

AN EVALUATION OF VARIETY N12 IN FIELD TRIALS

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Abstract

Variety N12 was released in the rainfed areas of the South African sugar industry in 1979. Its many good features, including resistance to mosaic, superior sucrose yields particularly in high altitude areas, tolerance of moisture stress and waterlogged conditions and general reliability, have resulted in N12 being planted extensively throughout the rainfed parts of the industry. In the 1997-98 season, N12 accounted for 32% of the total cane crush and it is the most widely grown variety in the industry.

Since 1980, N12 has been included in 53 trials in the agronomy released varieties trials programme, and harvested on 237 occasions. Trial results in terms of sucrose content, cane and sucrose yield are reviewed, and the effect of age of harvest and region are compared with varieties NCo376 and N16. Other factors discussed are the performance of N12 during periods of drought, crop stage and month of harvest.

N12 is a variety clearly suited to a longer growing period and has proved very productive in the higher altitude regions. In the coastal regions where harvesting is generally conducted annually, it has filled a valuable role in less favourable conditions and as carryover cane, but under more productive conditions in the Zululand /Umfolzi regions, has been outperformed by NCo376 and N16.

Introduction

Variety N12, bred at the Experiment Station in 1962 from a cross between NCo376 and Co331, was released for production in the rainfed areas in spring 1979. At its release, N12 was known to be more resistant than NCo376 to mosaic and to be slightly susceptible to smut. Grower acceptance of the variety was initially slow, and eight years after its release, N12 accounted for only 2,8% of cane crushed at the mills (Bond, 1992). Positive factors including its superior cane and sucrose yield, resistance to mosaic and tolerance of the relatively dry years of the 1980s, resulted in the variety being planted extensively over the next three years (Irons and Payn, 1992). In the Midlands region the area under N12 increased from 40% in 1990 to over 70% in the 1997-98 season. The success of N12 on Beaumont farm in the midlands was reported by Harding (1992). It is currently the most widely grown variety in the rainfed section of the industry, contributing 32% of total industrial production, compared with 24% of NCo376, and 42% of production in rainfed areas.

N12 has been most successful in the high altitude regions, but its general usefulness as a reliable, low risk and hardy variety has resulted in it being planted over a wide range of conditions in the rainfed parts of the industry. The germination

and early growth stages of N12 can be slow and the variety generally requires a longer period to reach maturity than most other commercial varieties. The presence of the pest *Eldana saccharina* Walker (Lepidoptera: Pyralidae) (eldana borer) has forced growers in the coastal regions to harvest annually a larger proportion of their area under cane (McCulloch, 1989). This in turn has led to questions regarding the performance of N12 under short cropping cycles. When N12 was evaluated, results from trials have indicated that age of harvest is an important factor.

On release of a new variety, the responsibility for continuing evaluation of the variety is passed from the Plant Breeding department to the Agronomy department's released variety trials (RVT) programme. The objectives of the RVT programme are to compare the performance of new varieties with currently grown varieties in as wide a range of soil, climatic and management practices as possible, in order to update the variety recommendations.

Since 1980, variety N12 has been included in 53 RVT trials. Comparisons of yield and cane quality have been made with NCo376 and N16 on 237 and 129 harvest occasions respectively. Variety NCo376 has been the standard in all RVT trials. Variety N16 was included in the comparisons of yield as it has proved to be a useful and productive variety, which in many rainfed areas of the industry is often grown adjacent to N12. N16 contributes 8% of total production and approximately 20% of the midlands crop.

The objectives of this paper are to review the yield performance of N12 in comparison with NCo376 and N16, in terms of sucrose content, cane and sucrose yield, and to evaluate the effect of age of harvest and of region. Other factors discussed are its performance during periods of drought and the effect of crop stage (ratoon) and month of harvest on production.

