



Late season tuber development of Russet Burbank and Clearwater Russet on bruise susceptibility

University of Idaho

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Introduction

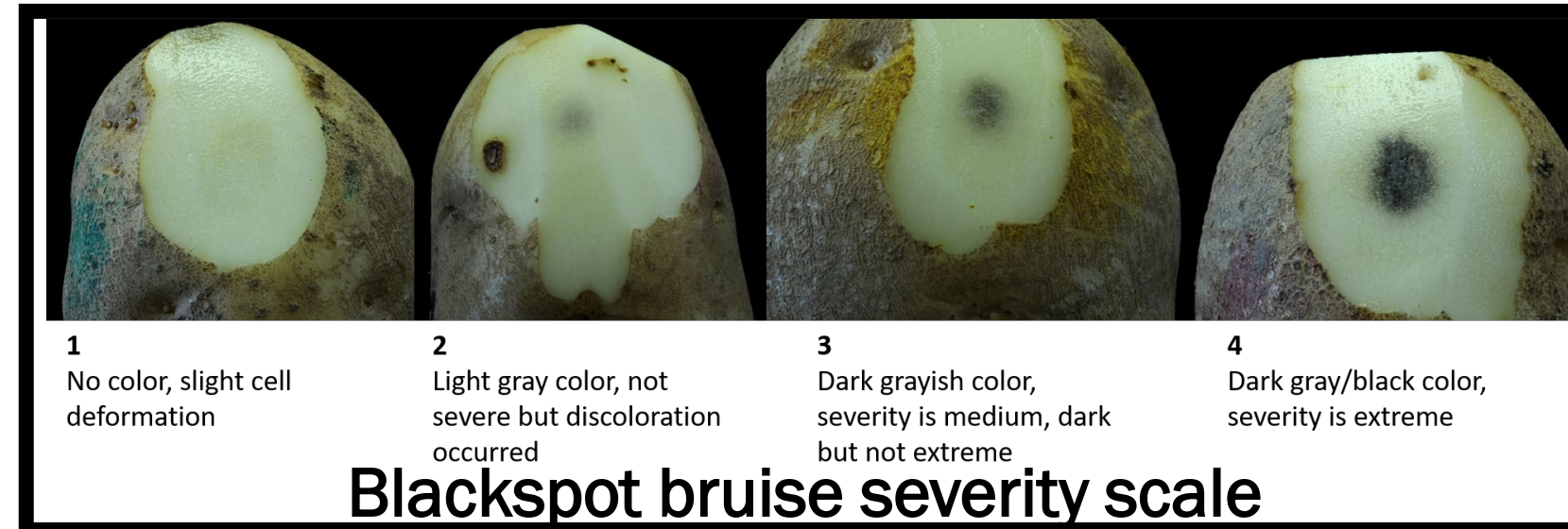
Many factors can alter a tuber's susceptibility to bruise: cultivar, tuber temperature, size and hydration, maturity, handling, and many others. Questions have arisen on the impact of late season tuber development and post-vine kill on blackspot and shatter bruise susceptibility.

Due to the greater risk for Fusarium dry rot decay in Clearwater Russet, ways to manage and minimize shatter bruise are desired. Means to reduce blackspot bruise with Russet Burbank continues to be a need in the industry.

What is the impact of late season tuber development and post vine kill on blackspot and shatter bruise susceptibility?

