

POSTER SUMMARY

REPLANTING SUGARCANE WITH SUBSURFACE DRIP TAPE *IN-SITU* IN THE CROPPING SEASON 2021/22

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Abstract

The Royal Eswatini Sugar Corporation (RES) has 15 056 ha under subsurface drip irrigation, with an average of 11 ratoons before replanting. The company spends more than E15 million annually on subsurface drip tape at replanting and during post-harvest maintenance. The experience over the years has been that the decline in the ratoon yield does not match the deterioration rate of the drip tape, as such fields are ploughed out, while the drip tape is still usable. Therefore, RES has begun an initiative to replant with the drip tape *in-situ*, in order to maximise the return on investment. In 2021, a trial was established on a 14th ratoon field to determine the possibility of replanting without replacing the drip tape. The field had been planted on 1.8 m tramline row spacing, 0.92 m between emitters and discharging 1.6 l/hr. The *in-situ* part of the trial covered 10.9 ha, compared to 8.7 ha on the conventional block. Before the trial was established, the crop after harvesting was killed by using glyphosate. Three passes were performed during land preparation by using internally-designed implements (a semi-tandem disc harrow, an inter-row ripper and a double-acting inverted disc harrow) on either side of the tape, compared to the five passes in conventional replanting.

Drip tape maintenance was done by connecting the new drip tape with a connector-fast, and ensuring that the drip emitters were facing upwards, just like the original drip tape. There were frequent repairs after the 1st and 2nd passes of the land preparation; these were caused by the pulling of the drip tape that was held within the soil clods in the *in-situ* block. No repairs were done after the 3rd pass. After repairing the visible damage in the *in-situ* block, water was pumped through the system after ridging, in order to identify any other leaks in the drip tape. A spade was used to unblock each drip tape lateral, by removing all obstacles that were pinching the drip tape, such as old cane roots. One-hundred-and-eighteen (118) man-days were used in the drip maintenance/repair activity in the *in-situ* block. The saving on drip tape was E17 376.89/ha. The replant costs for the *in-situ* part were 20.5% lower at E25,964.37/ha, versus E32,677,04/ha for the conventional system.

The data that were collected included the soil depth, lateral drip pressures, crop growth and yield. The plant cane yields in the *in-situ* trial were 86.8TCH and 11.8TSH, compared to 115.5TCH and 15.8TSH, in the conventional system, respectively. The conventional panels averaged 183 cm and were 2.8% taller than the *in-situ* panels (178.1 cm). The plant population for the conventional panel was 11.04% higher, compared to that of the *in-situ* panel, at 103,333 plants/ha against 93,056 plants/ha for the *in-situ* panels. The trial is still ongoing. Three other fields have been planted under drip *in-situ* and the implements are being improved in order to optimise the tillage process in subsequent fields.

Keywords: Subsurface drip tape, *in-situ*, ratoon, sugarcane