Methods

Details of the 53 trials established at 26 sites representative of the main sugarcane growing areas in KwaZulu-Natal are presented in Table 1. All trials, with exception of the Nkwalini (EVT 17) and Dalton (EVT23) trials, were conducted under rainfed conditions. While all RVT trials are planned, planted and harvested by the Agronomy department, a large proportion are managed by grower co-operators, and operations such as fertiliser application and weed control are conducted as normal farm practices.

Field trials were based on randomised block or latin square designs and had a minimum of five replications. Plot size ranged from five to eight rows of eight to ten metres. At harvest, the guard rows on each side of the net rows and 0,5 to

1,0 m at the end of each net row were discarded for growth measurements and recording of cane yield. Twelve of the harvested cane stalks in each plot were taken for sucrose analysis. Analyses of the components of yield were done by the Biometry department.

Results and discussion

The means of sucrose content and cane and sucrose yield of varieties NCo376, N12 and N16 in all trials are tabled in Appendix 1. Sucrose content is shown as pol% cane and cane and sucrose yield are expressed in terms of yield per hectare per 12 months (tc/ha/12 mths and ts/ha/12 mths respectively).

Age at harvest

An evaluation of the data indicated that age at harvest had a substantial effect on the performance of N12. A regression

analysis of the medians indicated that sucrose yield was positively correlated with the age at harvest ($r=0,60$, $y=2,086x + 71,578$, where y is the relative sucrose yield of N12 as a percentage of NCo376 and x is the age of harvest in months. The correlation is moderate as other factors affecting yield were not included in the analysis.

The longer period required for N12 to reach maturity is apparent in both the sucrose content and cane yield components, as shown in Figure 2. The overall sucrose content of samples taken up to the age of 16 months averaged 2% more than NCo376, while those sampled from 17 months onwards were 6% greater. Cane yield showed a similar trend and the overall mean cane yield of N12 up to 16 months was 95% of NCo376 but 106% of NCo376 from 17 months onwards.

Table1. Selected details of N12 trial sites.

No.	Region		Site	Trial code/s	No. of trials	No. of results	Topography	Soil/ form
1	Midlands North	Midlands	Jaagbaan	RvtMb 2-6	5	24	Mid-slope	Hutton
2	Midlands North	Midlands	Harburg	Evt 13	1	3	Mid-slope	Inanda
3	Midlands North	Midlands	Dalton	Evt 23	1	4	Lower slope	Hutton
4	Midlands South	Midlands	Eston	Evt 9	1	3	Upland	Cartref
5	Midlands South	Midlands	Mid- Illovo	Rvt Wg.	1	3	Mid-slope	Inanda
Sub-total					9	37		
6	Lower S Coast	Hinterland	Paddock	RvtCh 2-8	7	30	Mid-slope	Longlands
7	S Coast	Hinterland	Mgayi	Evt 3	1	7	Plateau	Cartref
8	S Coast	Hinterland	Dumisa	Evt 11	1	4	Mid-slope	Glenrosa
9	N Coast	Hinterland	Up. Tongaat	Evt 4	1	6	Mid-slope	Inanda
Sub-total					10	47		
10	Lower S Coast	Coastal	Umtentweni	Evt 18 a/b	2	9	Crest	Glenrosa
11	S Coast	Coastal	Sezela	Evt 1	1	7	Slope	Glenrosa
12	S Coast	Coastal	Sezela	Evt 6	1	3	Valley	Kroonstad
13	S Coast	Coastal	Bazley	Evt 16	1	4	Crest	Glenrosa
14	S Coast	Coastal	Equeefa	Evt 22	1	3	Valley	Dundee
Sub-total					6	26		
15	N Coast	Coastal	Ottawa	RvtCn 2,4,5,7,9	6	36	Upland	Milkwood
16	N Coast	Coastal	Hillhead	RvtCs 2,5-10	7	22	Mid-slope	Coast sands
17	N Coast	Coastal	Umhlali	Rvt 18	1	5	Mid-slope	Longlands
18	N Coast	Coastal	Shakaskraal	Rvt 21	1	5	Upland	Westleigh
Sub-total					15	68		
19	Zululand	Coastal	Gingindhlovu	Evt 8	1	5	Lower slope	Swartland
20	Zululand	Coastal	Gingindhlovu	Evt 24	1	3	Lower slope	Kroonstad
21	Zululand	Coastal	Mtunzini	RvtCz 2-7	6	27	Mid-slope	Shortlands
22	Zululand	Coastal	Nkwalini	Evt 17	1	4	Valley (irrig)	Katspruit
23	Zululand	Coastal	Empangeni	Evt 19	1	4	Mid-slope	Hutton
Sub-total					10	43		
24	Umfoloji	Coastal	Monzi	Rvt 19	1	5	Flat	Alluvium
25	Umfoloji	Coastal	Mtubatuba	Rvt 20	1	7	Upland	Hutton/sand
26	Umfoloji	Coastal	Monzi	Evt 21	1	4	Flat	Alluvium
Sub-total					3	16		
Total					53	237		

