INFLUENCE OF PLANTING AND HARVESTING SEASON ON SUGARCANE PRODUCTIVITY

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Introduction

The planning of harvesting the sugar cane crop search optimize the economic return of culture, based on the concept that the cane has a time during the year, when occurs maximum concentration of sucrose in stems, more suitable for processing. To achieve this optimization is necessary to generate data capable to model cane development and ripening among different conditions.

The environmental conditions promotes different results in the plants according to the developmental stage which they are, so the availability of sufficient water during the emergency and tillering of the plants of cane will result in abundant stand and cane production. The same situation during the maturation physiological processes will in the other hand cause inversion of sucrose which will not be interesting at time of harvest (Van Dillewijn, 1952, Humbert, 1968, Alexander, 1973).

This work was carried out based on assumptions that there are many interactions between planting dates and shooting and cutting times, which have influence of environmental factors, thus each planting season could influence the results as a consequence of TCH (tones of cane per hectare) and each time the harvesting could affect the results of ATR (total recoverable sugar per ton of cane) and the assumption that there is interaction of all treatments with size of the seed cane at the planting operation, in particular if it is mechanized.

Materials and Methods

This work was conducted in CTEP - Field testing of the former SP COPERSUCAR located on highway 127, in Piracicaba – SP, repeated during 5 years, from 1983 to 1987 with 3 varieties, but this paper will focus only at the

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first cut of one variety, SP70-1143, planted in 1983/1984 and harvested in 1985, with emphasis on the size of the seed cane as a concern to planting mechanization. The soil type used was the Red Eutrophic (EMBRAPA, 1999) that had no serious problems of erosion, as would be planted in the months of highest precipitation.

The treatments were, in the plots - planting dates: November (83), January (84), March (84) and May 1984), the subplots - the harvest dates: May (85), July (85), September (85) and November (85), and the sub-subplots – whole stalk as seed cane and 3 bud seed cane (size of seed cane).

The design was randomized blocks in split split plots with tracks, with five replicates. The plots were eight furrows of 50 m, divided into 4 subplots of 10 m in length, separated by 2 m of cane, including the beginning and end of the plot. In turn, the subplots were divided into two sub-subplots, each one with four rows.

The causes of variation were: effect of planting date, the harvest date and size of seed cane for each variable. Variables were measures of production: tons of stalks per hectare (TCH), total recoverable sugar (ATR), and tons of sugar per hectare (TAH).

Results and Discussion

The values of TCH, ATR and TAH generated for the planting and harvesting seasons in the treatments with whole stalk and chopped cane planting in row were subjected to analysis of variance and averages compared by Tukey test.

Table 1 displayed show the values of the analysis of variance for variables ATR, TCH and TAH in the first harvest. As it can be seen, for the variables TCH, ATR and TAH significant effects of the harvest date and time of planting were observed. The size of seed cane had significant effect only for the variable TCH.

Table 1 - Summary of Tables of analysis of variance of data obtained for the variety SP 70-1143, for the dependent variables TCH, ATR and TAH in various combinations of planting dates and harvesting and size of seed cane.

		TCH	ATR	TAH
C. Variation	*GL*		*QM*	
BLOCKS	4	--	--	--
HST DATE - HD	3	1346,212**	17970,263**	159,991**
Residue (a)	12	282,879	108,966	3,959
PL DATE - PD	3	1139,216**	2925,482**	58,395**
Residue (b)	12	276,676	36,448	5,354
SEED SIZE - S	1	613,207*	119,491	5,860

HD * PD	9	356,786*	742,263**	15,665**
HD * S	3	42,855	9,738	1,307
PD * S	3	448,411*	42,196	5,937
HD * PD * S	9	20,760	28,149	0,573
Residue (c)	100	154,960	31,809	3,595
Total	159	--	--	--

There was an interaction of planting dates within harvest period for the three variables, indicating significant effect of planting dates for each season of harvest, as already known by growers. For TCH was found an interaction of size of the seed cane in planting dates, indicating a significant effect of the amount of reserve tissues presented in the seed cane available for different conditions of humidity and temperature of the soil in different times of the year.

Table 2, it is observed that for this variety there was a statistically significant difference between the means of TCH for size of the seed cane in different dates of planting.

Table 2 - Mean values of TCH of size of seed cane in interaction with planting dates.

EPPLA	Treatment	TCH Mean
Mar	Chopped cane	101,31 a
Mar	Whole stalk	100,83 ab
May	Whole stalk	98,90 abc
Jan	Whole stalk	98,09 abc
Jan	Chopped cane	94,95 abc
Nov	Chopped cane	89,12 bc
Nov	Whole stalk	88,50 c
May	Chopped cane	85,29 d

Averages followed by same letters do not differ statistically among themselves.

The planting season in March obtained better yield of sugarcane than the planting dates in November and May. The planting season in May with smaller size of seed cane had the lowest value of TCH. For the planting season in March, January and November, there was no statistically significant difference between the two sizes of seed cane used, but also in these periods there was no problems in water suply for emergency, but for the planting season in May, when a dry period had occurred, there was difference between these treatments, being significantly higher yield when the whole stalk was used to plant the cane.

The precipitation for the month of April to July was low and there was a drop in temperature. May is considered less favorable time for planting cane

because of its climatic conditions, characterized by decrease in temperature and higher water deficit. These results suggest that to plant at this time it is better to have a bigger seed cane because of its reserves and moisture.

Lee et al. (1984) also noted that when a period of drought, the planting of cane compared with whole stalk full of gems shows three minor flaws and "stand" final best. In the case studied, occurred 30 days after planting of drought plus high temperature and in these conditions the loss of moisture was much higher than in whole cane.

Van Dillewijn (in 1952) said to be the minimum length of seed cane mainly determined by the quality of the cane used and the conditions for growth. In areas with favorable conditions, it can be used seed cane with two or only one bud developed. In regions with less favorable conditions, the length of the seed cane has to be increased appropriately as well as in plantations in autumn in temperate regions, where conditions are bad for shooting.

The mechanization of the planting must consider the size of the seed cane according to the time of the year when the operation is being done.

Conclusions

Planting dates affect TCH, ATR and TAH, and size of seed cane affects the production in the plant cane in certain weather situations with a great interaction of planting dates. Harvesting dates affects TCH in vegetation by the time (age), the ATR by the ripening process and TAH as a result of the above.

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