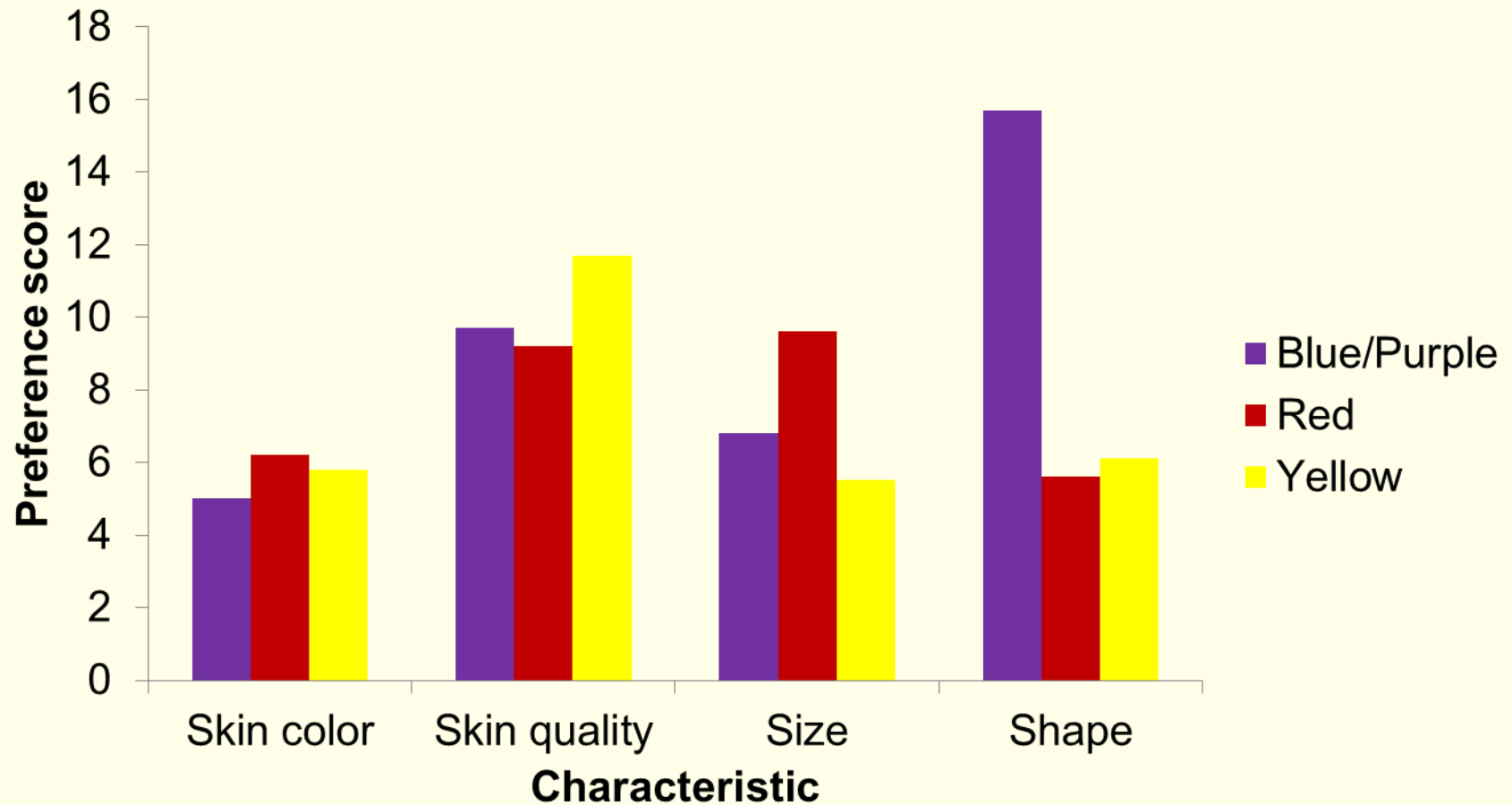


Best Management Practices for Specialty Varieties



Factors that affect consumer potato variety choices



Source: Jemison et al., 2008

Methods to improve skin color

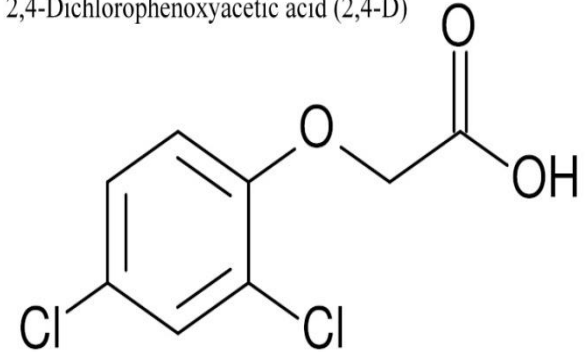
- Waxing (popular in the 1950's)
- Production regions (soils and climate)
- New varieties (ongoing)
- Growth regulators (use of 2,4-D described in 1949)



What do we know about 2,4-D?

- ✓ Auxin-like compound
- ✓ Herbicide: broadleaved weeds
- ✓ Stimulate cell growth in phloem
- ✓ Blockage \Rightarrow starvation \Rightarrow death
- ✓ Stimulate ethylene synthesis in potato*
 - Could be direct or indirect

2,4-Dichlorophenoxyacetic acid (2,4-D)



