **No significant reductions in Pythium wilt were observed among the treatments**

Variety Trial for Pythium Wilt Tolerance

- **Direct seeded on July 12 at the USDA Research Farm on a site that had significant incidence of Pythium wilt in 2021**
- **53 varieties from 10 seed companies were replicated 4 times in plots 40” x 25’**
- **Plots were visually evaluated on three dates. Lab evaluations: Pythium evaluations (JP Arias) three dates; Fusarium evaluation of selected plants (Alex Putnam) one date; INSV evaluations (Kelley Richardson)**

Seed Companies Participating

Brinker Orsetti	Rijk Zwaan
Enza Zaden	Sakata
Greengo	Salinas Valley Seeds
Nunhems	Seminis
Pinnacle	Vilmorin

Company	Variety	Company	Variety	Company	Variety	Company	Variety
Brinker Orsetti	Kodiak	Nunhems	Nun 00276	Sakata	Meridian	Seminis	Caracola
Brinker Orsetti	BOS 1687	Nunhems	Nun 00300	Sakata	Regency	Seminis	Clerac
Brinker Orsetti	BOS 1566	Pinnacle	ICE 101	Sakata	7346	Seminis	Loubressac
Brinker Orsetti	Red Fusion	Pinnacle	ICE 102	Sakata	ROM 1184	Seminis	Panoramis
Brinker Orsetti	BOS 1261	Pinnacle	ICE 103	Sakata	Teton	Vilmorin-Mikado	22PT/01
Enza Zaden Vitalis	Adicamp	Pinnacle	ICE 104	SVS	Armstrong	Vilmorin-Mikado	22PT/02
Enza Zaden Vitalis	Telluride	Pinnacle	ICE 105	SVS	Molera	Vilmorin-Mikado	22PT/03
Greengo	SR2-21-16B	Pinnacle	ROM 201	SVS	Paraiso	Vilmorin-Mikado	22PT/04
Greengo	SR2-21-33B	Pinnacle	ROM 203	SVS	Primo	Vilmorin-Mikado	22PT/06
Greengo	Patton	Rijk Zwaan	Salvius	SVS	San Andreas	Vilmorin-Mikado	22PT/07
Nunhems	Copious	Rijk Zwaan	1024	SVS	San Miguel	Vilmorin-Mikado	22PT/08
Nunhems	Estiada	Rijk Zwaan	3262	SVS	SVS 107		
Nunhems	Momentous	Rijk Zwaan	3427	Seminis	Powerball		
Nunhems	Nun 06299	Sakata	Lockwood	Seminis	SVLC 4050		