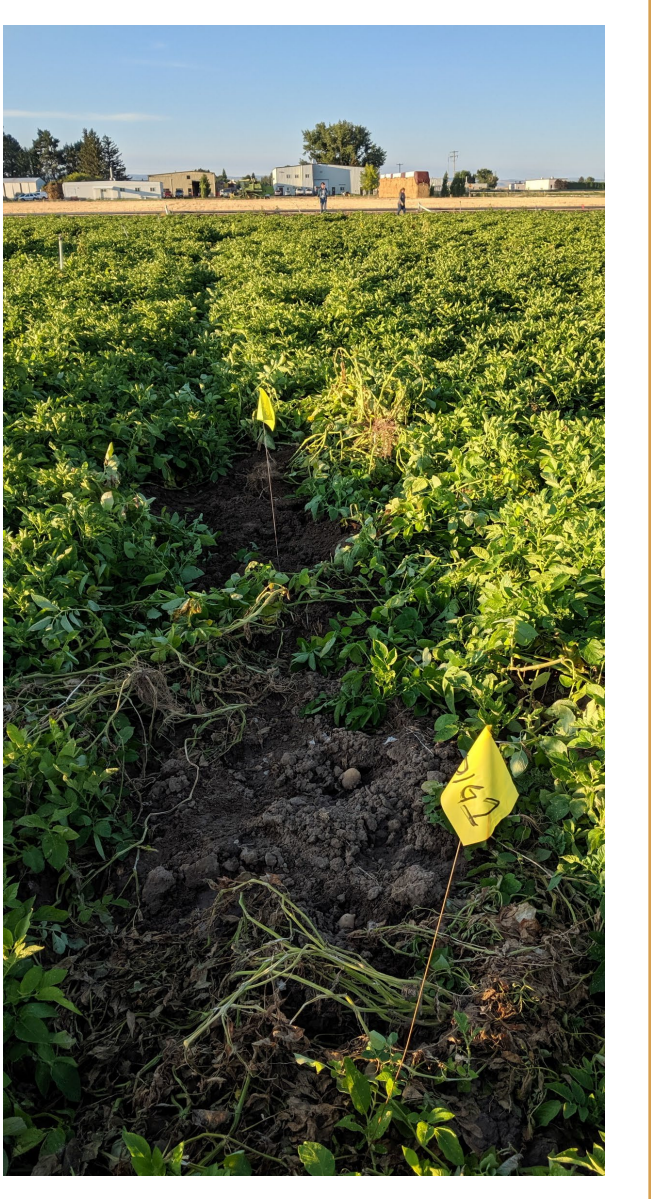
Methodology

Russet Burbank and Clearwater Russet were each examined over 2 field seasons in Kimberly, Idaho. Samples (5 plants; 15 tubers; 3 replicates) were hand-dug weekly and impacted on the bud and stem end of each tuber starting 7 weeks prior to harvest (early August until late September). Mechanical vine kill occurred 2 weeks prior to harvest.



Examined in years:
2019, 2020 for Russet Burbank
2021, 2022 for Clearwater Russet

For each weekly sample, tubers were at 55°F and impacted with a 3.5 oz aluminum dropped weight and evaluated for blackspot and shatter bruise. Russet Burbank was impacted at a 7-inch drop height and Clearwater Russet was impacted at a 12-inch drop height. The lower drop heights allow the study to focus on blackspot bruise, whereas the higher drop heights focus on shatter bruise. Tubers were held for 24 hours at 70°F after impact and prior to evaluation. Tubers were evaluated for the incidence and severity of blackspot bruise and the presence of a shatter bruise.



Results

Blackspot bruise susceptibility:

