PRODUCTION OF SUMMER HARVESTED SUGARCANE

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Introduction

In South Africa, sugarcane has traditionally been milled between April and December. Questions regarding the yields of crops harvested between December and March are being raised. These questions arise from speculations of extending the milling season as the industry is increasingly deregulated. Additional cane milled without increasing milling capacity can only be done by lengthening the milling season, and will be economically very beneficial to the miller. The milling season can be lengthened by (1) starting the milling season earlier, (2) milling later or (3) starting earlier and closing later. An earlier opening of mills in the **northern areas** would require crops to be harvested during March. The alternative option would be to open in April and continue harvesting and crushing to the end of January. Both options are perceived to have elements that will affect productivity detrimentally. Over a period of 12 months, February crops intercept more sunlight (82% of photosynthetically active radiation) (PAR) than April crops (69% of PAR). This is largely due to the canopy of a February crop closing within a much shorter period (65 days) than an April crop (165 days) (Inman-Bamber, 1993). January and February crops may therefore be expected to produce greater biomass than March and April crops. Studies of sugarcane production outside the traditional milling season have seldom been done and the characteristics of annual crops harvested at these times are poorly described. Consequently an experiment was initiated at Pongola during 1995-96 to measure yields of annual crops harvested during late summer, and existing data from two growth analysis studies are briefly reviewed.

Review of previous experiments

Gosnell's data – 1969

The study deals with the effects of increasing age on sugarcane growth. The general conclusion is that age has a marked effect on sucrose content up to the age of 12 months of a spring start and up to 16 months of an autumn start. Regression analysis on data from which the immature cane was excluded indicates that age has no effect on sucrose content during 12-24 months, which is in contrast to a strong seasonal influence (Figure 1).

Rostron's data – 1974

In the study on the effects of starting times on the growth and yields of sugarcane, crops were started eight weeks apart through the year. The data show large differences in all yield parameters at early ages for different starting times; these differences narrow with time (age). Data interpolated from ages of 48 and 56 weeks suggest that at 52 weeks (12 months): cane yields of April>January/February>December **starting times**; sucrose content of December>January> February>April cycles; sucrose yields of January>December >February>April cycles.

Data from cane **harvested** between the ages of 32 and 56 weeks show that cane yields for March are higher than for January crops. Crops harvested in January have better cane quality than March crops after the age of 40 weeks (Figure 2).

The interpolated sucrose yields of January crops are slightly better than or equal to March crops (Figure 3).

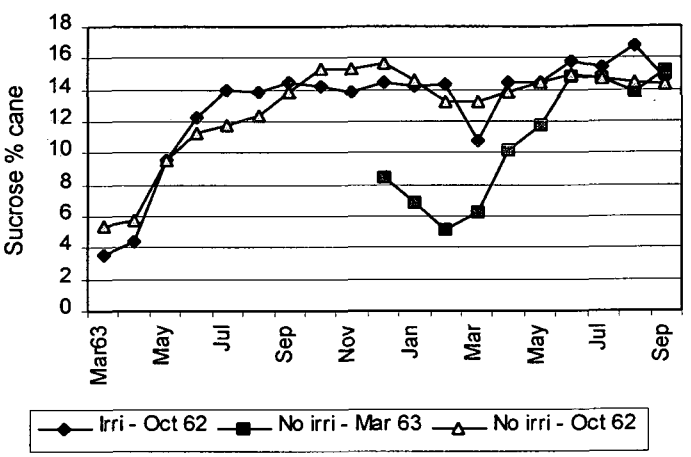

Figure 1. Effect of age on sucrose content of irrigated (irr) and non-irrigated (no irr) crops started in October 1962 and of an irrigated crop started in March 1963 (after Gosnell, 1968).

