



Increasing access to local food by extending shelf life of fresh fruits and vegetables

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Fresh fruits and vegetables

- Fresh fruits per capita consumption increased 19%
- Fresh vegetables (including potatoes) 29 %



Demand of local food

Local and regional food sales in the U.S. totaled US \$6.1 billion in 2012

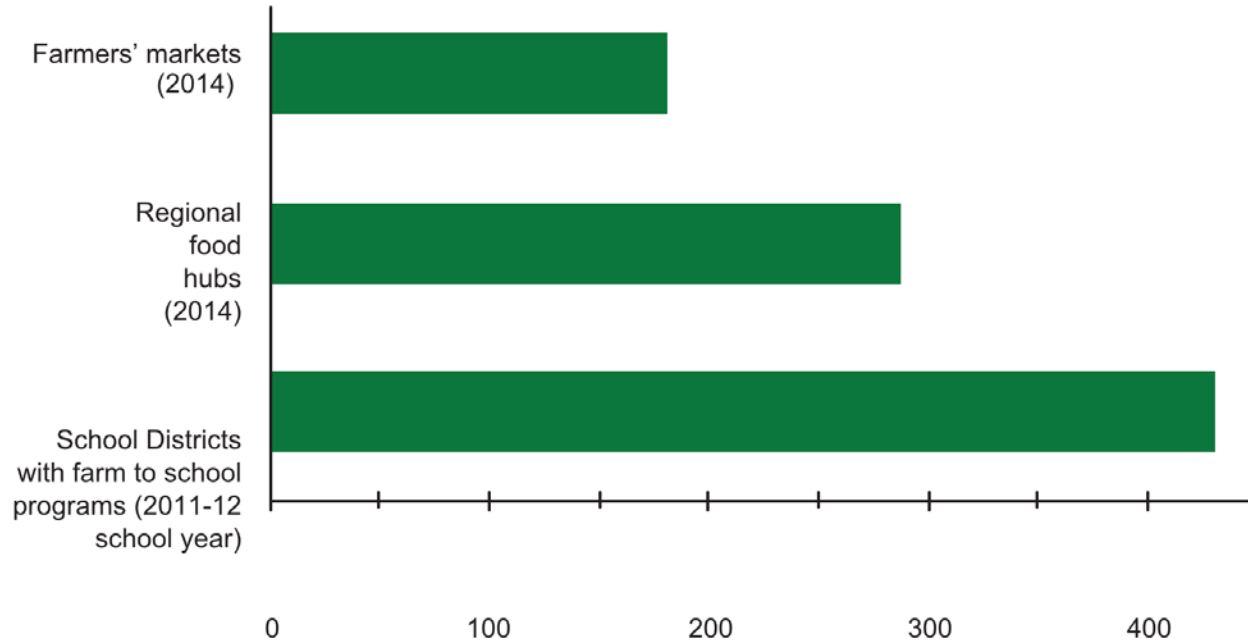
7.8% of U.S farms sold food through local food market channels