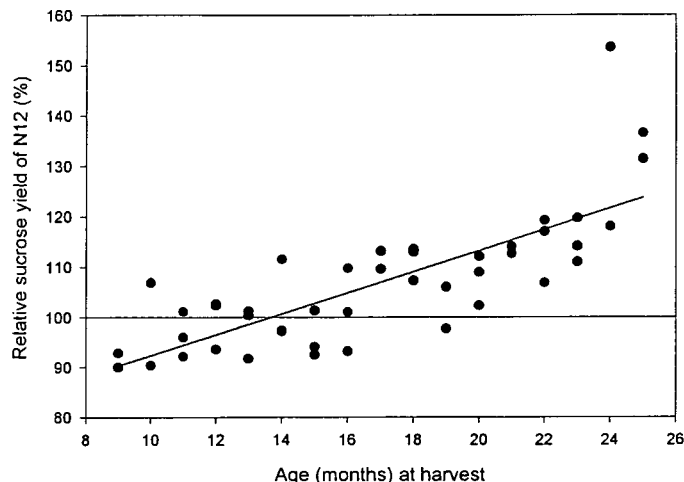


Figure 1. Age of harvest: sucrose yield of N12 relative to NCo376 (100%)

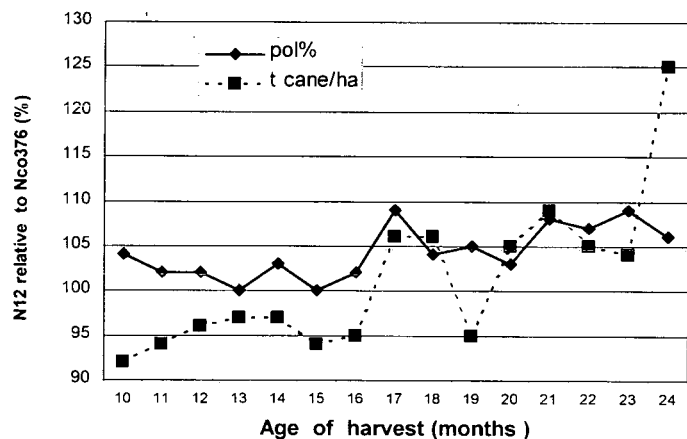


Figure 2. Age of harvest: comparison of components of N12 with NCo376 (100%)

Comparisons of the components of yield (pol% cane, tc/ha, ts/ha) of N12 are expressed as a percentage of NCo376 and N16 in Tables 2 and 3 respectively. The figures shown reflect the means of all trial results and also when divided into three regional categories: midlands, hinterland and coastal. It is apparent that, on average, N12 gained a substantial yield advantage over NCo376 only when harvested from the age of 17 months and older.

Performance by region

The mean age of harvest varied with region. Although the range of harvest ages was wide, the average in the coastal region was between 12 to 14 months, in the hinterland 17 to 20 months and most midlands trials were cut between 19 and 24 months. The midlands region accounted for 16% of the trial results, the hinterland area 20% and the balance of 64% was from the coastal sites.

