Blackspot Bruise Development

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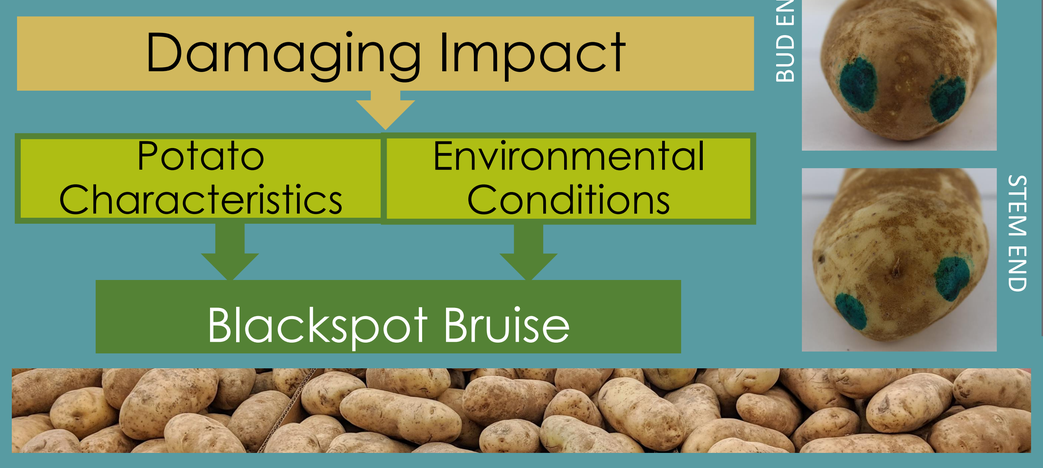
PAA The Potato Association of America

Introduction

- Blackspot bruising is a potato **quality concern** regardless of intended market
- No impact = No bruise
- Impact causes chemical reaction -> Development of blackspot bruise takes time to visually appear

Peeling potato samples can be a great tool to identify equipment or agronomic adjustments to mitigate blackspot bruise



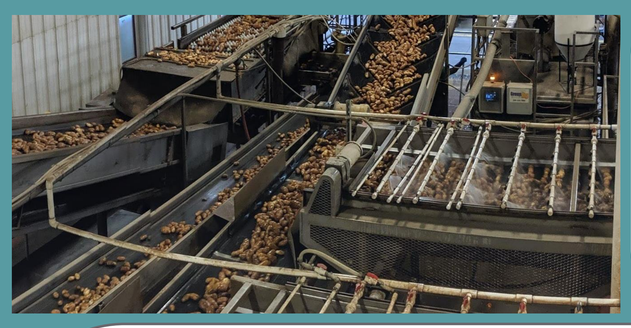
Blackspot bruises contribute to economic losses in the industry.

The objective of this study was to examine the development of blackspot bruise over a 24-hour period in Russet Burbank, Russet Norkotah, and Ranger Russet to identify blackspot bruise level (e.g. less than maximum coloration) in a shorter amount of time to provide information to make equipment or handling modifications.

Methods

- Russet Burbank, Russet Norkotah, and Ranger Russet
- Two storage seasons: Dec to Mar 2018 and Oct 2019
- Four uniform bruises on bud and stem end using a 100 g impact device
- Evaluated after 1, 2, 3, 4, 5 and 24 hours at 70F (room temperature)
- Evaluated for incidence, severity rating, and depth of blackspot bruise
- Blackspot bruise was visually rated for severity using a numbered scale (Figure 1)
  - A rating of "2" is categorized as pink

