

Performance of an Automated Slope Sensing System in Commercial Wild Blueberry Fields

Q. U. Zaman, A. W. Schumann, D. C. Percival

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Wild blueberry fields are developed from native stands on deforested farmland by removing competing vegetation. The majority of fields have gentle to severe topography. Spatial mapping of topography and fruit yield will help to manage the field inputs in a site-specific fashion. An automated cost-effective slope sensing system comprising of tilt sensors, DGPS and laptop was developed and mounted on an ATV for real-time slope measurement and mapping in wild blueberry fields. Four commercial wild blueberry fields were surveyed in Central Nova Scotia to evaluate the performance of the system. The automatically-sensed slopes (SS) were also compared with manually measured slopes (MS) at 20 randomly selected points in each field to examine the accuracy of the system.

The system measured slope reliably in selected wild blueberry fields. The relationship between MS and SS was highly significant (R^2 ranged from 0.95 to 0.99) in all selected fields. The SS map showed substantial variation in slope in the fields. MS slopes were overlaid on SS maps and exactly matched with the SS throughout the fields. Therefore, the use of low-cost and reliable accelerometers with Trimble AgGPS is a better option to develop cost-effective slope sensing system to quantify and map slopes (real-time) for planning site-specific management practices in commercial fields. The SS maps can also be used to adjust vehicle's speed at particular slopes to avoid accidents in wild blueberry fields having highly variable slopes.