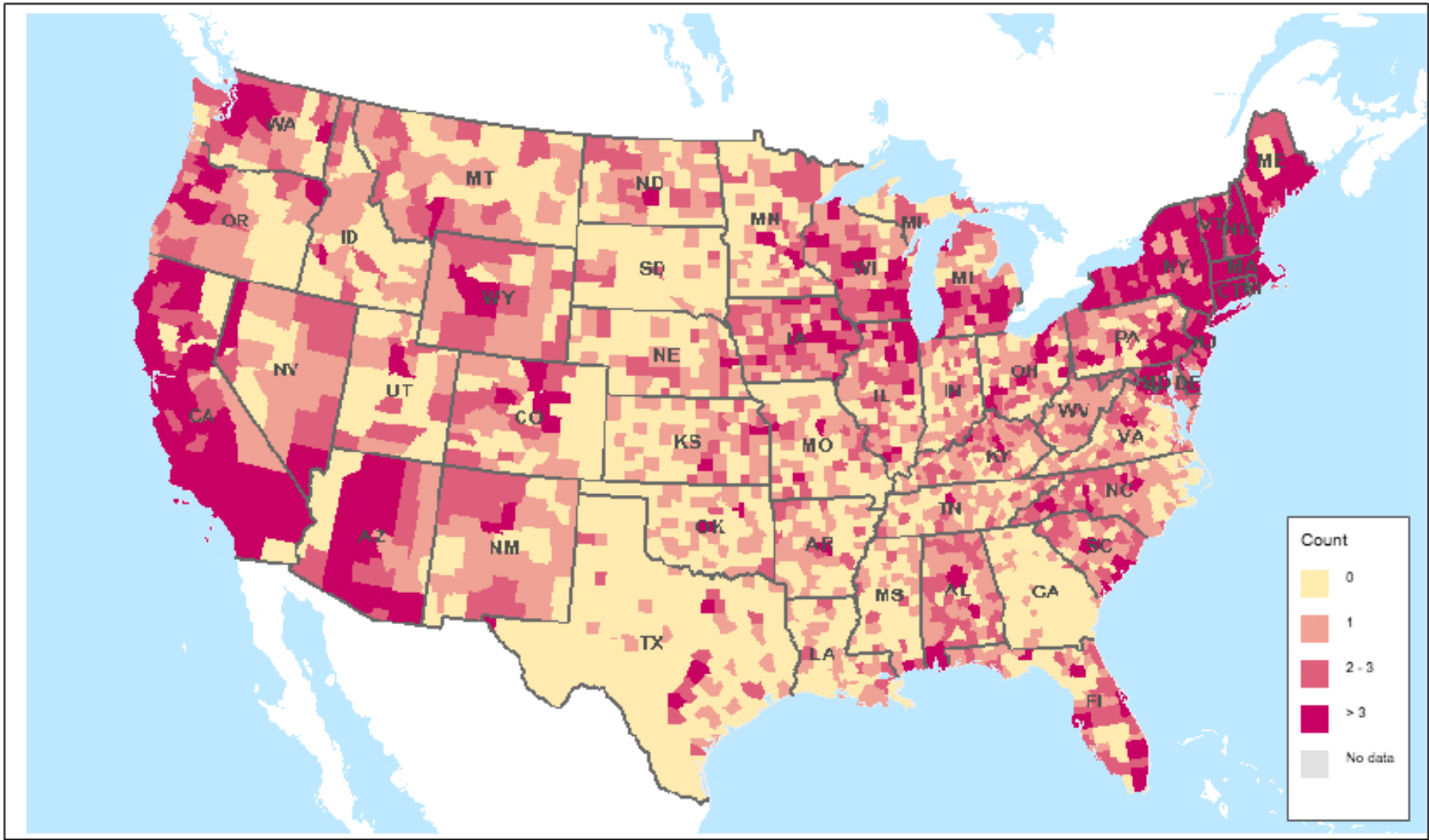
Increasing consumption of local food

Increase in local & regional marketing channels

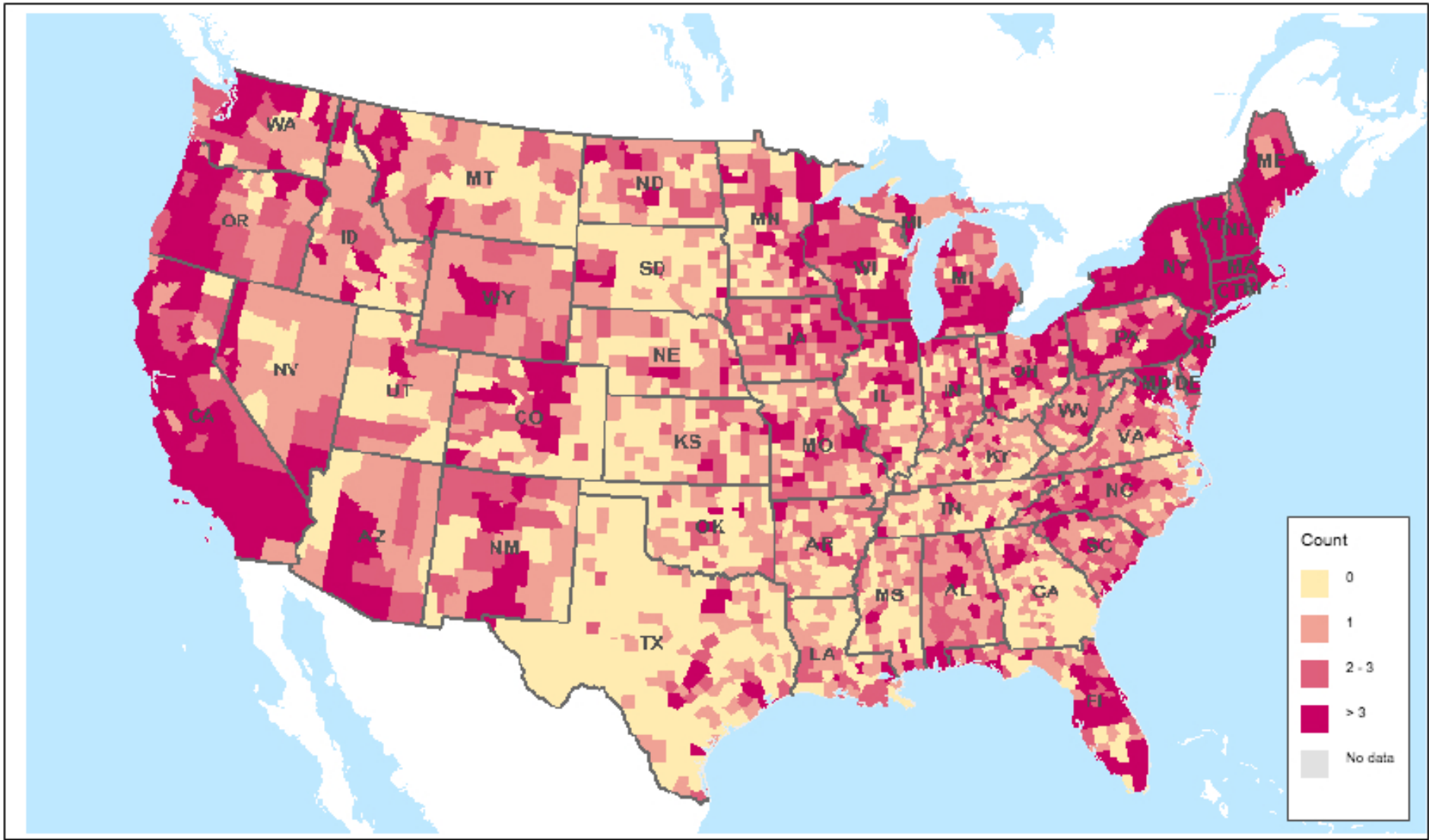
Since 2007, growth in--



Sources: USDA, Agricultural Marketing Service, Food Nutrition Service; National Farm to School Network.



Farmers' markets, 2009



Farmers' markets, 2013

Challenges for scaling up

- product volume
- quality
- consistency
- variety, or extended availability
- lack of distribution
- storage
- processing
- marketing infrastructure



Kansas Case Study

Data from the 2014 Great Plains Growers Conference, a regional growers conference held near Kansas City, indicates that:

- 70% of vegetable growers farm 1-10 acres.
- 38% have been growing for less than 5 years.
- 32% of producers have access to cooling facilities.
- 6% have access to refrigerated trucks.