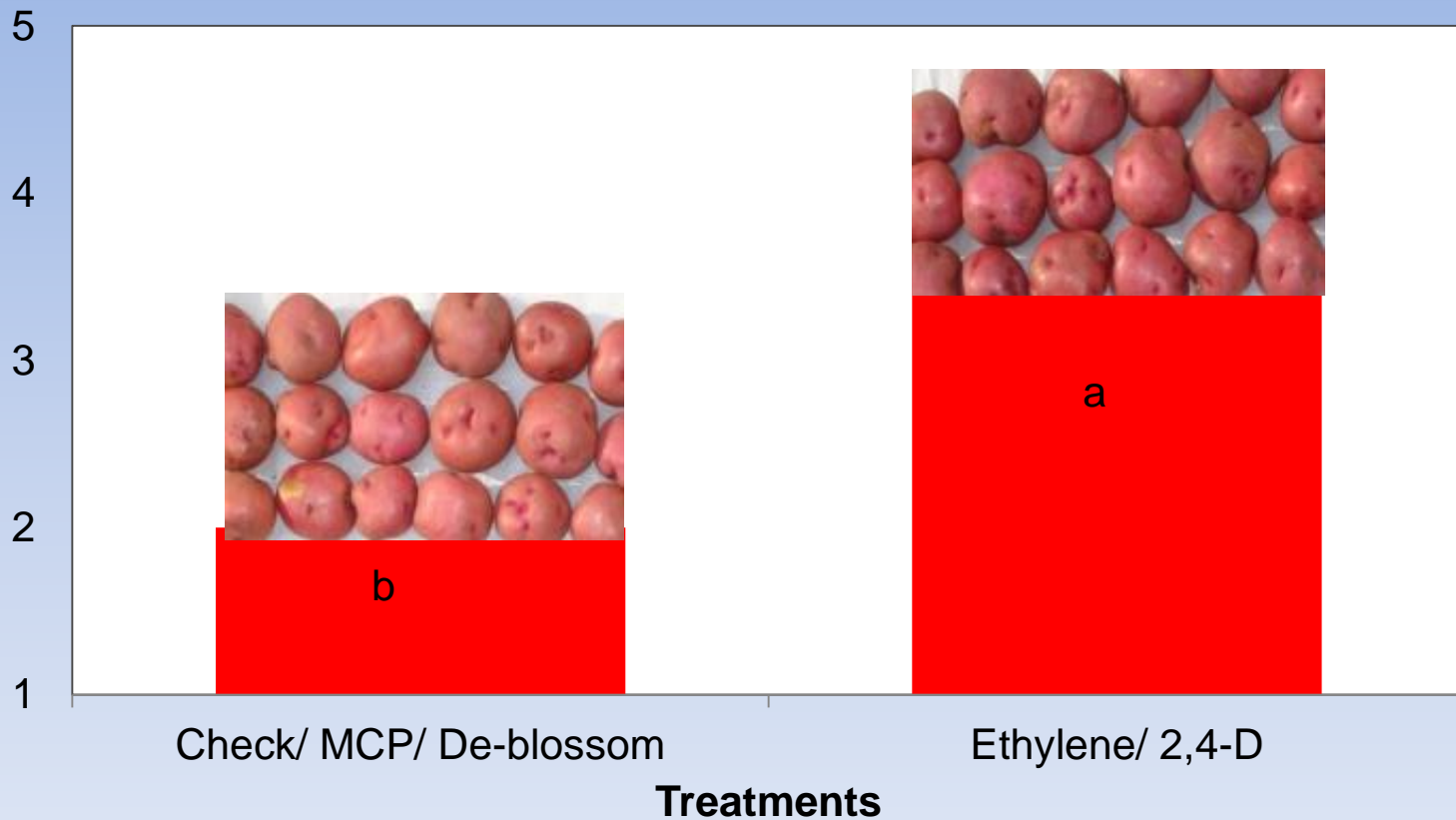
Mechanism of color enhancement

“Mechanism of 2,4-D enhancement of red color in potato periderm is not known.” (Rosen, et. al, 2004)*

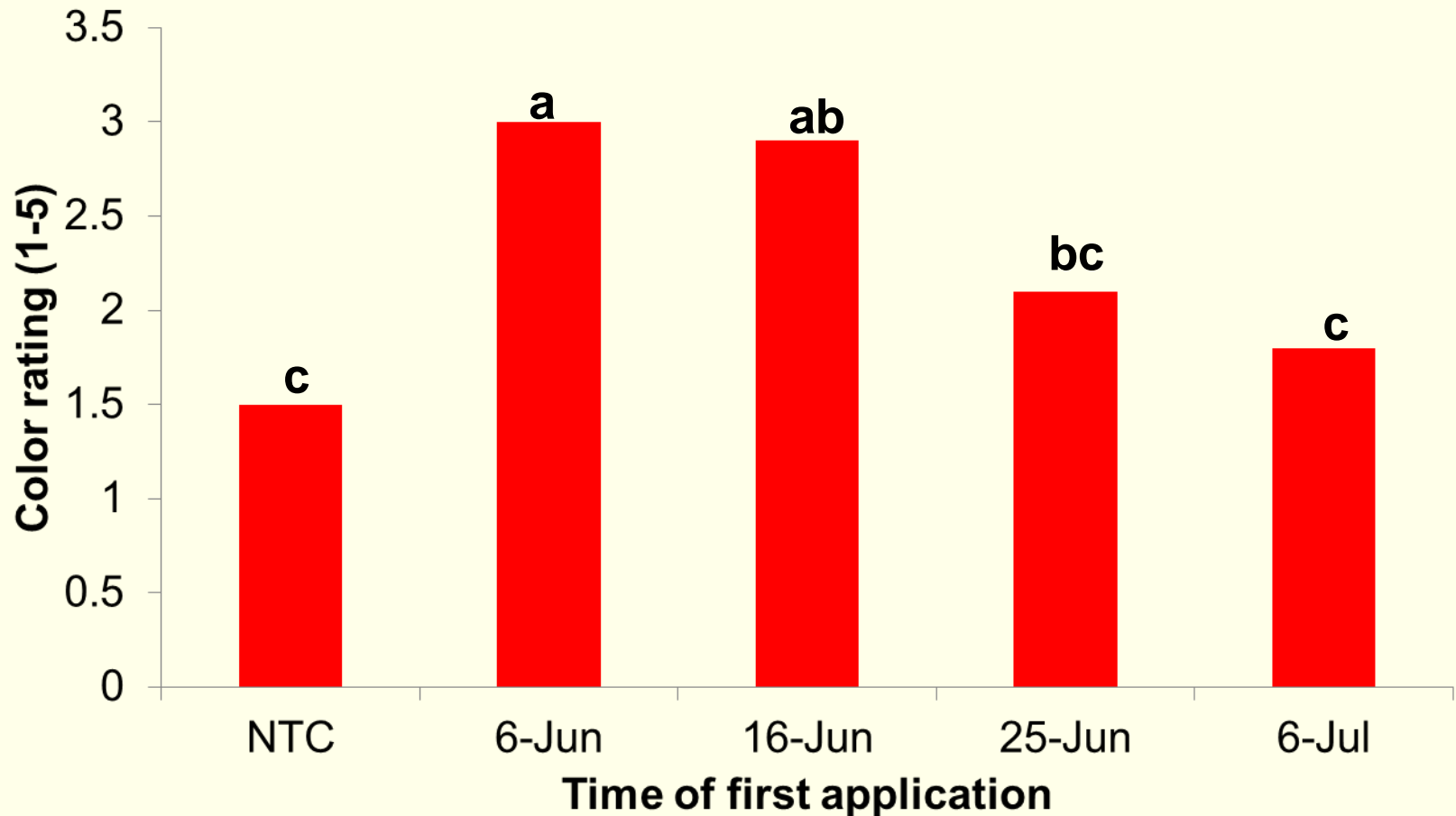


* Am. J. Pot. Res. (2009) 86:15-

2,4-D and ethephon have similar impacts on skin color, indicating a common mode of action.