Details on Pathogens Affecting the Varieties in the Trial

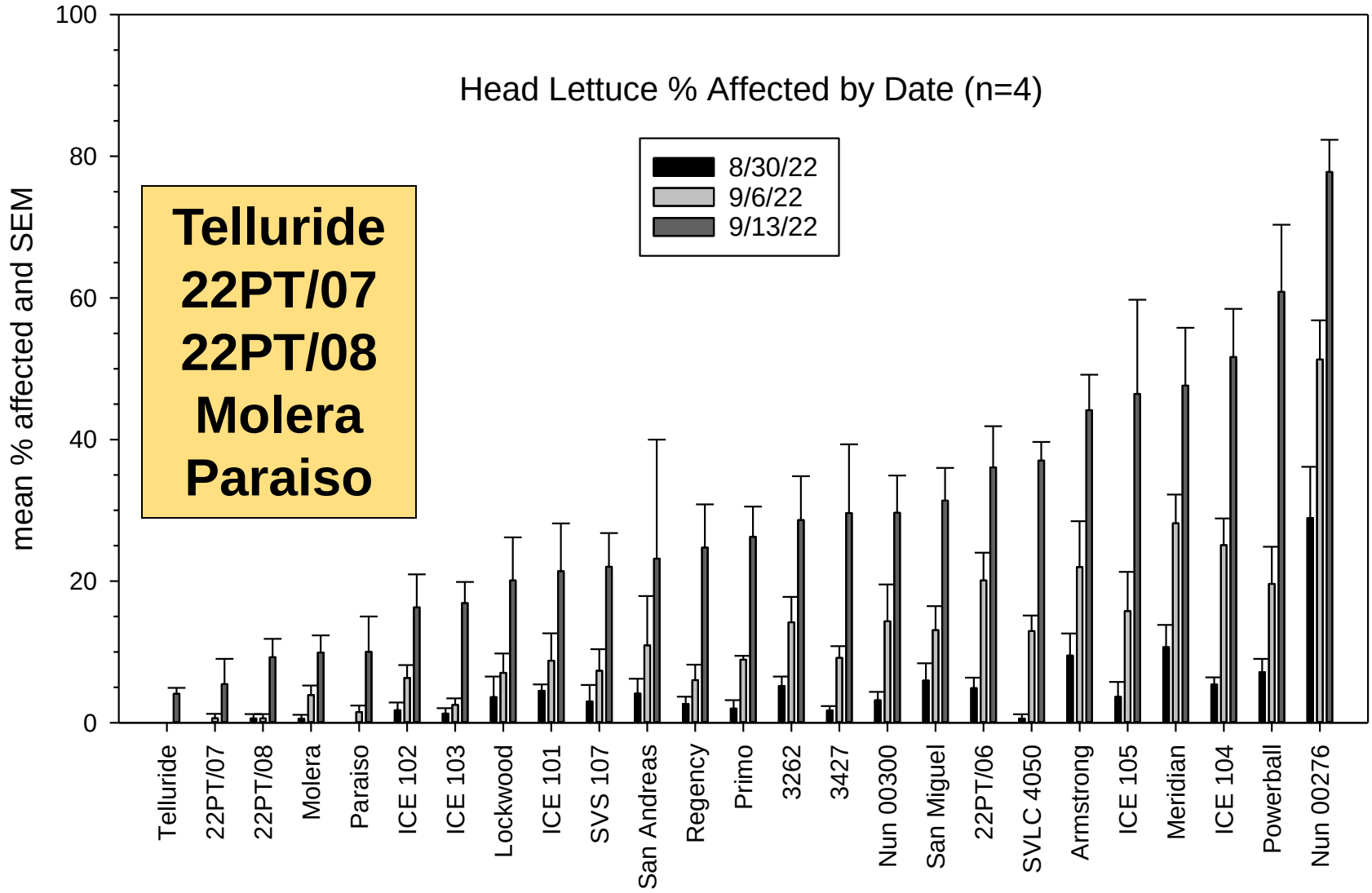
- All varieties from one rep were evaluated for Pythium wilt
  - Pythium wilt was consistently isolated from plants that were evaluated
- No Fusarium was detected from selected plants evaluated
- One sample evaluated by Steve Koike was positive for Verticillium wilt
- There was significant INSV in the trial and was evaluated by Kelley Richardson

Visual Evaluations

- **Visual evaluations consisted of counting plants in the plots that showed signs of wilting of the leaf tissue**
- **Confirmation of the causes of wilting were conducted by sampling wilted plants by JP Arias and selected plants by Alex Putnam**