Postharvest Physical Treatments to Reduce Losses of Organic and Locally-Grown Produce While Improving Quality and Extending Shelf Life



Overall objective: **reduce decay** of **locally** grown produce by optimizing **postharvest treatments**, develop **novel digital tools** for assessing crop losses on the farm, and **disseminate the result** of our work to stakeholders



United States Department of Agriculture
National Institute of Food and Agriculture



Olathe Horticulture Research and Extension Center



- 6 replicates, RCBD
- Tomatoes – 6 plants
 - 'BHN 589'
 - 'Cherokee Purple'
- Spinach – 5 x 30' rows



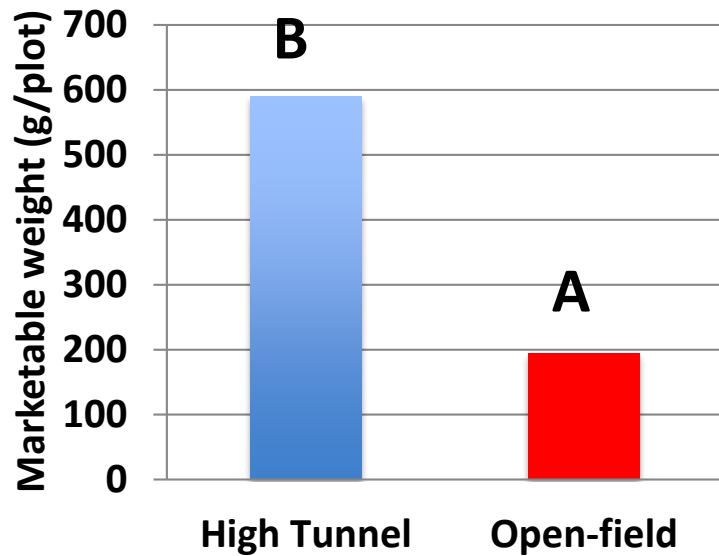
Results

AFRI Combined Tomato Fruit Yield 2014-2015

	Fruit Yield (# per plant)				Fruit Yield (lbs per plant)				% Marketability			
	Marketable		Total		Marketable		Total		Number		Weight	
Main Effects												
High Tunnel	46.4	A	58.7	A	20.9	A	26.1	A	77.1 %	A	77.2%	A
Open Field	18.2	B	26.9	B	8.9	B	12.0	B	60.5 %	B	68.2%	B
Simple Effects												
High Tunnel Cherokee Purple	37.0	C	50.5	B	16.3	C	22.5	B	71.9 %	B	70.7%	B
Open Field Cherokee Purple	12.6	A	22.5	A	6.3	A	10.4	A	50.2 %	A	57.2%	A
High Tunnel BHN589	56.0	D	67.0	C	25.3	D	29.7	C	82.3 %	C	83.6%	C
Open Field BHN589	23.8	B	31.3	A	11.4	B	13.7	A	70.7 %	B	79.3%	BC