Impact Device



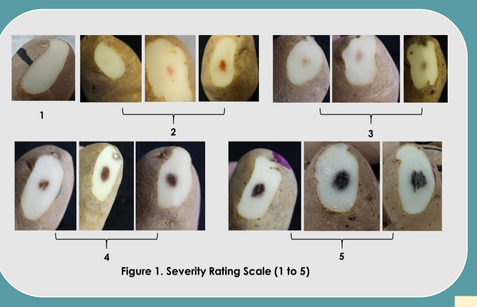
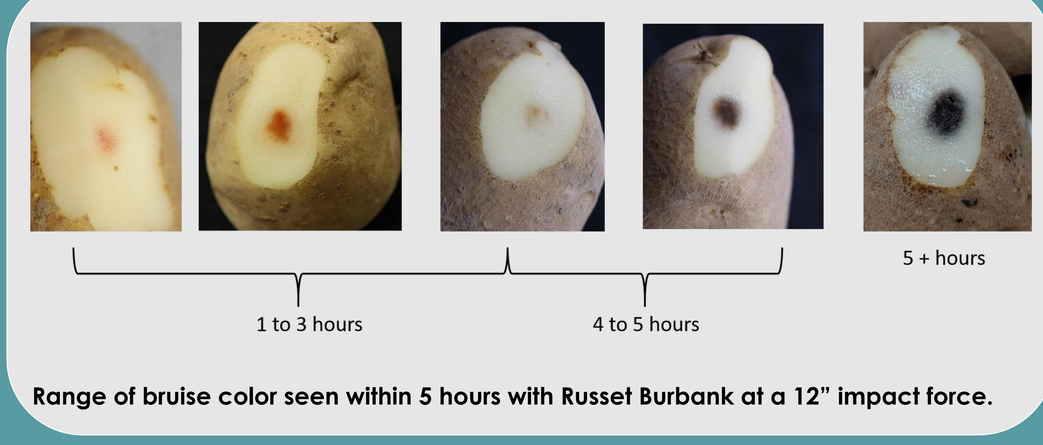


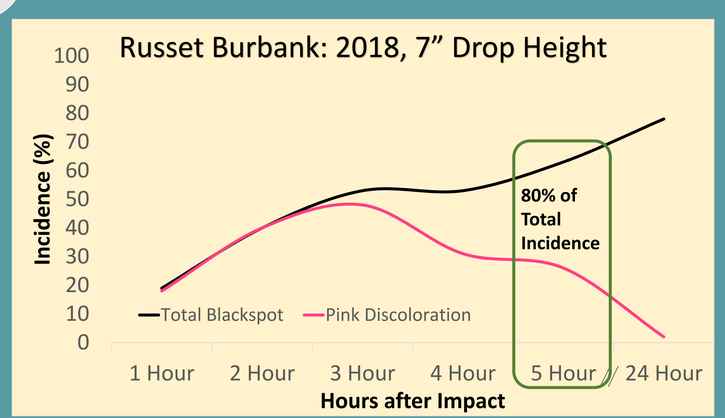
Figure 1. Severity Rating Scale (1 to 5)

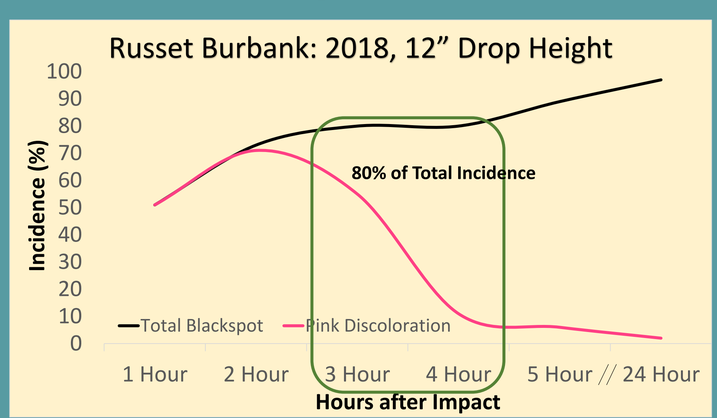
Results and Discussion

- Russet Burbank and Ranger Russet impacted at 12" resulted in 50% incidence of pink discoloration at 1 hour
- Bruise discoloration from pink to brown primarily occurred 2 to 3 hours after impact
- Blackspot bruise rating significantly increased with time after impact in all cultivars
- The severity and depth of bruise increased with time and was highest after 24 hours
- The stem end had higher blackspot bruise incidence during initial hourly development
- The highest incidence of blackspot bruise occurred at 24 hours
  - Over 80% of the total incidence was observed after 3 to 5 hours depending upon drop height and cultivar



Range of bruise color seen within 5 hours with Russet Burbank at a 12" impact force.