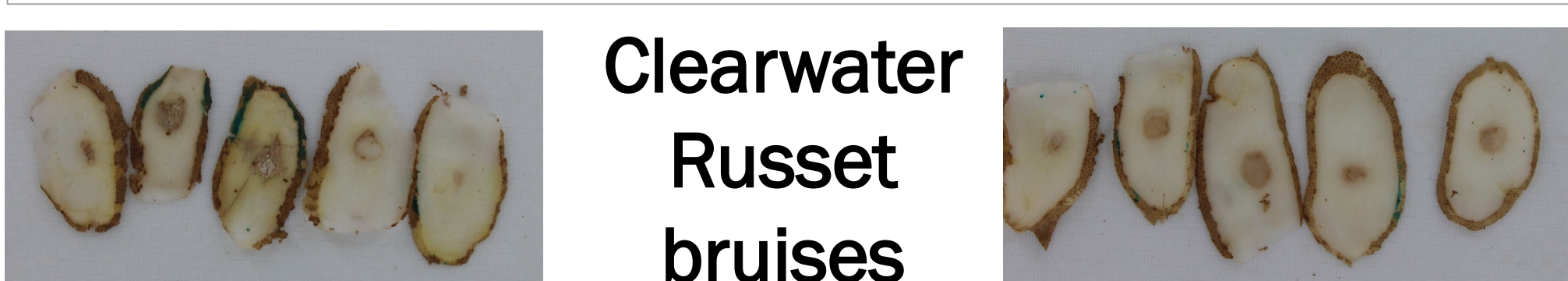
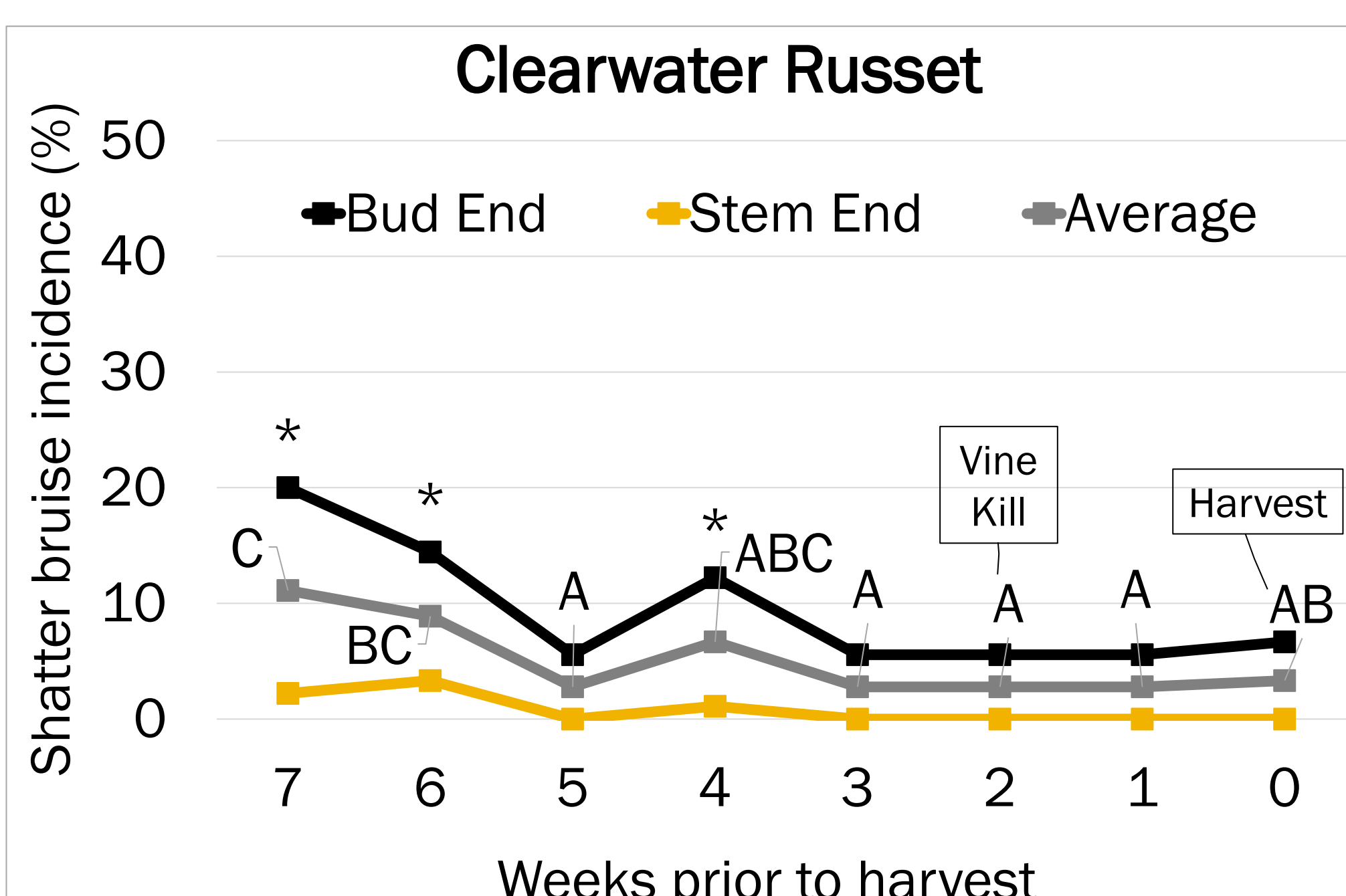
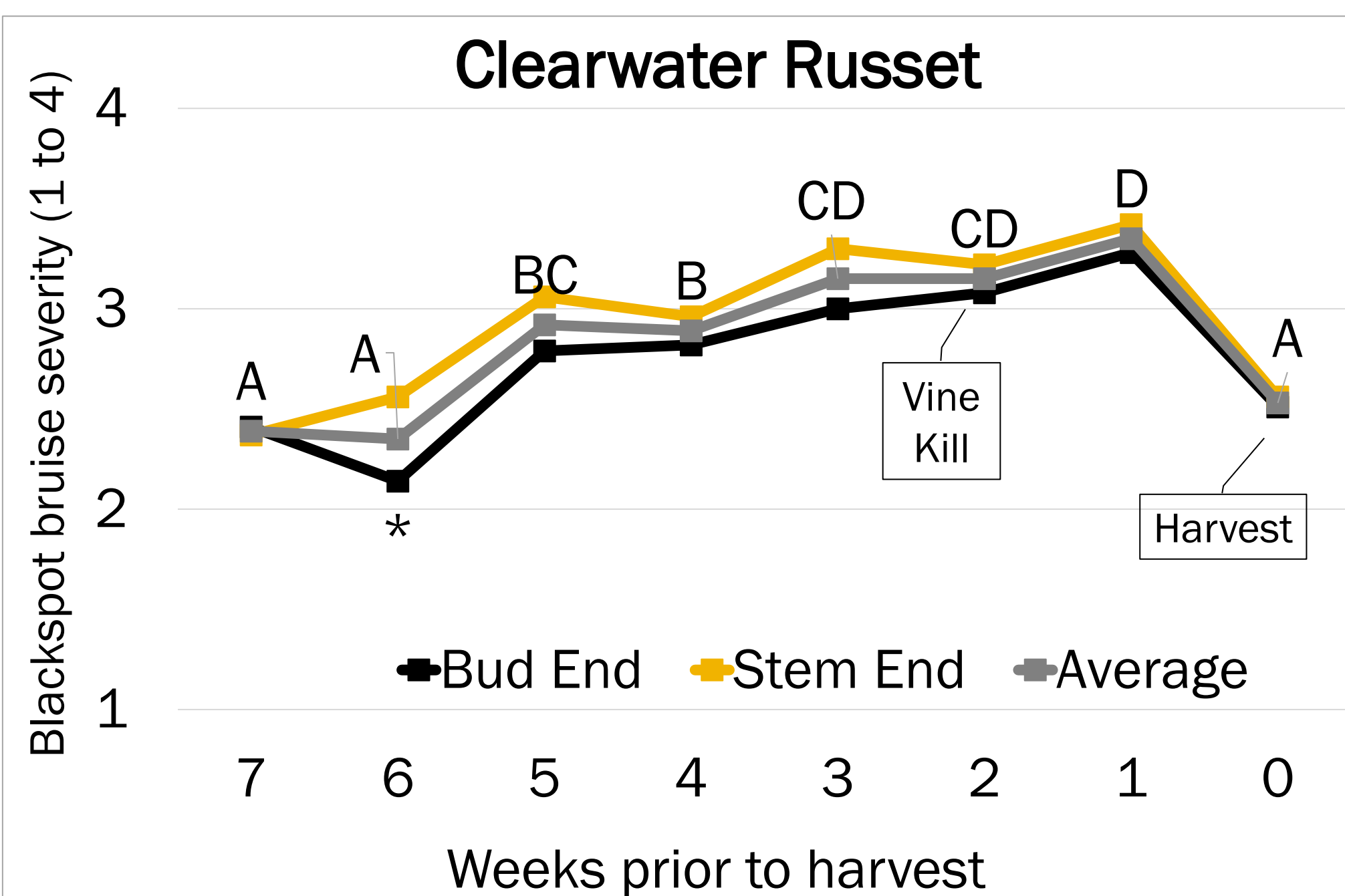
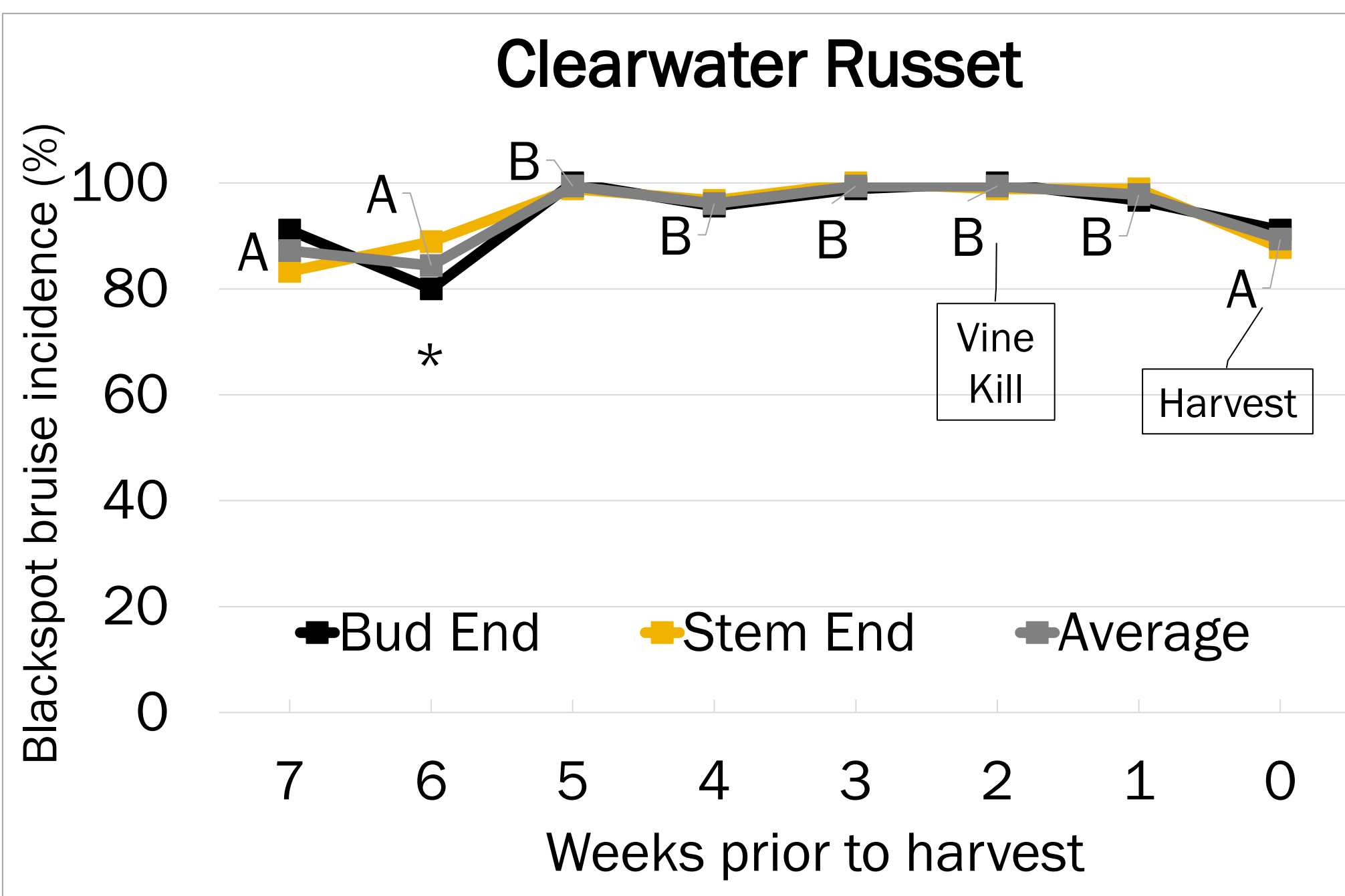
Blackspot bruise incidence and severity for Clearwater Russet increased during the weeks leading up to vine kill. After vine kill, blackspot bruise incidence and severity decreased to similar levels seen in the initial weeks (early August). Due to the high impact level, the bud and stem end of the tuber had similar blackspot bruise susceptibility.