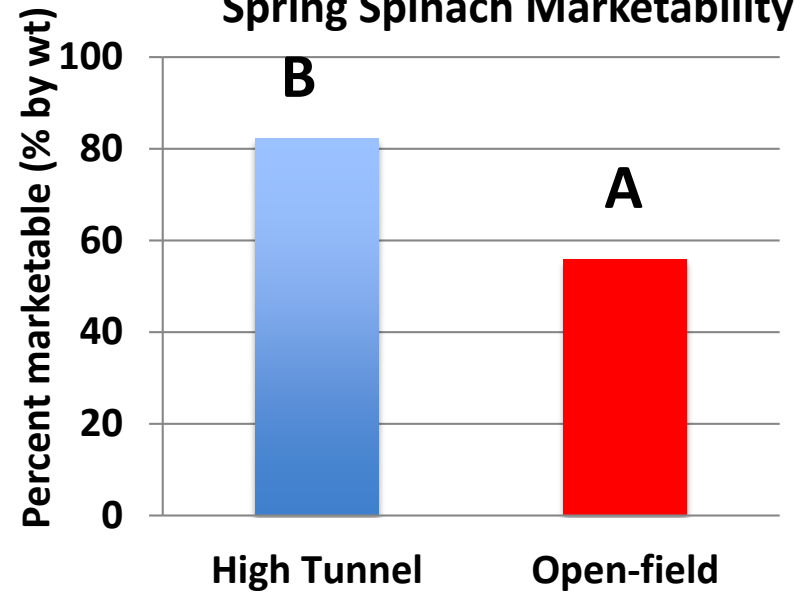
Results

2014-15 Spinach Yield



$P < 0.01$

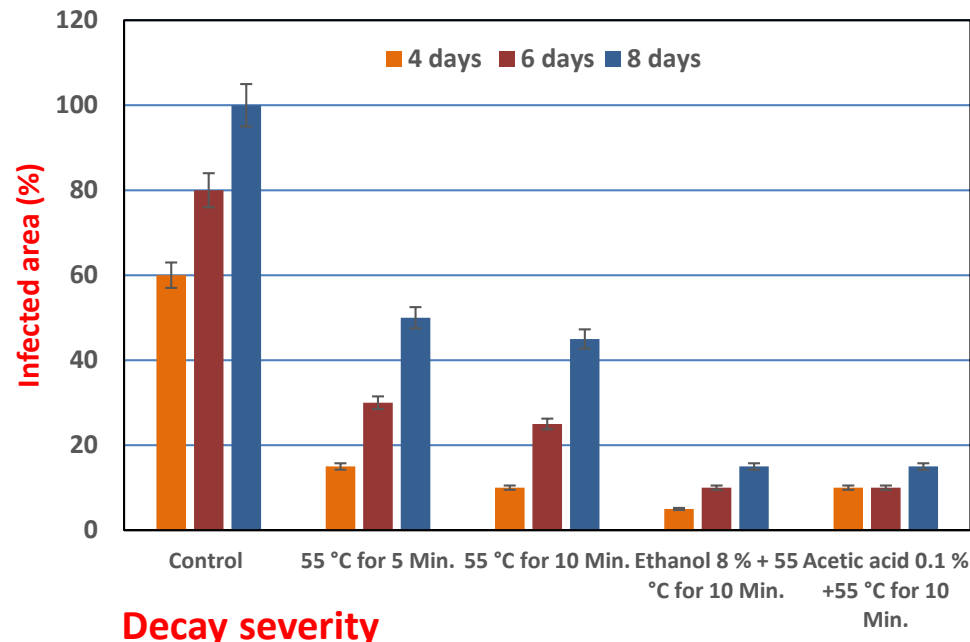
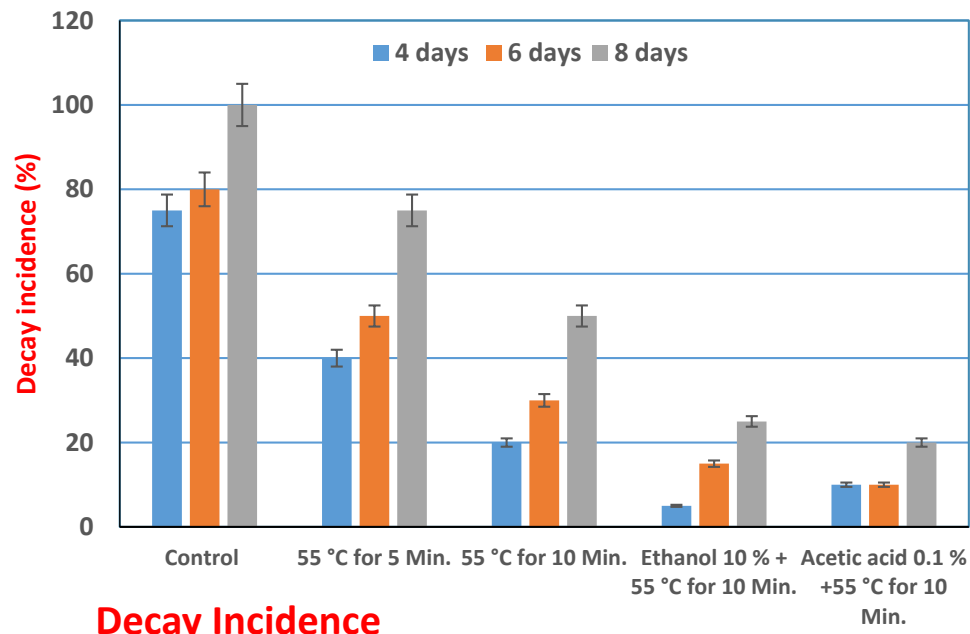
Spring Spinach Marketability