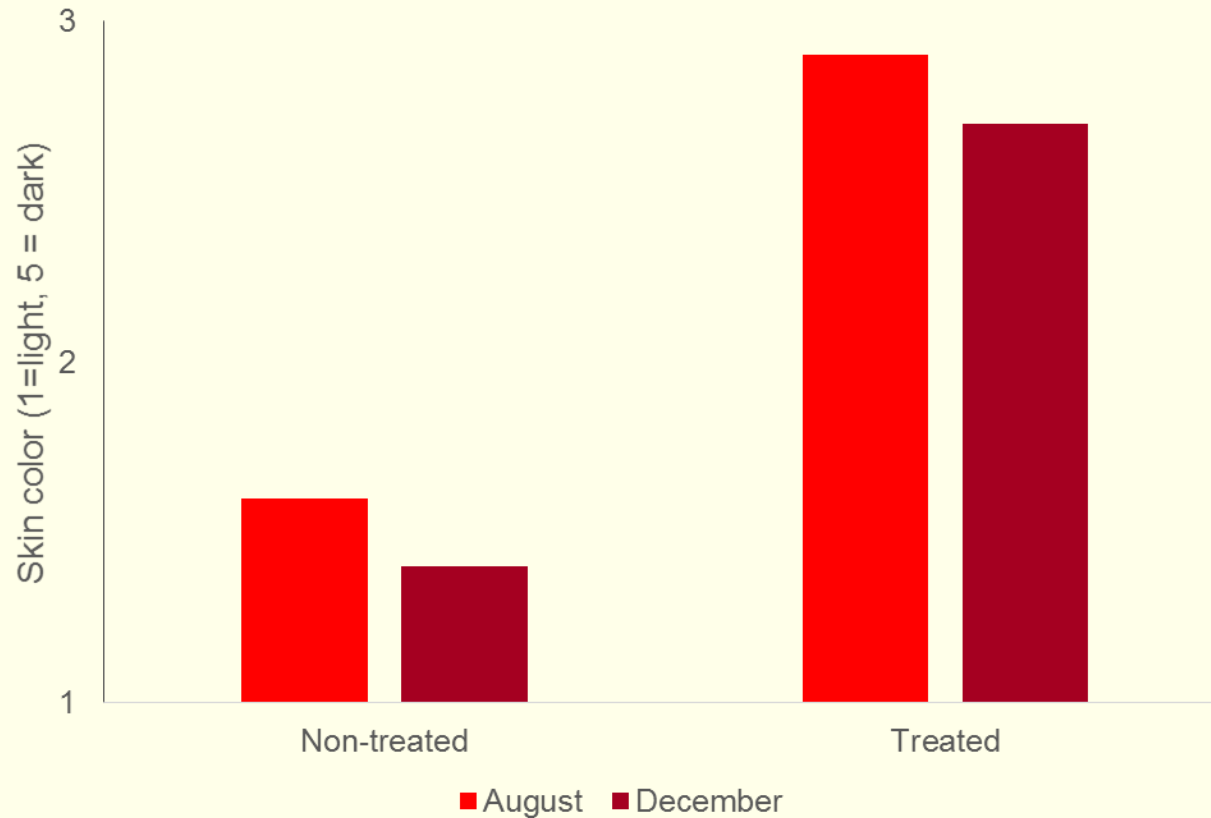
The timing for growth regulator application is fairly narrow (~10 days), corresponding with early tuber development and maximum pigment production



Maximum pigment development occurs early in tuber development, then skin color fades due to dilution as tuber size increases.



**The darker color going into storage –
the darker they come out of storage**



Growth regulators work best on lighter skinned cultivars. Skin color changes are not visible on dark red, blue or yellow cultivars.

Red Lasoda



Purple Pelisse



Yukon Gem



Terra Rosa



All Blue



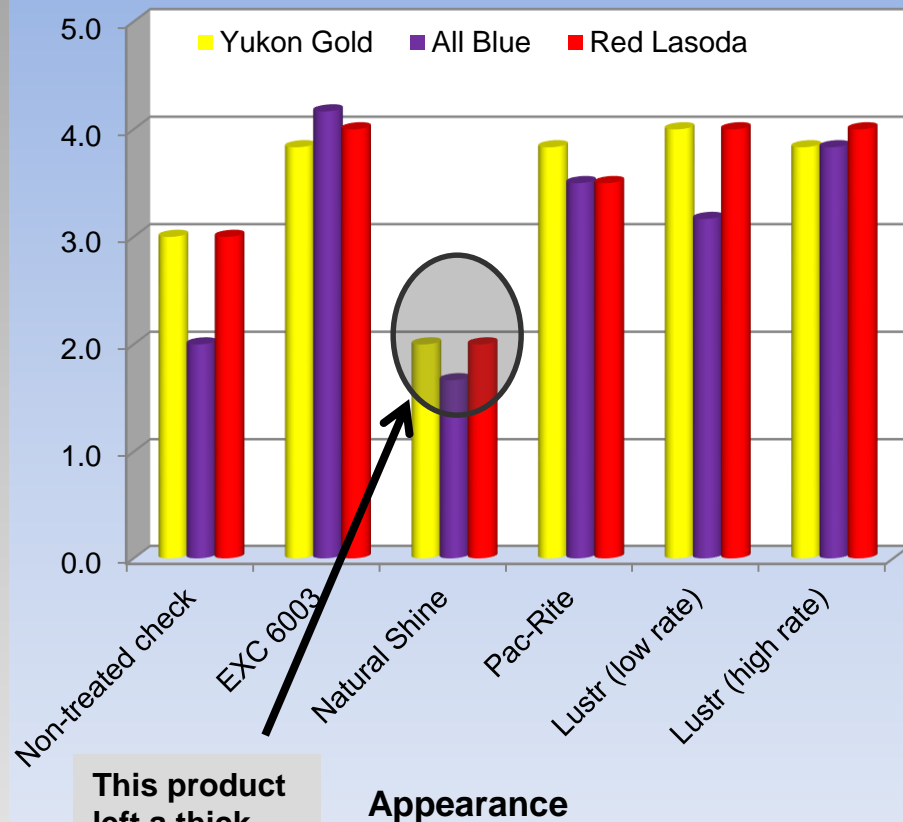
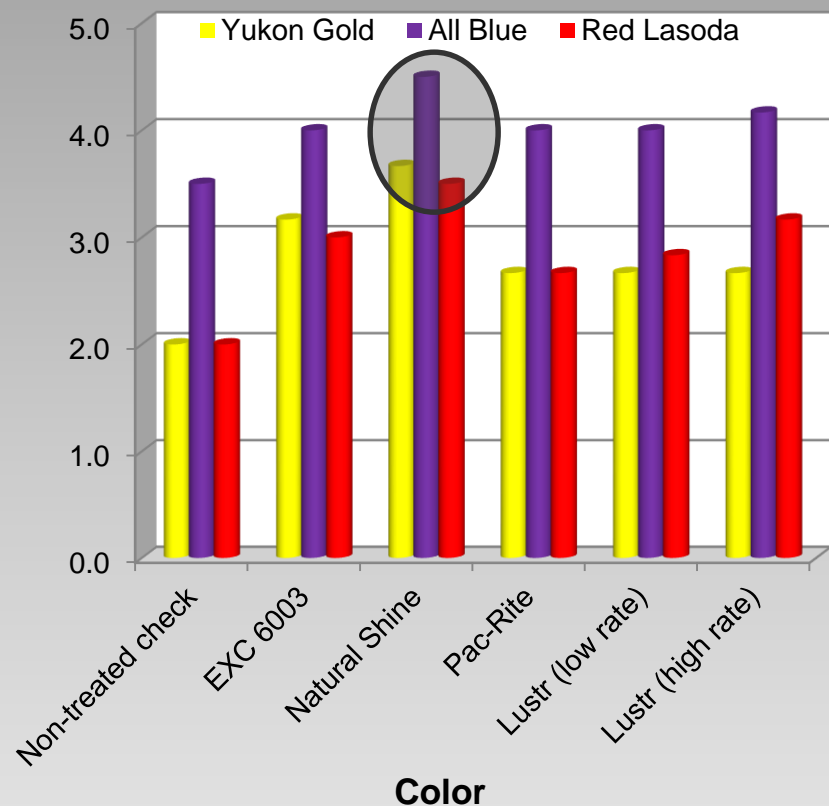
Bintje



