RESPONSES OF THREE EARLY MATURING VARIETIES AND N12 TO DIFFERENT RIPENER TREATMENTS

RA DONALDSON

South African Sugar Association Experiment Station, Private Bag X02, Mount Edgecombe, 4300

Introduction

It is known that N14 responds poorly to ethephon and that a higher rate of fluazifop-butyl than is used for NCo376 is necessary to ripen it. Therefore it is possible that other varieties also respond differently than NCo376 to these ripeners. There is also little information on responses to a combination ripener treatment, particularly on varieties other than NCo376. In two experiments a range of varieties were treated with fluazifop-butyl, ethephon and the combined spraying of ethephon followed by fluazifop-butyl to address these issues and as part of an ongoing assessment of variety responses to ripeners.

Methods and materials

Two experiments conducted at Pongola were sited on a deep structured Hutton form soil. The crops were irrigated and they were harvested during the first two weeks in May. Four successive crops of N19, N22, CP66/1043 and N12 were harvested in experiment 1 and two crops of N22 and NCo376 in experiment 2. The ripeners applied were ethephon (1,5 L/ ha), fluazifop-butyl (300 mL/ha) and ethephon (1,5 L/ha) followed by fluazifop-butyl (300 mL/ha) (hereafter referred to as the combination treatment). Ethephon was applied between 69 and 84 days and fluazifop-butyl between 40 and 58 days before harvesting. A tractor mounted boom (plant crop in experiment 1) or a hand held boom with TK 1,0 floodjet nozzles delivering 7 mL/s^{-1} per nozzle were used to apply the ripeners. Sixteen stalks were taken from each plot at the time of spraying ethephon and at intervals thereafter. The samples were weighed and analysed in the conventional manner for brix, pol and dry mass. Final yields were estimated from harvesting and weighing two undisturbed cane rows in each plot when the crops were about 12 months old. Yields before the harvesting were estimated as follows:

mass from 16 stalks ÷ final mass of 16 stalks x plot yield/ ha.

Results and discussion

Unripened cane yields were estimated to have increased on average by 43 to 52% and sucrose yields by 68 to 78% during the final three months of experiment 1. The rapid sucrose accumulation during the late stage of the crop is particularly interesting since it is during this time that ripeners raised sucrose yields on average by 1,9 tons/ha in experiment 1 and by 3 tons/ha in experiment 2. In May the sucrose content of untreated cane was highest in CP66/1043 at 51,9% dry mass (DM) and lowest in N12 at 43% DM; ripeners raised these by 3,6 units to 55,5% DM in CP66/1043 and 46,6% DM in N12.

Ethephon gave generally poor results, eliciting good responses in only one crop each of N19 and N12 in experiment 1. NCo376 responded well to ethephon in both crops of experiment 2 and N22 responded in only one crop. Sucrose yields of CP66/1043 were best after treatment with fluazifop-butyl and were not raised by ethephon. The other varieties responded best to the combination treatment – this being most consistent in NCo376 and N19. Fluazifop-butyl was nearly as effective (92%) as the combination treatment on N12. Such relatively small gains from the combination treatment may not always warrant the greater cost of the treatment. Deciding on the best ripener treatment for varieties that respond similarly to N12 may therefore need careful economic consideration.