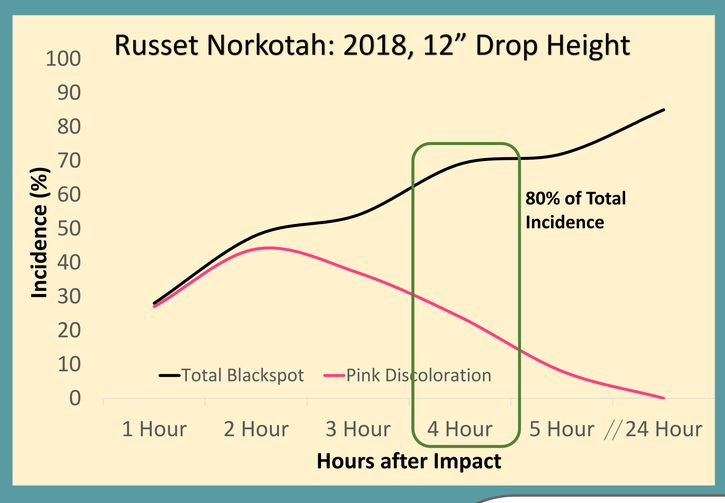


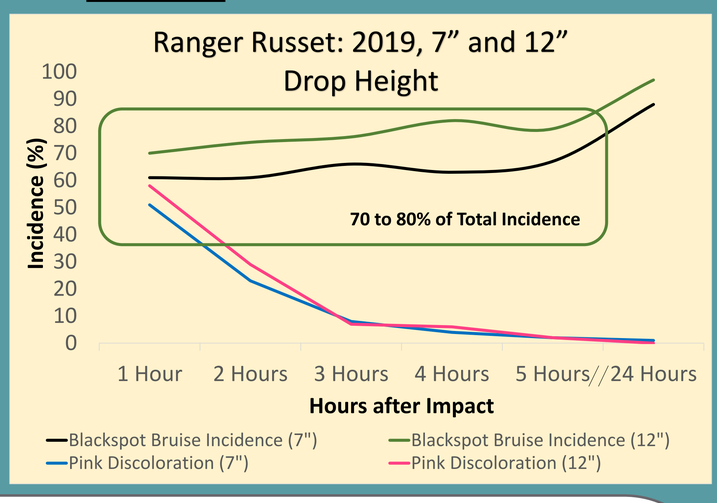


Pink Discoloration

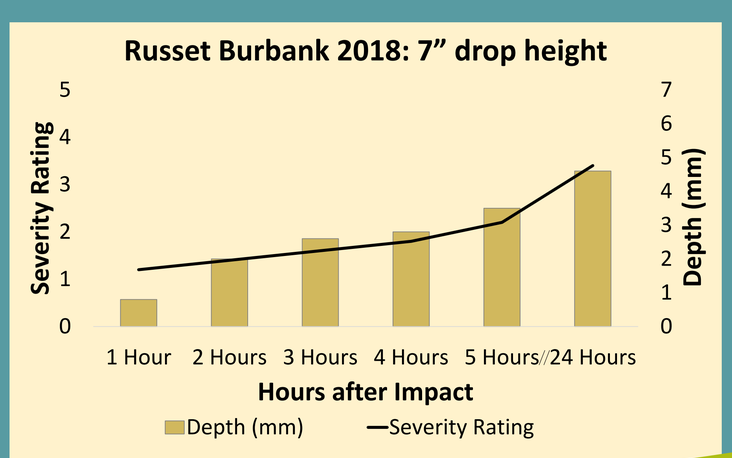
As Hours After Impact Go On…

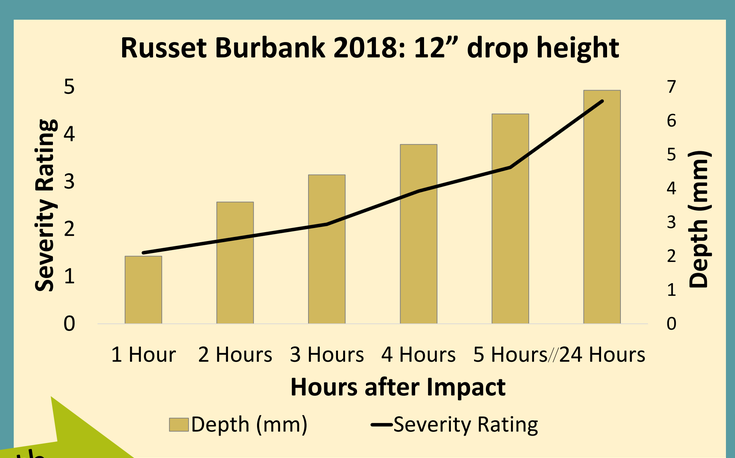
Blackspot Bruise Discoloration



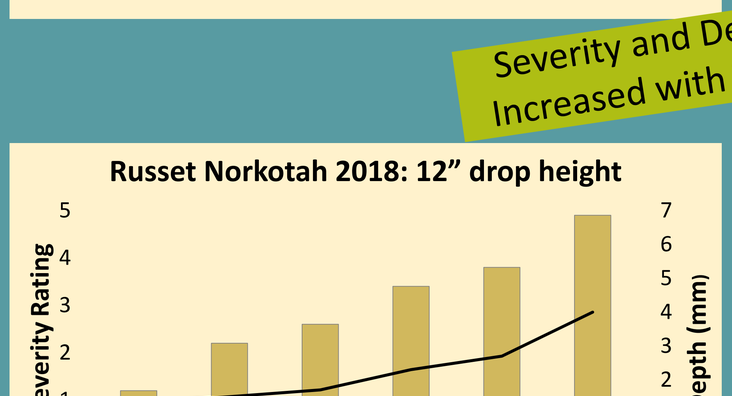


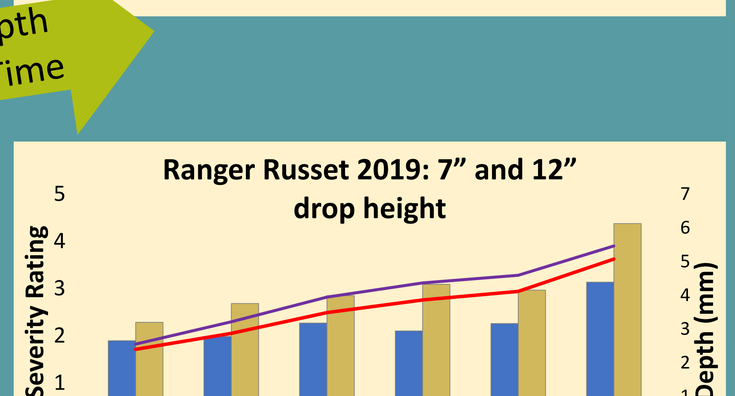
80% of the total blackspot bruise incidence was observed after 3 to 5 hours depending upon force of impact and cultivar.





Severity and Depth Increased with Time





Benefits to Industry

- The potential to use pink to brown discoloration within 2 to 5 hours after impact as an early bruise indicator
- This early evaluation does not provide maximum bruise color or incidence but can be a useful predictive tool
  - The ability to see various "shades" of a bruise is needed especially for bruises caused by lower impacts
- **Industry has the ability to quickly identify fresh bruise providing opportunity to alter management practices and reduce the risk of tuber defects**

Pink and brown colored bruises could potentially be used as an early indicator for blackspot bruise.

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