The coastal data were further divided into South and North Coast, Zululand and Umfolozi regions. Table 4 shows the comparisons of the mean sucrose yields (ts/ha/12 mths) of varieties NCo376, N12 and N16 by trial site and region. Discussion on some aspects of the results follows:

Midlands region. Trials were mostly on favourable soils (Hutton and Inanda forms) but included a Cartref form, which proved very productive. Harvested at an average age of 22 months, N12 yielded 13% (+0,9 ts/ha/12 mths) more than NCo376, but its performance when cut annually (Evt 23) was only 73% of that of NCo376. On average, N16 yielded 6% (+0,5 ts/ha/12 mths) more sucrose than N12, and in trial RvtWg on an Inanda soil form, produced 21% (+1,3 ts/ha/12 mths) more than N12. Sucrose yield at trial Evt 13, also on an Inanda soil, was similar in both N12 and N16.

Hinterland region. Trials were sited on a range of soils that varied from a sandy Longlands form at Paddock, to an Inanda form at Upper Tongaat. Harvest age ranged from 12 to 23 months, with an average of 18,5 months, and age was an important factor in the performance of varieties. At Paddock (trials RvtCh), NCo376 yielded 4% more sucrose than N12 when cut at less than 15 months.(average 14.2 months). Harvested at 17 months and older (average 19 months), N12 yielded on average 10% (+0,9 ts/ha/12 mths) more sucrose than NCo376. A comparison with N16 showed similar results. At Upper Tongaat on an Inanda soil, N16 produced a substantially higher sucrose yield, (16%, +1,4 ts/ha/12 mths) higher than N12.

South Coast region. Three trials were sited on moderately shallow Glenrosa type soil and two were located in valley bottom areas. Harvest age averaged 14 months. The overall sucrose yield of NCo376 and N12 was similar with N16 marginally better.

North Coast region. Most trials were sited on shallow soils with low water holding capacity (Milkwood, Westleigh forms) and included a weak coastal sand. Harvesting was conducted at an average age of 13 months. The average sucrose yield of NCo376 and N12 over 36 harvest occasions at the Ottawa site (RvtCn) was the same, but N12 showed a slight yield advantage of 4% (+0,3 ts/ha/12 mths) on the coastal sands (RvtCs). In the trials in which N16 was included, the variety yielded an average of 8% (+0,5 ts/ha/12 mths) more than both NCo376 and N12.

Zululand region. With the exception of the trials sited at Gingindhlovu (Evt8,24) which were established on moderately productive grey loam soils (Swartland and Kroonstad forms) and the irrigated trial at Nkwalini (Evt17), the balance of trial results were derived from deep, red, clay soils (Shortlands, Hutton). The performance of N12 at Gingindhlovu was 3% better than NCo376, and at Mtunzini (RVT Cz) it was slightly worse. Its performance at the other sites was on average 10% (-1,1 ts/ha/12 mths) less than NCo376. Harvest age in this region averaged 12,7 months.

Umfolozi region. Trial Rvt20 was sited on a moderate coastal sand and N12 yielded 3% (0,3 ts/ha/12 mths) more than NCo376. The two other trials, which included N12, were conducted on highly productive alluvium soils on the Monzi flats and were harvested at 12,6 months. These conditions clearly did not suit N12, which produced on average 11% (-1,7 ts/ha/12 mths) less than NCo376 (Table 4).

Table 2. Age of harvest N12/NCo376: comparison of components of yield of N12 as % of NCo376.