For Russet Burbank, the incidence of blackspot bruise decreased when sampled closer to harvest, and this decrease was primarily observed on the bud end of the tuber beginning the week before vine kill.

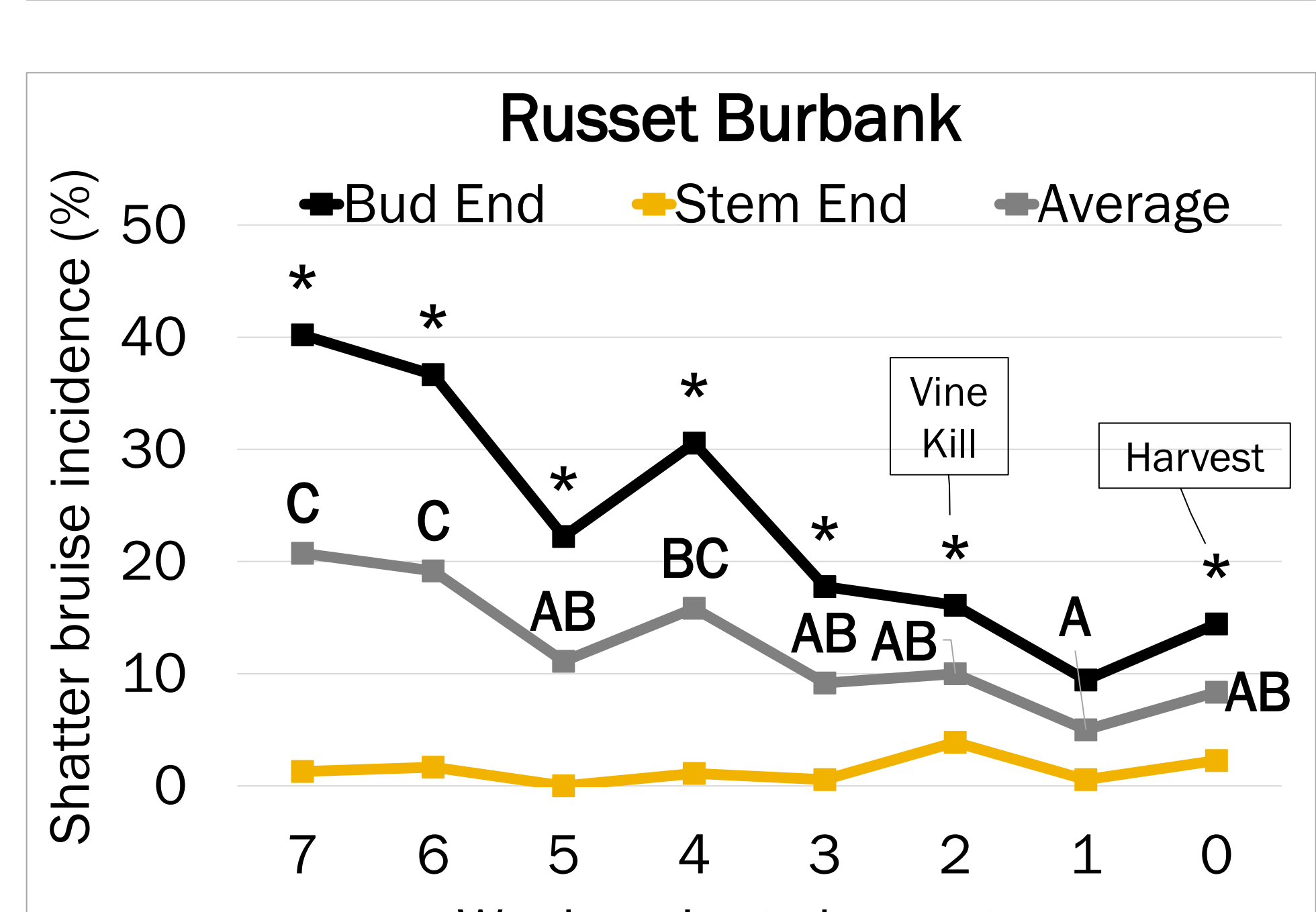
