

BALING OF CANE TOPS

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Abstract

Because of the drought, cane tops that are normally burnt after harvesting were baled and used as cattle feed. The baled cane tops were supplied to local Swazi farmers and to a feedlot which was built on the company ranch. During the course of the 1992 crop, three rotobalers were purchased and, on an area of 7 000 ha, most of the cane tops were baled. Over 22 000 bales were made and sold at cost (E20) to numerous farmers who collected them from the estate. The demand was greater than the supply, which averaged 88 bales of 350 kg per day. Performance figures and costs of the three machines used are given.

Introduction

All cane at Ubombo is burnt before hand cutting and six lines are placed in a windrow. Once the cane is laid with three lines of tops on either side of the windrow, topping takes place. The quantity of tops thus accumulated is sufficient for side delivery rakes to rake six lines of tops into a windrow on top of the cane row. This operation only takes place once the cane has been loaded and sent to the mill, normally about 48 hours after cutting. After cane tops were windrowed, it was necessary to purchase a baler suited to local conditions.

Method

Various types of balers were investigated, and it was decided that a 1,2 m round baler with steel rollers would be preferable to a rubber belt type, mainly due to the abrasive qualities of cane tops, and because stones would be picked up in the field. The stones posed a threat to the rubber belts.

A Welger RP200 baler was purchased, which has 17 steel ribbed rollers around the perimeter of the chamber that are used to tumble the cane tops into a round bale. The baler is tractor drawn and the cane tops are gathered by its pickup reel located at the base of the machine. Once the intake of cane tops begins the rollers tumble the trash into an ever increasing circle which finally becomes a round bale of 1,2 m diameter and 1,2 m width. The mass of the bale varies from 300 to 400 kg depending on the moisture content of the trash.

Once the trash has been compacted to a pre-determined pressure, a trip lever automatically drops a length of twine into the trash in the compaction chamber. The twine is pulled around the bale to secure it. During this operation the operator must stop the forward motion of the machine to prevent more trash entering the chamber. Once the bale is secure two automatically operated hydraulic rams mounted on either side of the chamber, lift the tail gate and the bale is ejected.

Results

Due to various limiting factors the output of the baler varied from 8 to 20 bales per hour, and 88 bales was the daily average. The best single day's production from one machine was 183 bales. Cane variety had a marked effect on output per hectare, which varied from 1 500 to 18 000 kilograms of tops (see Table 1).

Table 1

Effect of cane variety on cane top mass (kg/ha)

	NCo376	N14	N19
Low	1 800	1 500	1 957
High	16 920	18 069	9 328
Average	5 234	4 300	4 089

The time of burning also had a marked influence on the amount of cane top left on the stalk. Far more cane tops that were burnt in the early morning remained in fields compared with those burnt either at midday or late afternoon.

Cane tops do not provide good quality feed, but during the 1992 season they kept thousands of head of cattle alive that would otherwise have died. Swazi farmers had no hesitation in collecting and paying E20 per bale (estimated to be the cost of production), sometimes reselling bales at more than double the purchase price. The nutrient analyses of two bale samples are shown in Table 2.

Table 2

Nutrient content of two cane top bale samples

Var	N %	P %	K %	S %	Ca %	Mg %	Zn ppm	Mn ppm	B ppm
N14	0,20	0,06	2,05	0,16	0,18	0,22	22	34	4,50
N14	0,59	0,09	1,36	0,13	0,19	0,25	12	29	5,30

Servicing and maintenance of the baler took place each morning while dew on the cane tops dried, and operations began at about 10.30 am. Baling continued until sunset. If wet tops were baled, decomposition started within days. The bales were lifted by a Cameco SP3000 cane loader on to a trailer with a carrying capacity of 20 bales; and were then transferred to an area for safe keeping. The loading operation included loading in-field, offloading at the secure area, and finally loading onto the purchaser's vehicle. Demand was greater than expected, which led to the purchase of two additional Claas 46 balers (Figure 1), which are more robust and have a higher above ground clearance than the Welger baler. Fuel used and costing are shown in Table 3.



FIGURE 1 Round baler in action.

Table 3
Fuel use and costing

Operation	Fuel (litres)	Hours	Litres/hour	No. bales	Bales/hour	Litres/bale	Cost E/bale
Labour				19 913			2,73
Baler maintenance*				19 913			4,80
Baler depreciation**				24 000			6,25
Tractor costs	7 880	1 549	5,09	19 913	12,85	0,39	1,25
Baling	7 880	1 549	5,09	19 913	12,85	0,39	15,03
Loading/offloading	7 753	763	10,16	22 258	29,17	0,35	1,89
Loading/offloading	7 753	763	10,16	22 258	29,17	0,35	1,89
Transport	5 731	559	10,25	22 258	39,82	0,26	1,03
Supervision				22 258			2,00
Total	21 364	2 871	7,44	22 258	7,75	0,96	19,95

* Includes twine (estimated at E2,50 per bale)

Conclusion

During the 1992 season, baling of cane tops kept many Swazi farmers' cattle alive, and all users of the product were very grateful that the feed was made available to them. An adjacent game park also purchased numerous bales to keep rhino, elephant and other animals alive.