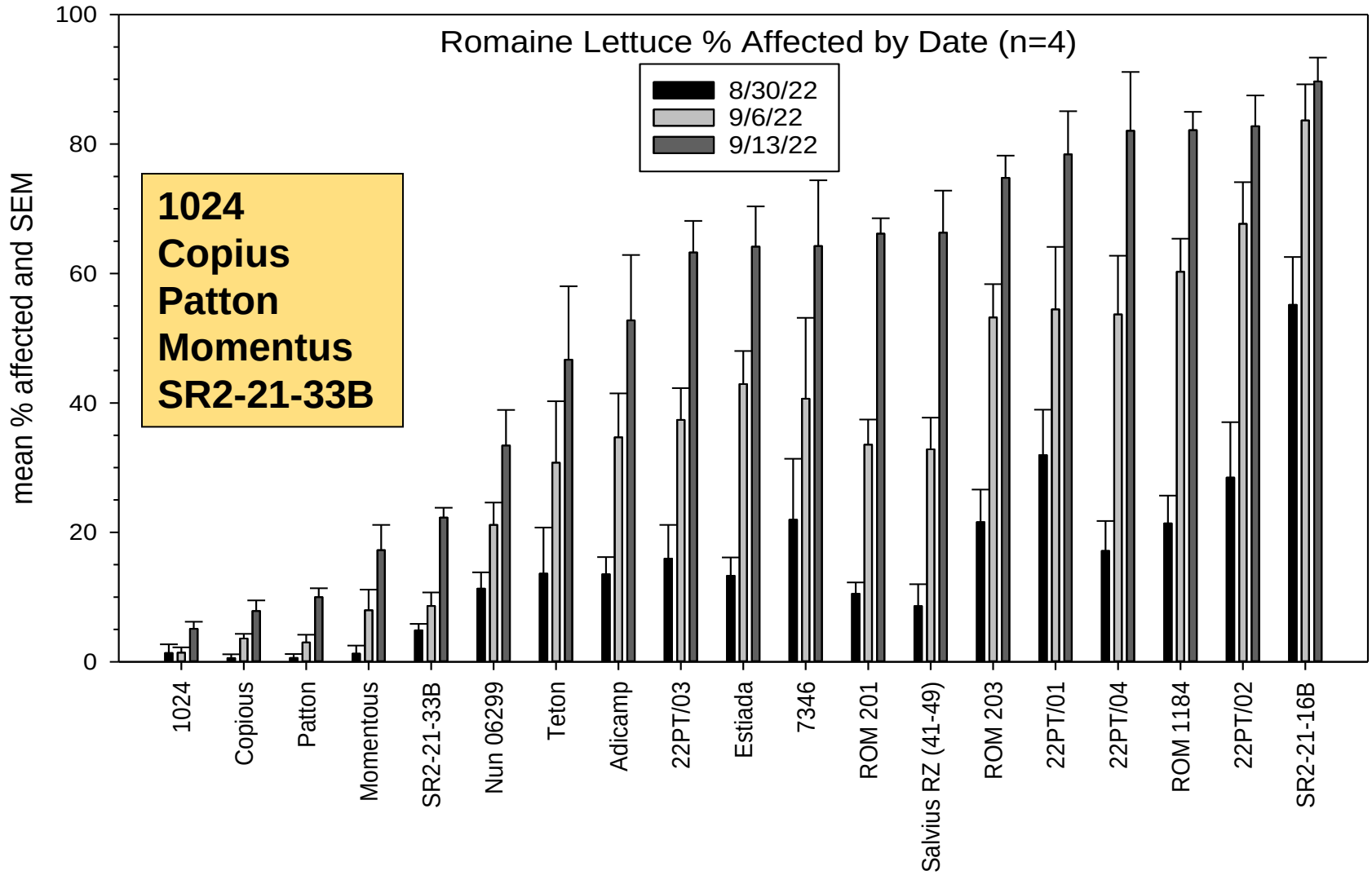
Head Lettuce Field Evaluaiton

Percent Infected Plants



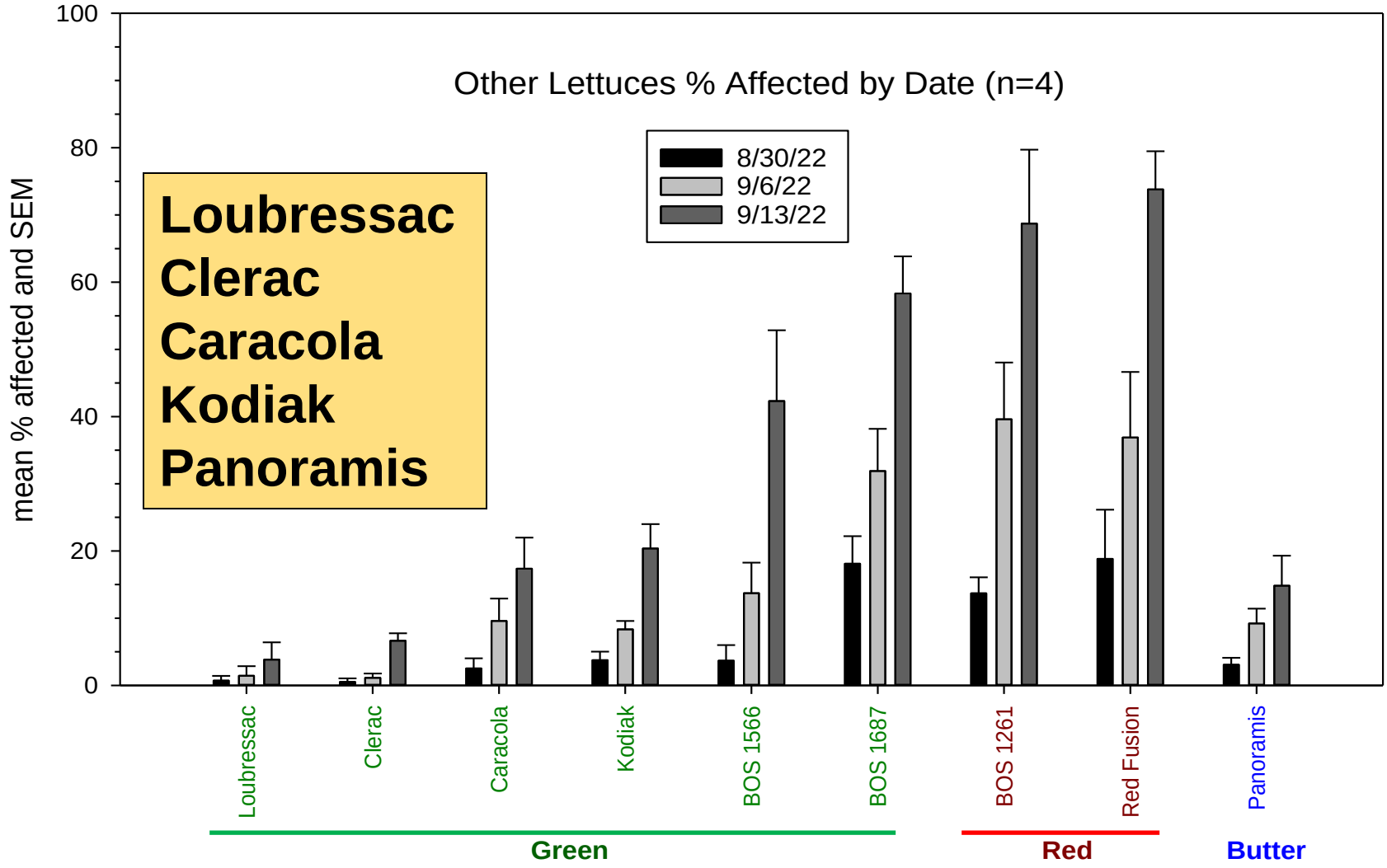
Romaine Field Evaluation

Percent Infected Plants



Other Lettuce Field Evaluation

Percent Infected Plants



Lab Evaluations

JP Dundore Arias, CSUMB

- **Evaluated on three dates**
- **Plants sampled in one replication**
  - **First two evaluations were of symptomatic plants**
  - **Third evaluation was of all plants symptomatic and asymptomatic**
- **All varieties eventually were found to be positive for pythium on the roots (even if they displayed no wilting)**
- **Some varieties had succumbed to Pythium by the first evaluation date and others later in the crop cycle - by the third evaluation date**

Healthy plant tops & rotted roots

<u>Varieties</u>:
Paraiso, *Head*
Loubressac, *Green*
22PT/08, *Head*
Powerball, *Head*
Clerac, *Green*
Caracola, *Green*
Nun 00300, *Head*
22PT/07, *Romaine*

Healthy plants & some discoloration on roots

<u>Varieties</u>:
Patton, *Romaine*
Copious, *Romaine*
Telluride, *Head*
1024, *Romaine*

Overall, these varieties had "healthy roots" but with minor discoloration. They tested positive for Pythium. Apparently, the varieties can localize the infection and limit its destructive spread