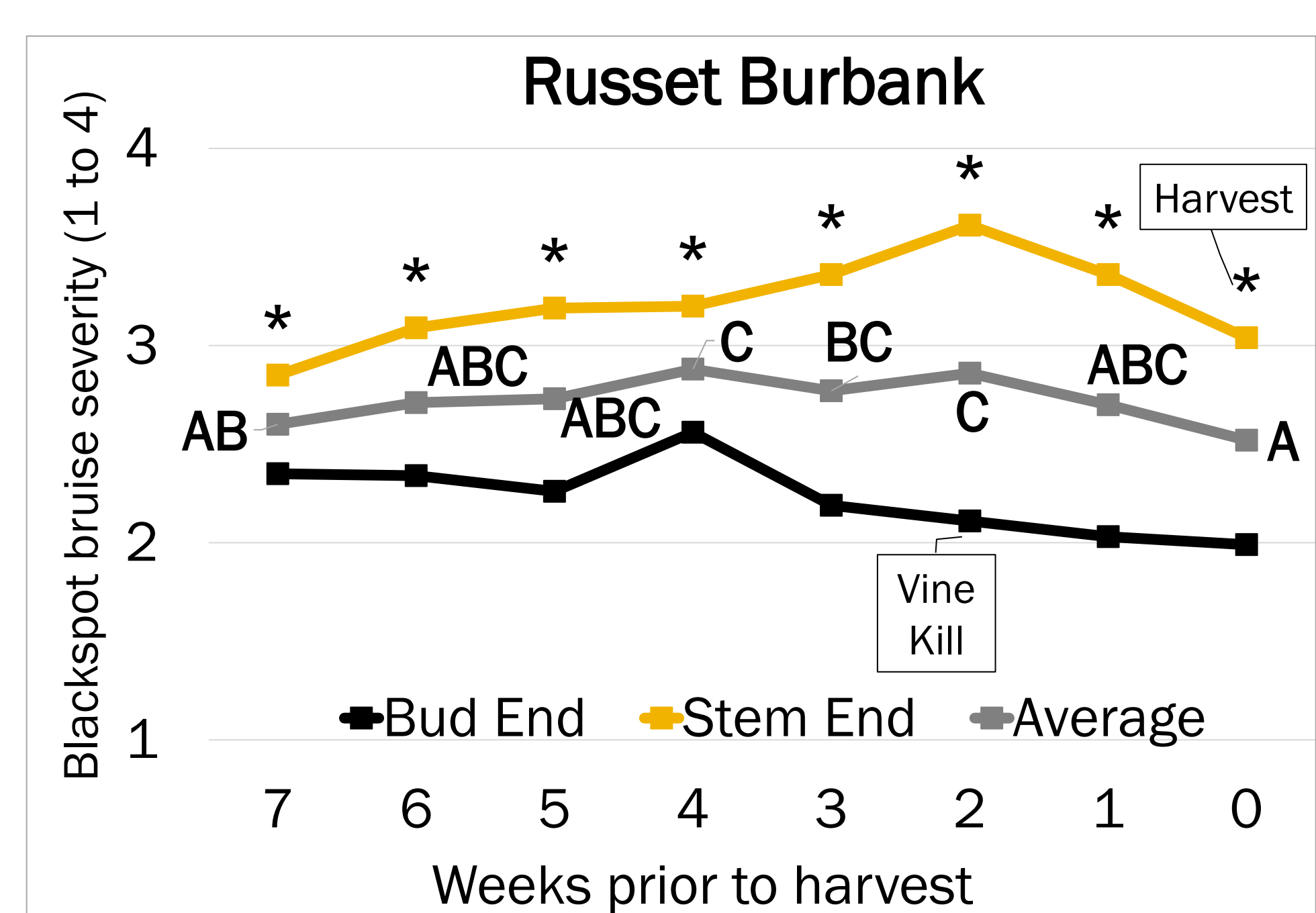
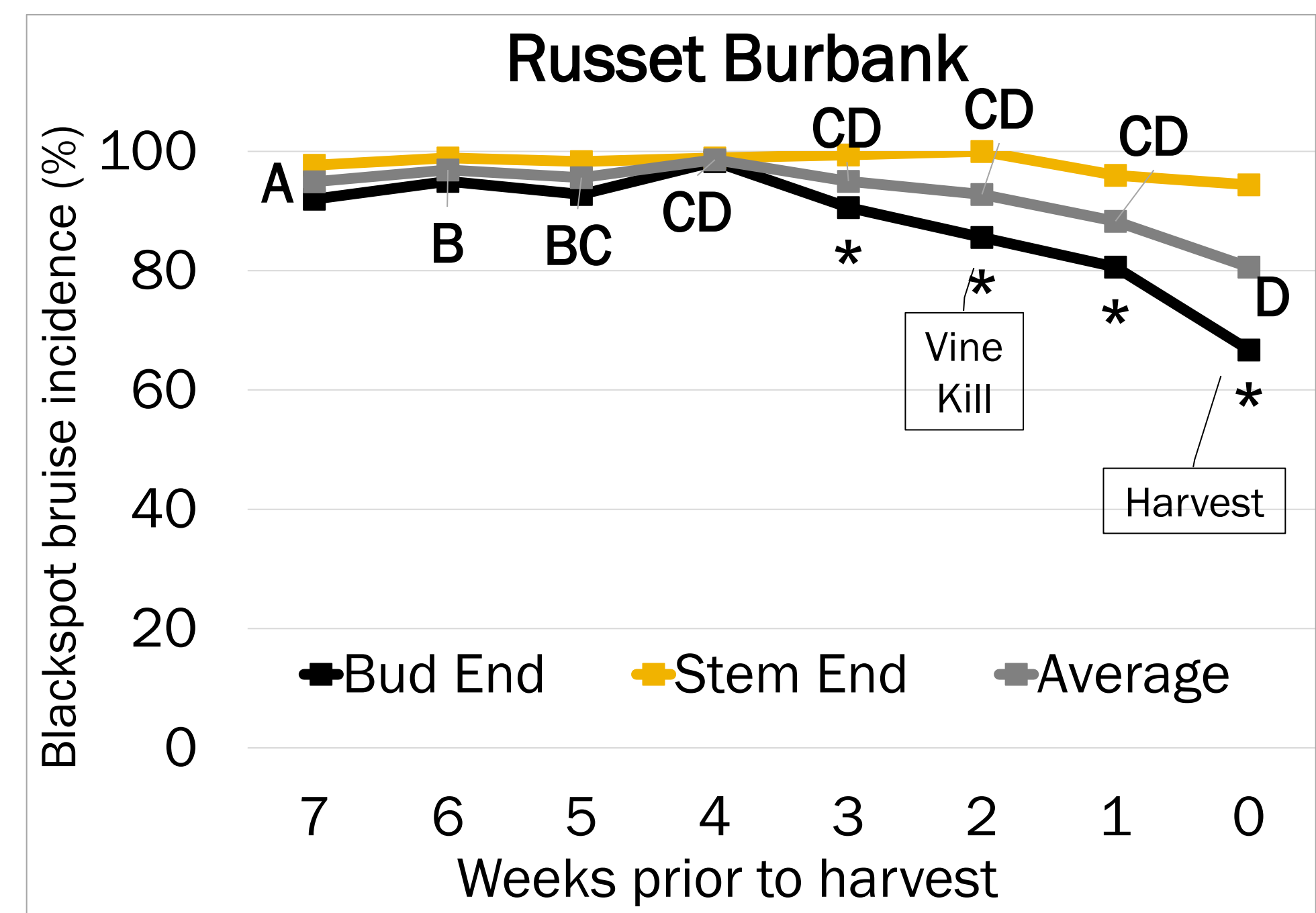
Blackspot bruise severity followed a similar trend as Clearwater Russet; however, the stem end had higher severity ratings compared to the bud end at each weekly dig.