Post-harvest practices – Storage conditions, waxes, disinfectants



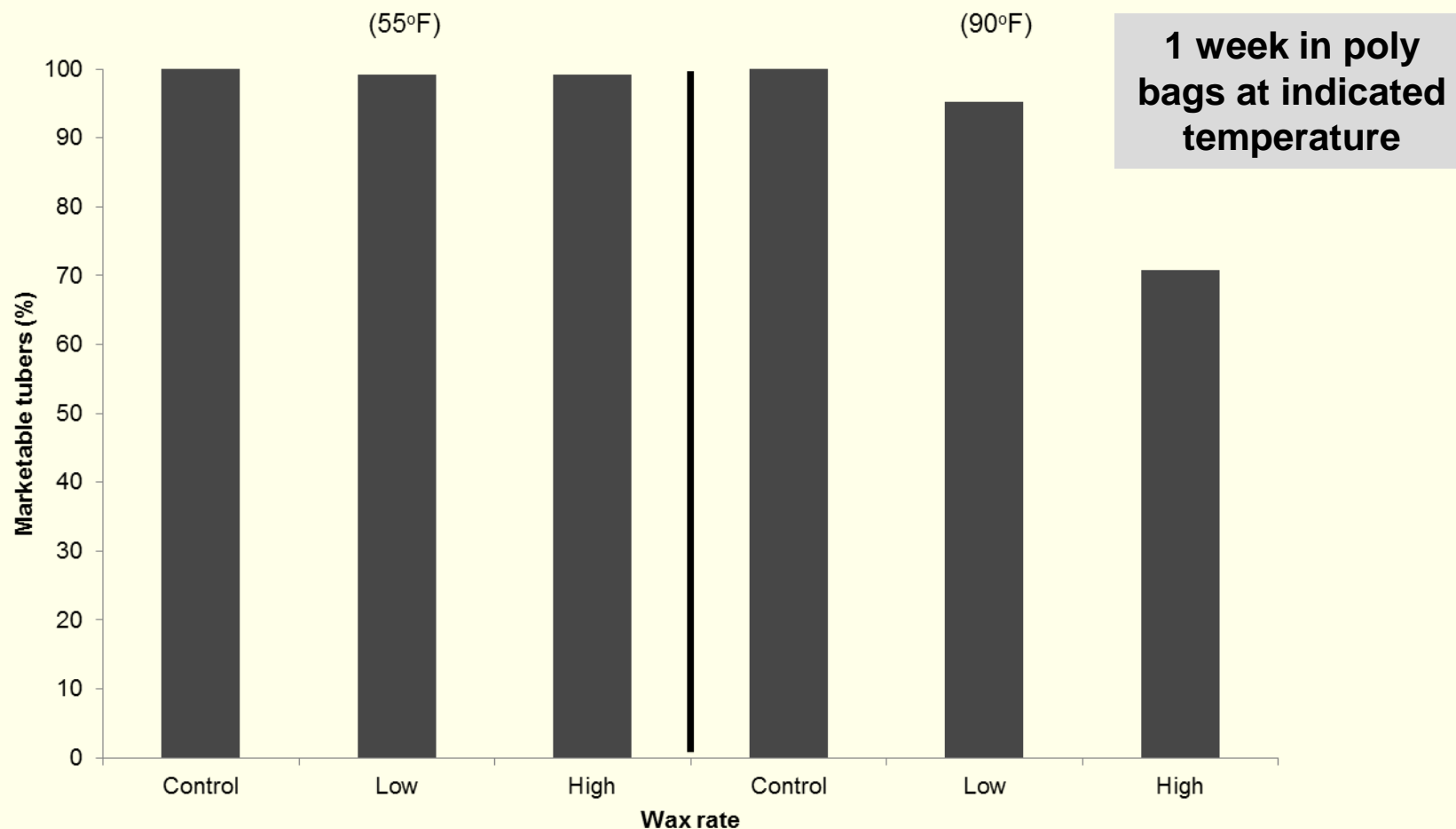
Effect of the waxing products on color (left) and appearance (right) of the cultivar All Blue. Color rated 1-5(darkest) and appearance rated 1-5(best).



This product left a thick waxy residue that was not attractive



How does wax affect shelf life?



Tubers with high disease load may decay more rapidly under high temperatures after waxing

Influence of spray application of disinfectant treatments on skin color of All Blue tubers grown at Parma, ID during 2010.

	Pre-treatment	7 days post treatment
Treatment	Skin color (1-5=darkest)	
Control	3.0	2.8
Fit	3.0	3.0
Calcium Hypochloride	3.0	3.0
Purogene	3.0	2.7
Storox	3.0	3.0
Phos Acid	3.0	3.3

