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Field evaluation and distribution uniformity of subsurface drip irrigation systems for half-high blueberry under different mulching practices

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Emitter clogging is one of the major drawbacks of subsurface drip irrigation systems which can seriously affect crop-yields significantly. The uniformity of water application in a subsurface drip irrigation system is an important aspect of the system performance. The objectives of this study were to better understand the drivers of the clogging phenomena and evaluate the uniformity coefficients of subsurface drip irrigation systems. This study was undertaken at St. John's Research and Development Centre, St. John's, Newfoundland and Labrador. The subsurface drip irrigation was designed and installed on a blueberry field (Figure. 1). Subsurface drip irrigation lines were installed with a 30" emitter spacing and a flow rate of 0.42 gal per hour. The blueberry field soil was slightly towards the clay side of the water depletion curve for the loam soil. Wood chip (10cm), sawdust (10 cm) and black plastic were used to maintain moisture and improve soil conditions. The distribution uniformity, emitter clogging and the performance of subsurface drip irrigation system were assessed using the randomly collected field data. Study results indicates that the coefficient of uniformity was found only 59.85% (wood chips), 34.25% (saw dust) and 33.65% (black plastic). It was found that the piping system was clogged in the mainline, submain line and the lateral pipes which eventually affected the flow rate through the emitters. An attempt to flush the main pipe lines reduced the emitter clogging significantly. This suggests that the lateral flushing and proper filtration system can control emitter clogging problems in subsurface drip irrigation systems.

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