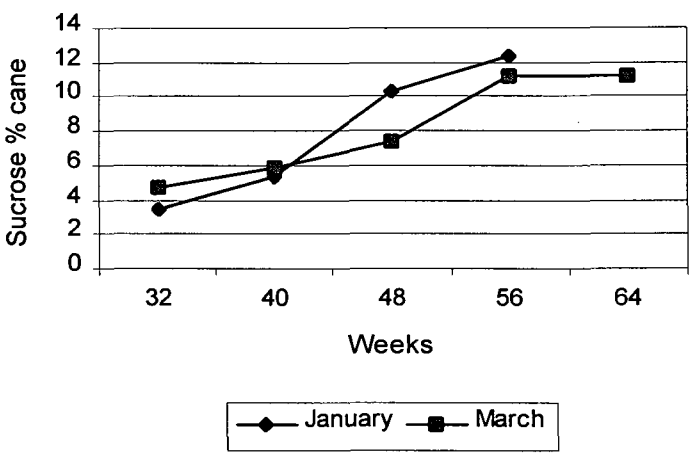

Figure 2. Effect of age on sucrose content of crops harvested in January and March (after Rostron, 1974).

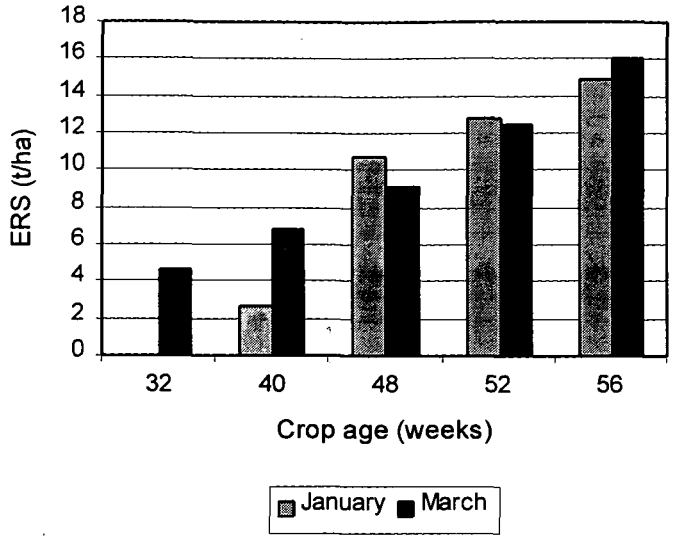

Figure 3. Estimated sucrose yields of January and March crops harvested at different ages [52 weeks taken as mid-point of 48 and 56 weeks] (after Rostron, 1974).

Pongola experiment – N14

During 1995 at Pongola, an experiment was initiated on the variety N14 to measure yields of crops harvested annually during December, January, February and March. Fusilade Super (fluazifop-butyl) was applied 35 to 42 days before harvesting. The partitioning of aerial biomass into various components was investigated. Cane yields, sucrose content and sucrose yields of the December crop were superior to the crops harvested in the other months. The trends for all these parameters were December>January>February and March (Figure 4). In this experiment cane yields of January and March crops were similar, while sucrose content (ers % cane) of the January crop was 2 units higher than that of the March crop. The ripener raised the sucrose content of the December, January and February crops by more than one ers unit but unexpectedly, not of the March crop.

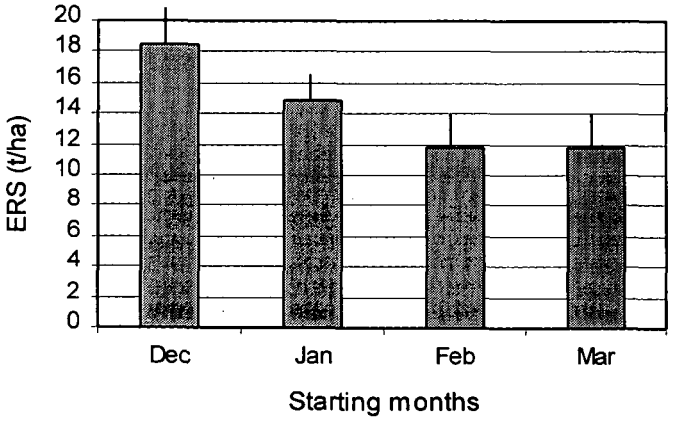

Figure 4. Estimated yields of N14 harvested in summer at Pongola.

Conclusions

Data presented indicate that both grower and miller will benefit more from cane harvested annually in January than from a March crop. Besides crop characteristics, other factors that may influence the overall productivity are labour availability, the discomfort of laboring in summer heat, rainfall causing delays in cane extraction and higher ash at the mill, wet infield conditions causing compaction, higher temperatures affecting canopy development and related weeding costs. Predisposition to lodging and diseases may also need to be considered, since they also have significant impact on productivity.

REFERENCES

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