Common disinfectants used in wash water did not affect skin color

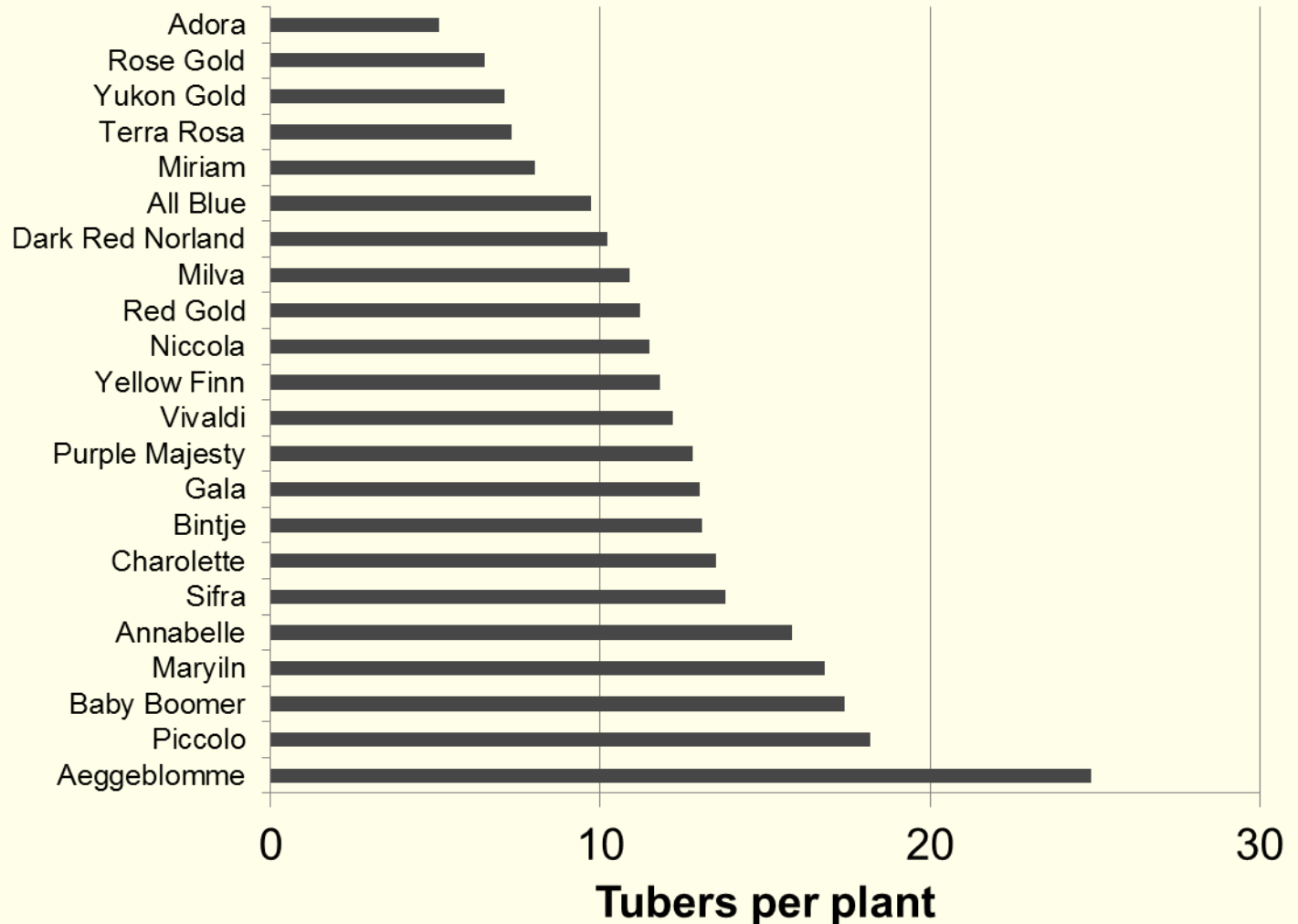


What is the best way to manage tuber size?

- **Variety (market may limit choice)**
- **Stem population (seed size, age and spacing - \$\$ and logistics)**
- **Vine kill date (need for precise timing)**

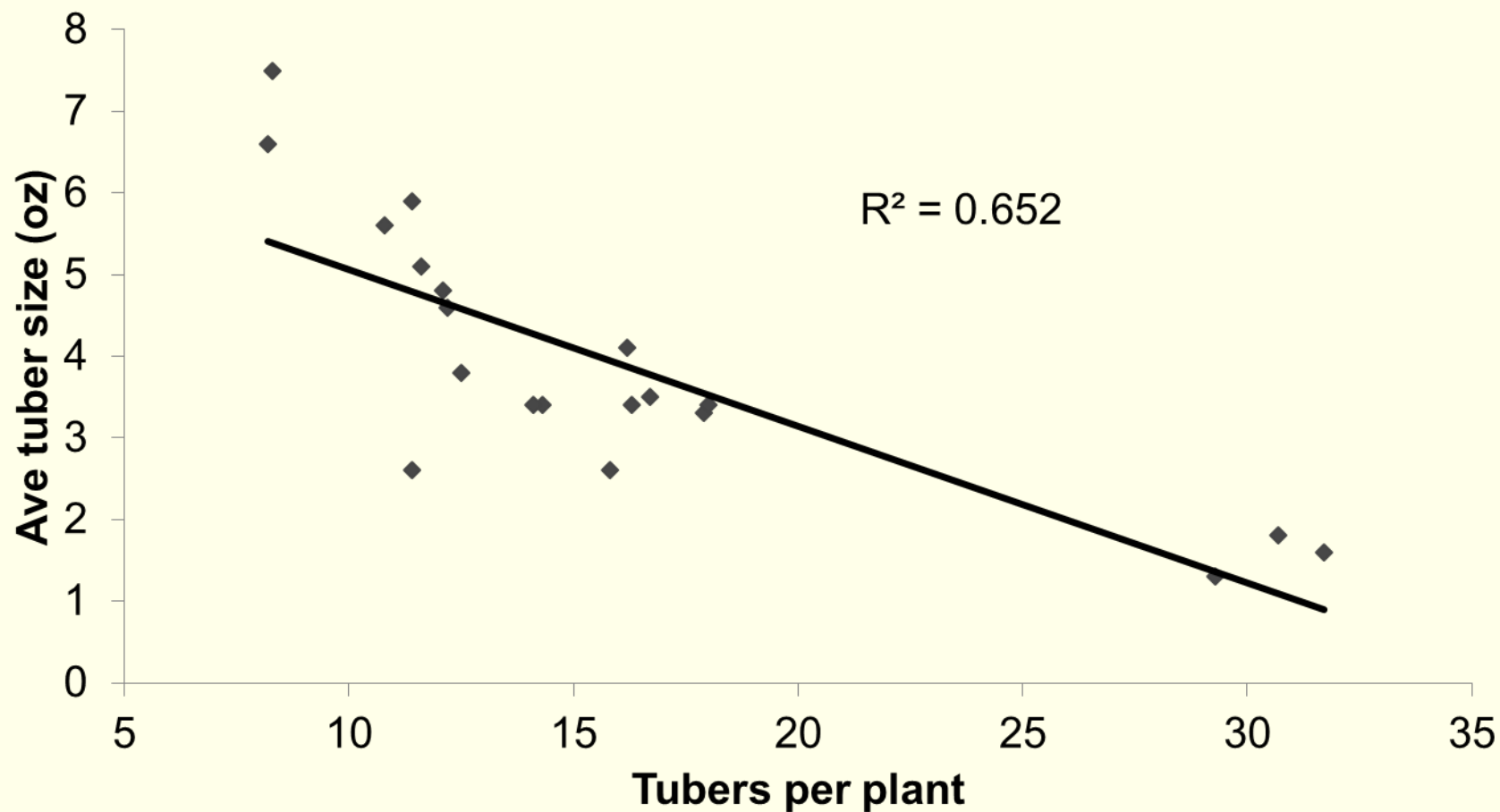


Tuber set varies greatly with variety



Source: R. Navarre, USDA

Tuber number and size are related



What determines stem population?