Other Varietal Evaluations

- From April to October evaluations were conducted of collapsing plants in fields with multiple varieties.
- The majority of plants infected with Pythium were also infected with INSV
- Out of 33 evaluations only 2 had 0% coinfection

Mean of 33 field evaluations

Percent Dead & wilted	Percent of dead/wilted with INSV			Percent dead/wilted plants with INSV	Percent with INSV no wilt	Percent of total plants with INSV
	Pythium	Botrytis	Sclerotinia			
26.8	72.5	7.8	20.2	70.0	4.8	24.3

Other Varietal Evaluations

Variety	Wilt/dead Percent	INSV Symptoms Percent
Boronda	50.0	41.2
Cardinal	54.0	35.6
Momentus	9.1	35.2
Copius	3.6	10.9
Nunhems	66.7	28.1
Rijk Zwaan 1	7.6	1.1
Rijk Zwaan 2	4.6	1.8
Rijk Zwaan 3	3.6	0.9

Variety Evaluation Summary

- **The majority of fields evaluated had significant coinfection of INSV and Pythium wilt**
- **There appears to be less infection with Pythium wilt in INSV tolerant varieties**
- **Pythium tolerant varieties tested positive for Pythium wilt, but the disease only cause discoloration on the roots and was localized and did not progress further**

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