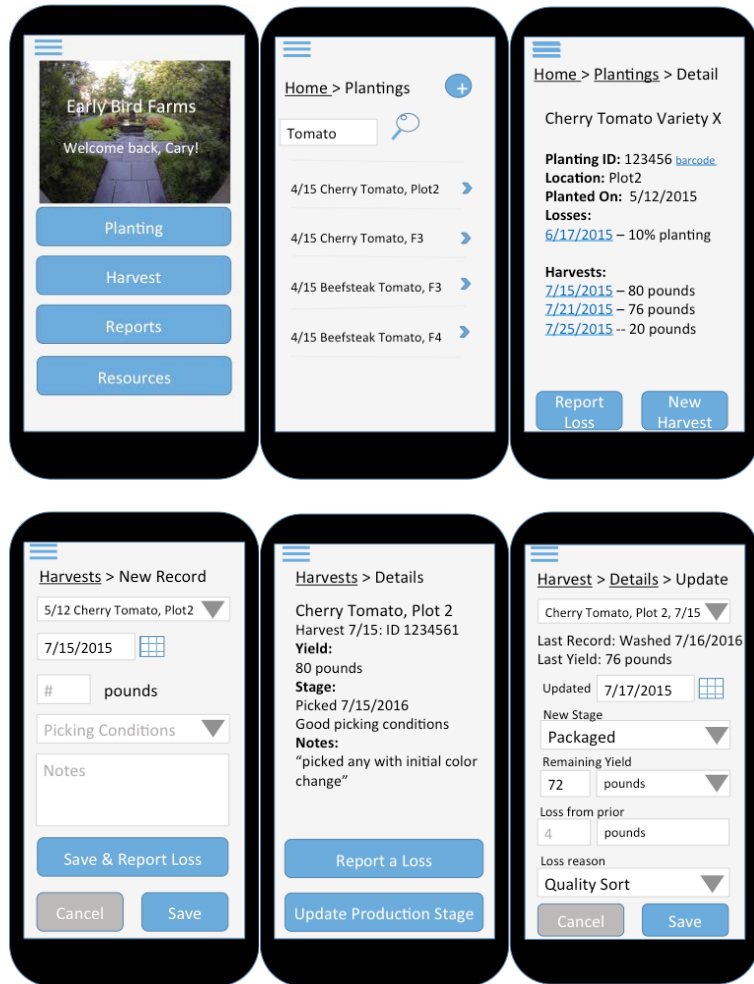
$P < 0.001$



Erwinia (*Pectobacterium*) *carotovora* (Bacterial Soft Rot)



Extension Outcomes



Improving shelf life, quality and safety of locally grown vegetables in Kansas

Overall objective: to **improve the efficiency** of storage and distribution of specialty crops in Kansas using **modified atmosphere packaging (MAP)** and **ozonated water** to increase produce shelf life, quality and safety.



Results

Table 2. Shelf life of crops stored at 13°C under different washing treatments combined or not with commercial MAP bags¹.

Treatments	Days		
	Asparagus	Broccoli	Spinach
CC	9.67 (1.53)* _{a,b}	5.67 (0.58) _a	10.25 (2.06) _a
WC	9.67 (1.53) _{a,b}	5.67 (0.58) _a	13.00 (2.45) _{a,c}
OC	10.33 (0.58) _a	5.33 (0.58) _a	12.00 (0.00) _a
CM	12.33 (1.53) _{a,b}	12.33 (2.89) _b	15.50 (1.73) _{b,c}
WM	13.00 (1.73) _{a,b}	11.67 (3.21) _b	17.50 (1.00) _b
OM	12.67 (1.15) _b	12.00 (0.00) _b	17.00 (2.00) _b

¹Average (SD) of days of storage of three separate trials, values in column followed by unlike letters are significantly different at $p \leq 0.05$