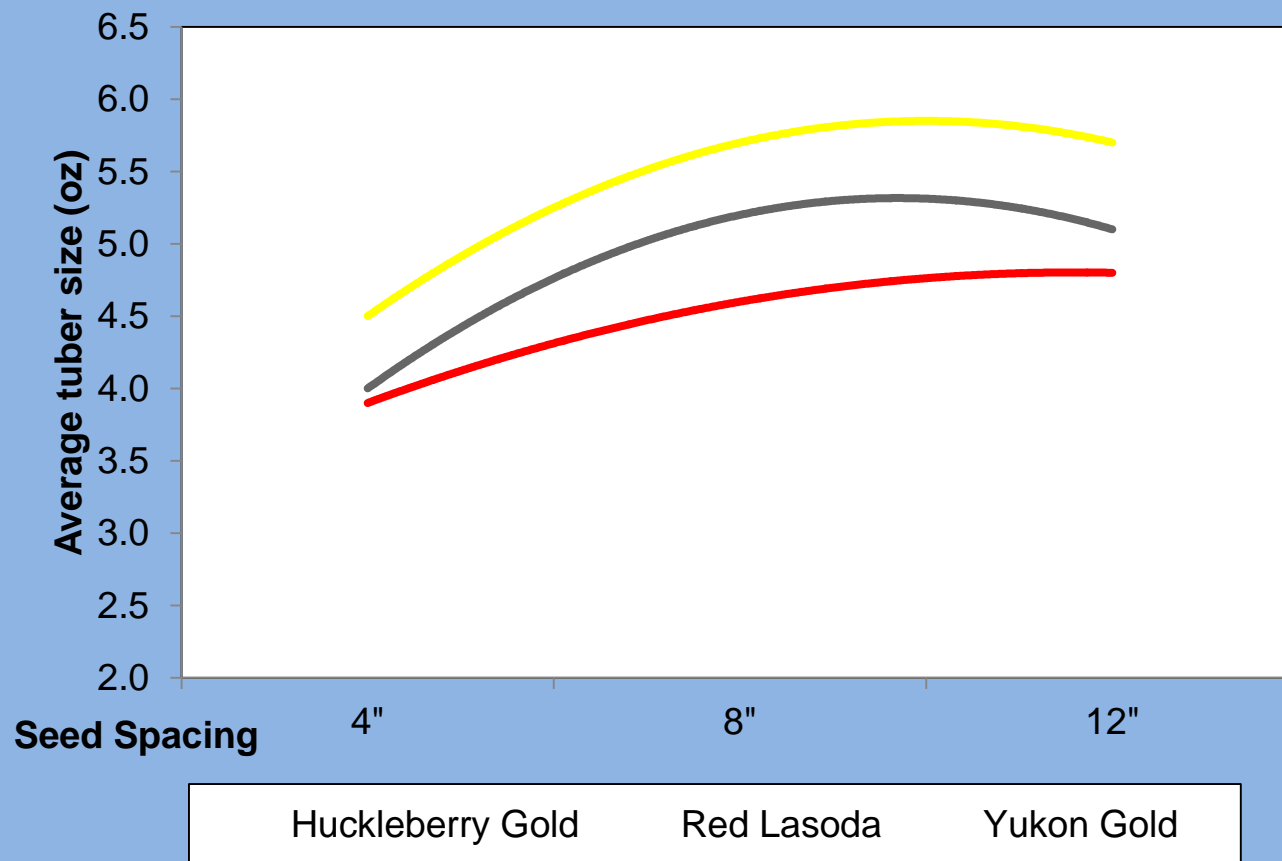
Seed condition (size and age)



