

Abstract:

Previous field experiments suggest that supplemental calcium applications can increase tuber calcium and decrease the incidence of internal defects. The present study extends this research to determine if tuber calcium deficiencies may also contribute to heightened bruise potential. For three seasons, 1999-2001, two commercially relevant (*Solanum tuberosum* L.) cultivars ('Russet Burbank', 'Atlantic') were supplied in the field with 168 kg.ha^{-1} supplemental calcium in a complete randomized design (three split applications) while control plots were given none. The supplemental calcium treatment CUC consisted of calcium nitrate, calcium chloride and urea. All plots received equal nitrogen. Calcium levels increased dramatically following supplemental calcium application with increase up to 30% compared to control. This result is consistent with earlier research showing that tuber calcium concentration can be significantly increased by application of soluble calcium during the tuber bulking period. Our results also demonstrated that, analyzed over three seasons, cultivars 'Atlantic' and 'Russet Burbank' showed reduction in blackspot bruising with calcium treatment as compared to control. Though the exact mechanism has not been determined, research suggests that improvement of tuber calcium concentration may lead to improved cell membrane stability and wall structure. Our study provides evidence that we have the potential for reducing tuber bruising through in season application of calcium.