Shatter bruise susceptibility:

For both varieties, shatter bruise incidence decreased the closer to harvest. The decrease in both varieties was primarily observed in the susceptibility of the bud end. The susceptibility of the stem end remained low. However, tuber end differences in Russet Burbank were seen in the weeks leading up to harvest, whereas in Clearwater Russet it was only observed up to 4 weeks prior to harvest.



In all graphs, * denotes weeks when tuber ends were significantly different, whereas differing letters show significance for the tuber average ($\alpha < 0.05$).



Conclusion

Blackspot bruise severity tended to increase leading up to vine kill for both varieties. Once vine kill occurred, blackspot bruise severity decreased. Blackspot bruise incidence decreased on the bud end for Russet Burbank leading up to harvest. Shatter bruise decreased in the weeks prior to harvest. Changes in susceptibility observed in this study may be due to tuber development, maturity, or other factors associated with the mid to late season growing season and can help identify timing of harvest to minimize bruise susceptibility. Observing bruise differences between tuber ends can help understand the contribution of timing and tuber development to bruise susceptibility.

Take-home message

In general, bruise susceptibility decreased leading into harvest. For blackspot bruise, this decrease was seen around vine kill, whereas shatter bruise susceptibility decreased prior to vine kill. This study provided additional insight into the influence of timing prior to vine kill and harvest on tuber bruise susceptibility, which can be used in a harvest scheduling and management plan.