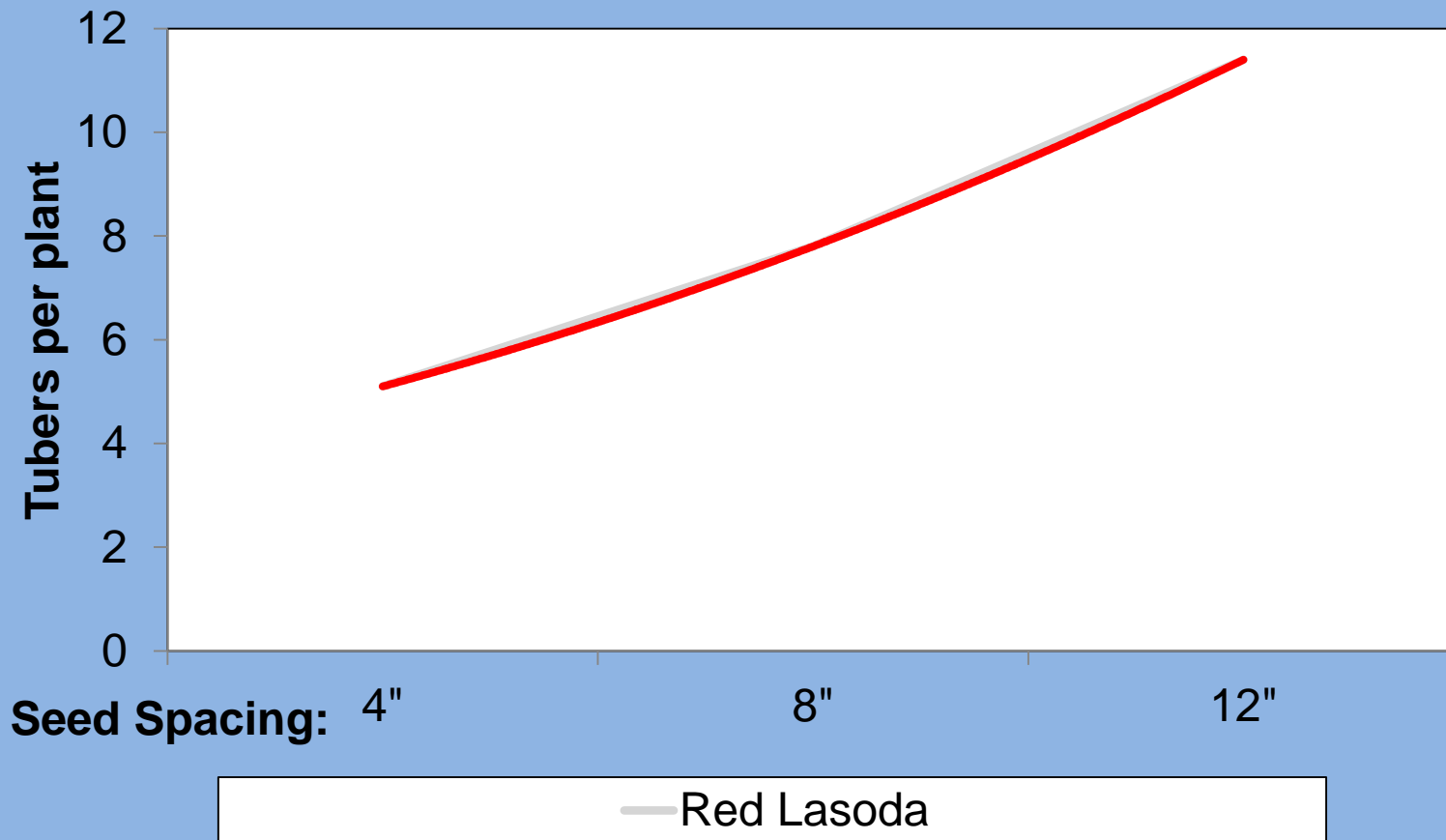
Seed spacing



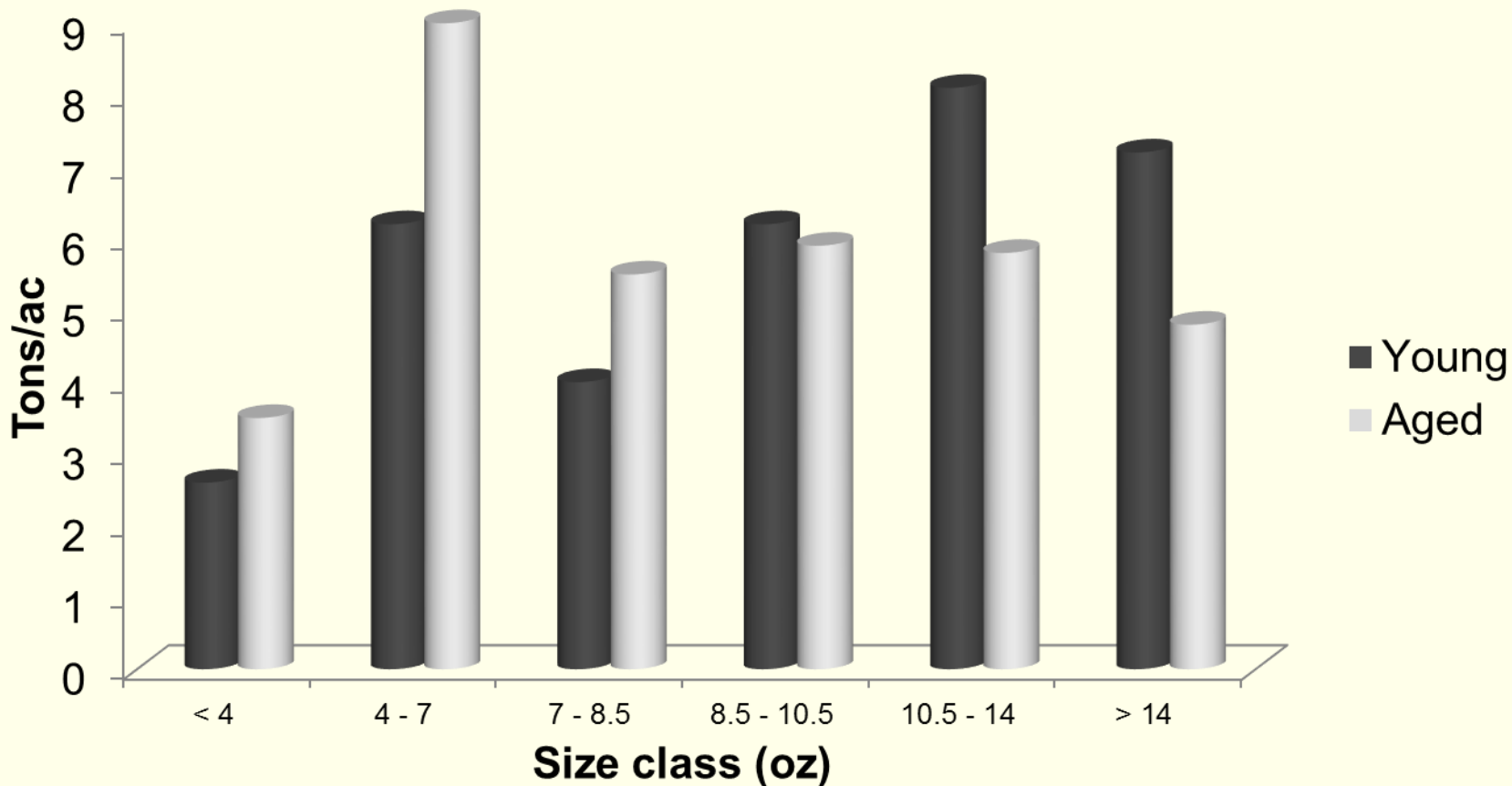
Tuber size increases with in-row spacing



However, tuber set also increases with increasing in-row spacing, so you don't get as much an advantage from close spacing you might expect.



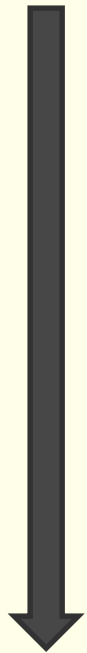
Seed aging is another way to increase stem number. Aging is most effective right after seed harvest while the tubers are still dormant.