Extension Outcomes

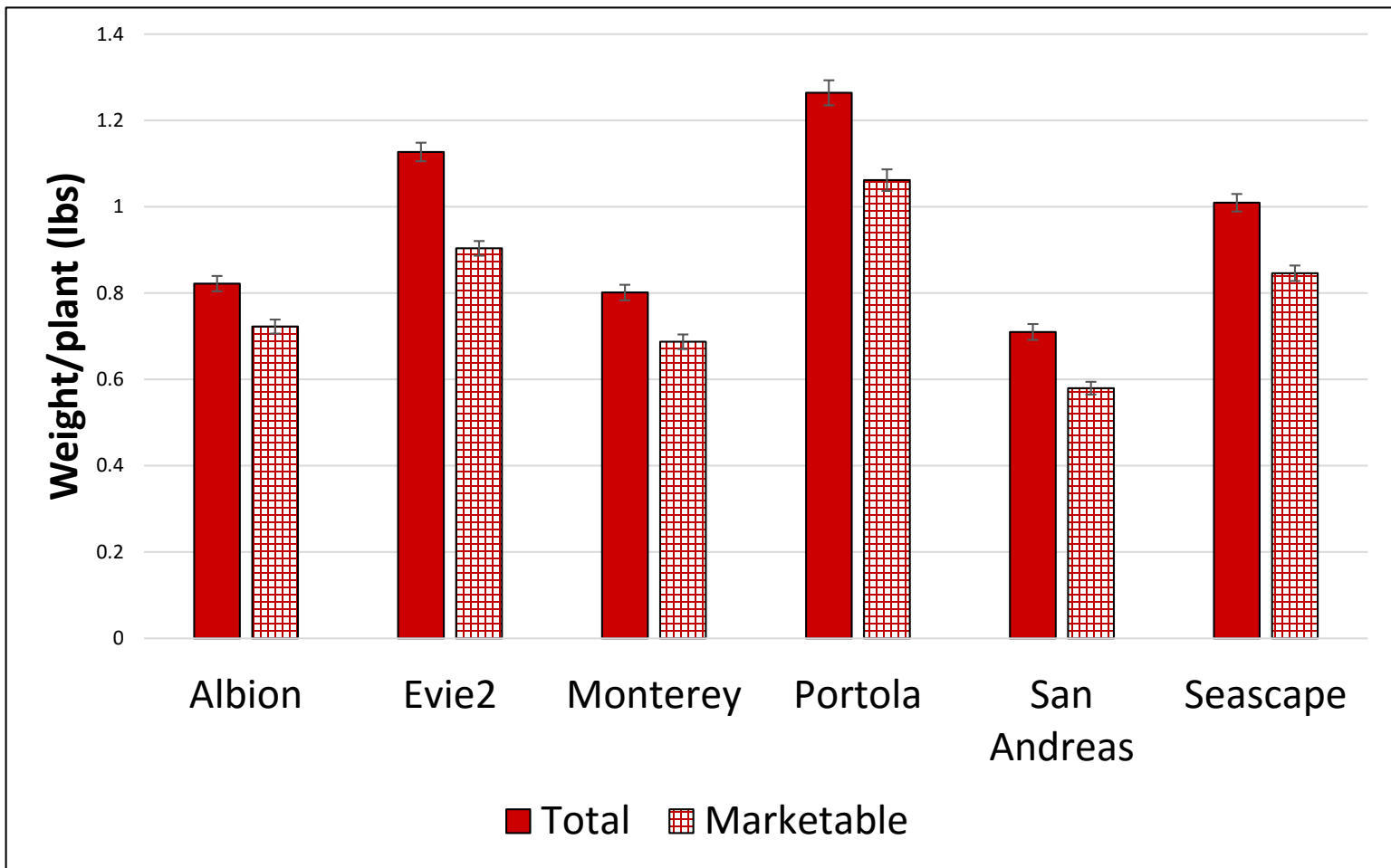


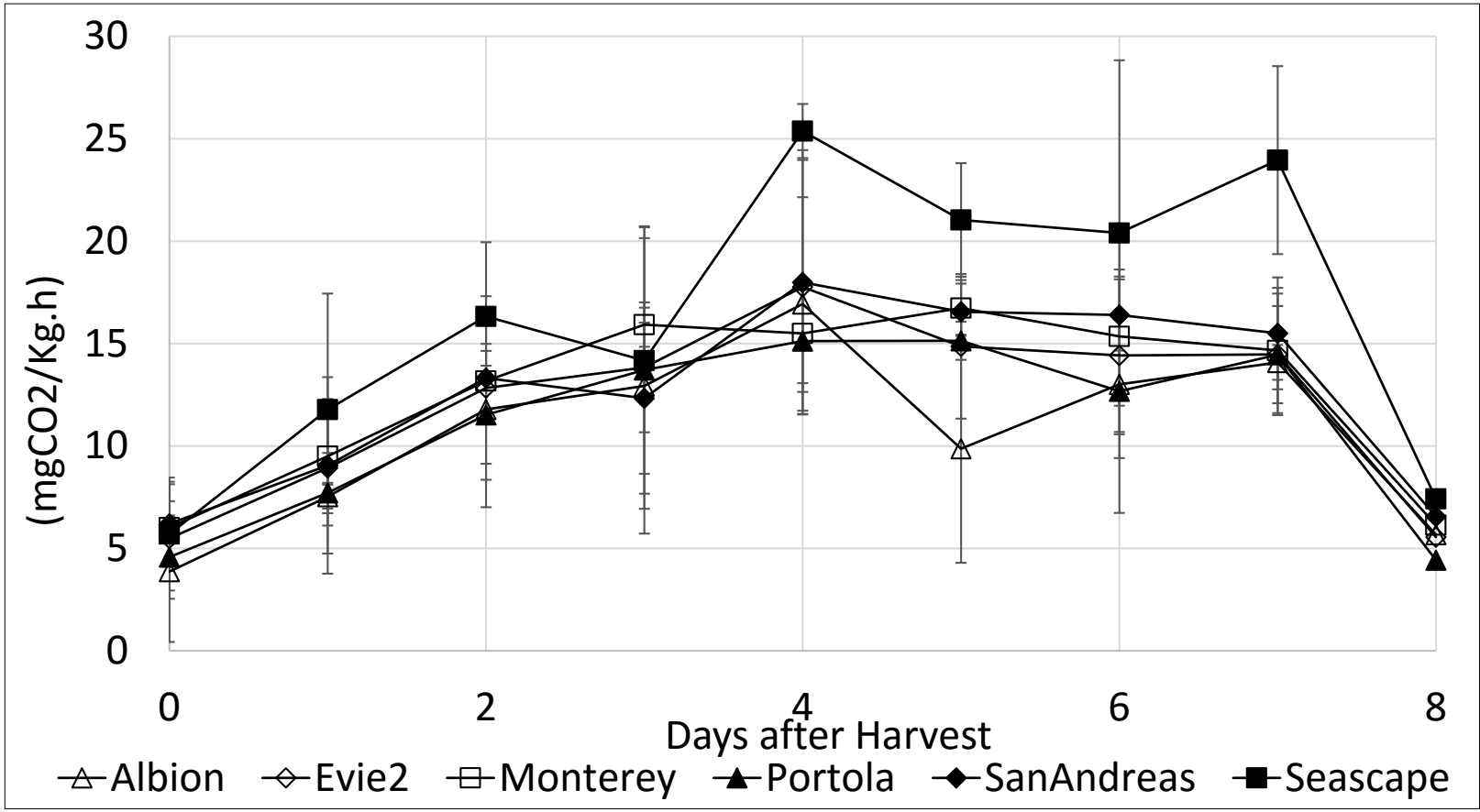
Pre-harvest Effects on Postharvest Quality of Strawberries Grown in High Tunnels



Overall objective: to determine the effect of **evaporative cooling systems** and **variety** on **postharvest quality, decay, and shelf life** of day-neutral strawberries grown in a **high tunnel**







Conclusions

- Develop practical and applicable postharvest handling for small-scale producers.
- Provide educational materials and hands-on experience.
- Identify postharvest handling needs for specialty crops that are not grown in the area.



THANK YOU FOR YOUR ATTENTION

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