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SPOT-APPLICATION OF PESTICIDE USING VARIABLE RATE SPRAYER IN WILD BLUEBERRY

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ABSTRACT A cost-effective automated prototype variable rate (VR) sprayer was developed for spot-application (SA) of agrochemicals in a specific section of the sprayer boom where the weeds have been detected. The 6.1 m sprayer boom was divided into 8 sections and mounted behind an all-terrain vehicle (ATV) at 76.2 cm above the ground. . The variable-rate control system consisted of 8 ultrasonic sensors (one per spray section) mounted on a separate boom in front of the ATV, Dickey John Land Manager II controller and flow valve, solenoid valves and an 8-channel variable rate controller interfaced to a Pocket PC (PPC) using wireless Bluetooth® radio with Windows Mobile® compatible software. This type of VR sprayer does not use prescription maps, but relies on sensors to provide real-time weed detection information which is used to dispense correct agrochemical rates for the weeds. The sprayer can be used for in-season, spot application (SA) of agrochemicals by activating specific boom sections where the weeds have been detected. Two wild blueberry fields have been selected in Central Nova Scotia to evaluate the accuracy of the VR sprayer. Water sensitive papers (targets) were stapled to weeds randomly selected in two tracks of each field. The papers were parallel to the ground. The percentage area covered (PAC) of the sprayed targets with both SA and uniform application was estimated using an imaging system. Non significance of the t-test for uniform versus SA targets PAC indicated that there was no significant bias in the SA and that the SA was accurate. Based on these results, the VR sprayer was cost-effective, efficient and accurate enough for spot-application of agrochemicals usage in wild blueberry fields

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