Source: R. Knowles, WSU

Not all cultivars respond to seed aging

Most sensitive

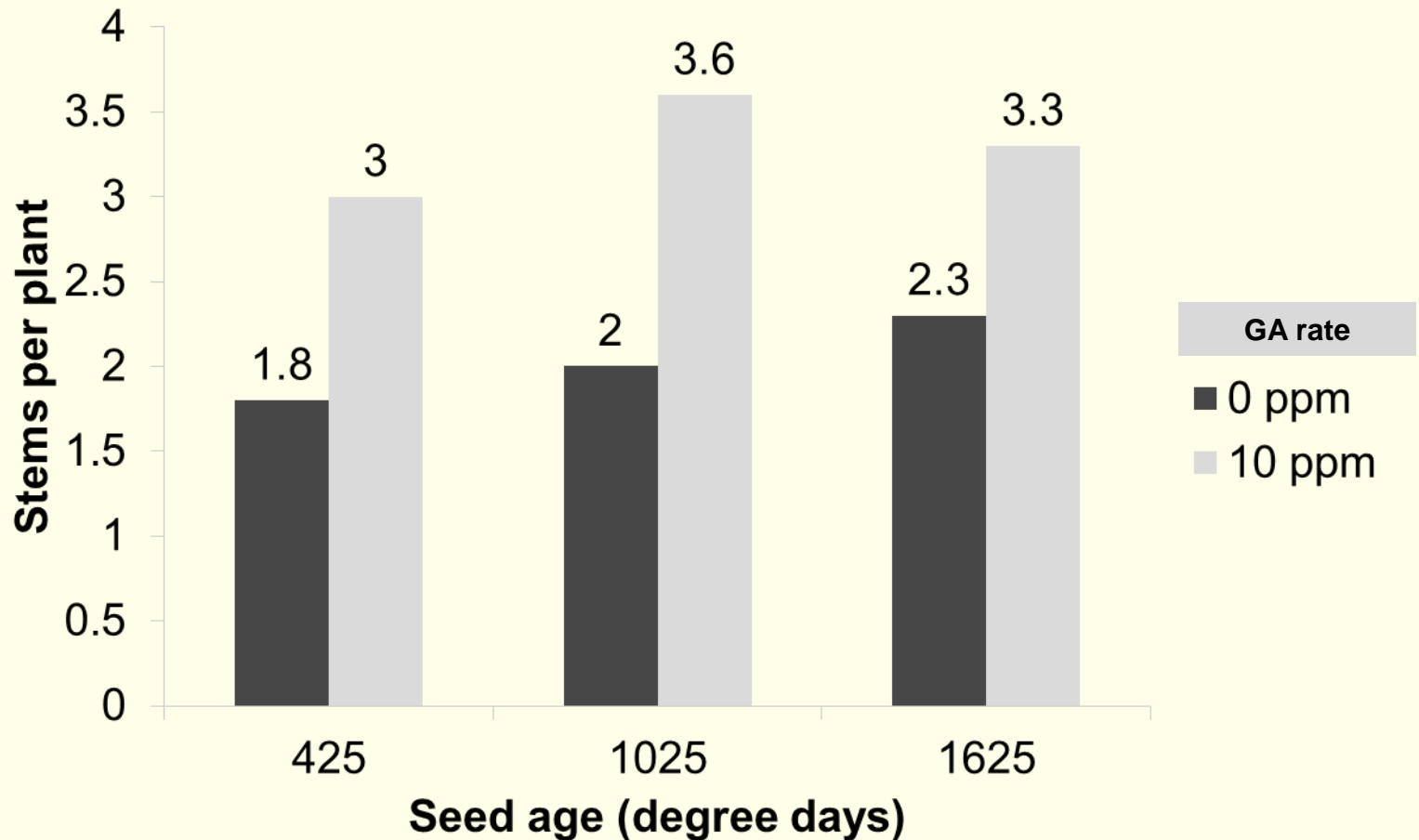


Cultivar	Age induced change
Umatilla	3.4
Russet Burbank	3.2
Satina	1.5
Shepody	0.8
Red Lasoda	0.7
Yukon Gold	0.3

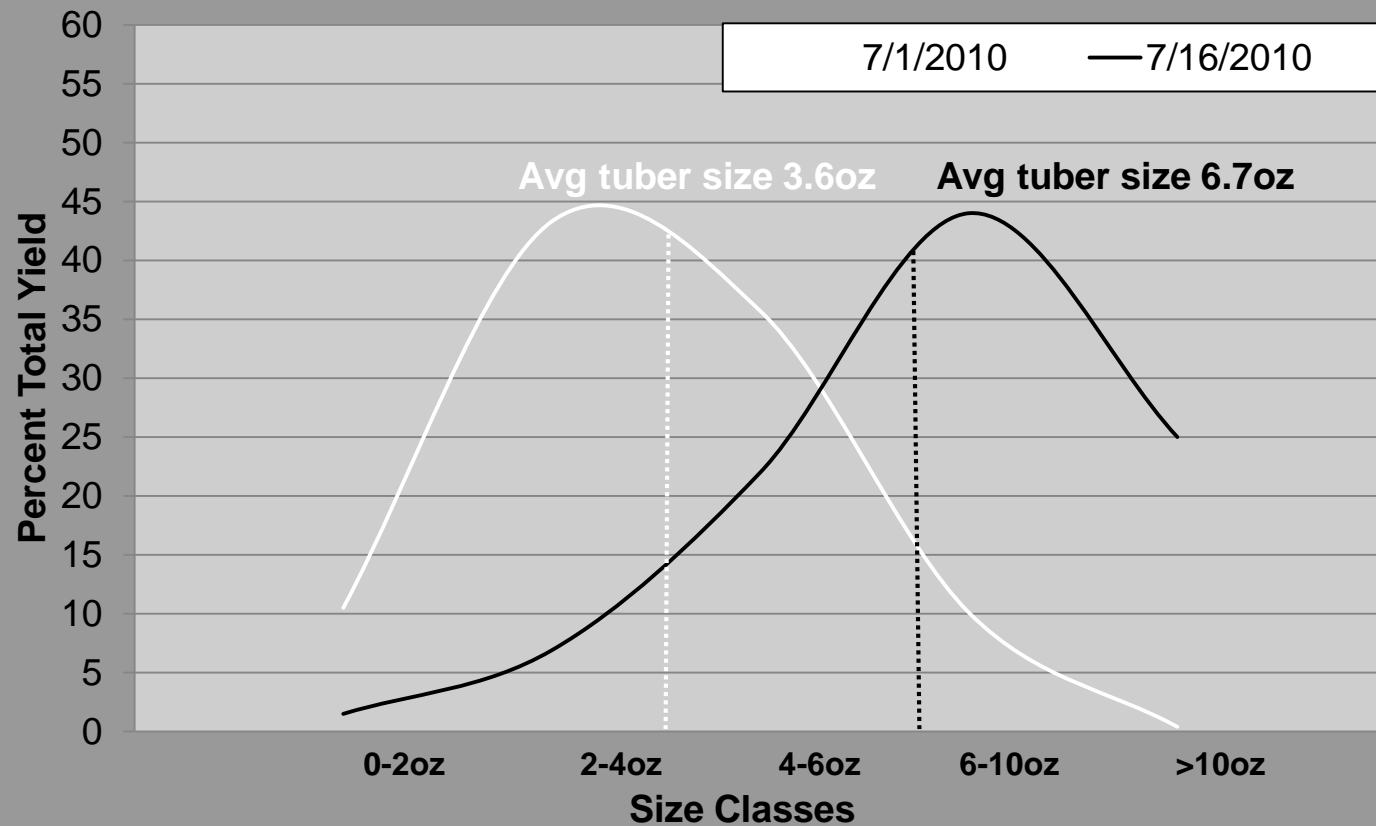
Least sensitive

Source: R. Knowles, WSU

Gibberellic acid is an alternative for cultivars that do not respond to aging



Early vine kill is another way to limit tuber size. However, size changes so rapidly that timing is critical.



Acknowledgements