Harvest age (months)	Mean all results				Coastal		Hinterland		Midlands	
	No. crops	pol % cane	tc/ha	ts/ha	No. crops	Mean ts/ha	No. crops	Mean ts/ha	No. crops	Mean ts/ha
10	11	104%	92%	98%	6	98%	0	no data	0	no data
11	36	102%	94%	94%	26	99%	0	no data	2	74%
12	42	102%	96%	98%	45	97%	3	96%	2	79%
13	24	100%	97%	99%	24	99%	1	96%	0	no data
14	23	103%	97%	98%	17	98%	3	94%	0	no data
15	13	100%	94%	94%	8	100%	4	88%	0	no data
16	10	102%	95%	98%	6	99%	4	98%	0	no data
17	12	109%	106%	114%	6	119%	4	110%	1	95%
18	11	104%	106%	109%	5	113%	5	110%	0	no data
19	7	105%	95%	101%	3	111%	1	112%	2	96%
20	8	103%	105%	108%	0	no data	4	104%	3	111%
21	4	108%	109%	117%	0	no data	1	114%	2	123%
22	6	107%	105%	109%	0	no data	2	112%	4	108%
23	16	109%	104%	112%	0	no data	3	105%	11	114%
24	6	106%	125%	128%	0	no data	0	no data	9	128%

Table 3. Age of harvest N12/N16: comparison of components of yield of N12 as % of N16.

Harvest age (months)	Mean all results				Coastal		Hinterland		Midlands	
	No. crops	pol % cane	tc/ha	ts/ha	No. crops	Mean ts/ha	No. crops	Mean ts/ha	No. crops	Mean ts/ha
10	5	102%	94%	100%	8	97%	0	no data	0	no data
11	20	100%	95%	94%	9	92%	1	92%	0	no data
12	23	97%	91%	90%	22	94%	3	85%	3	76%
13	9	95%	99%	94%	9	94%	0	no data	0	no data
14	10	97%	101%	89%	6	92%	3	77%	0	no data
15	9	99%	92%	91%	5	92%	3	84%	0	no data
16	6	98%	96%	94%	4	99%	3	91%	0	no data
17	3	111%	106%	96%	2	106%	0	no data	1	90%
18	3	101%	97%	98%	0	no data	2	105%	0	no data
19	6	102%	91%	94%	2	99%	1	110%	2	88%
20	4	103%	103%	106%	0	no data	4	107%	1	102%
21	4	104%	96%	100%	0	no data	1	86%	2	99%
22	5	104%	90%	94%	0	no data	2	100%	3	90%
23	12	107%	97%	103%	0	no data	3	113%	6	99%
24	3	107%	94%	101%	0	no data	0	no data	5	98%

Month of harvest

Figure 3 shows the sucrose content and sucrose yield of N12 compared with NCo376 when harvested through the season. Relative to NCo376, the sucrose content of N12 remained fairly constant throughout the season, but the sucrose yield data indicated that harvesting N12 during the first half of the season (May to July) was more advantageous than in the latter half.

Performance during periods of drought

Results of 31 low yielding crops of NCo376 and N12, harvested in trials conducted during the periods of drought in the mid-1980s and 1992-95, were compared. Cane yield in both varieties was similar and averaged 29 tc/ha/12 mths and 30 tc/ha/12 mths for NCo376 and N12 respectively. Average sucrose yield in NCo376 was 3 ts/ha/12 mths. Under the same

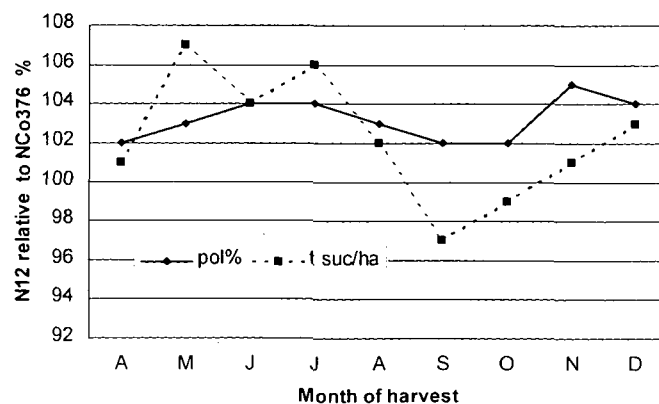


Figure 3. Month of harvest: comparison of components of N12 with NCo376 (100%).

Table 4. Comparison of mean sucrose yield of varieties by region (ts/ha/12 months).

Region	Trial	No. crops	Sucrose yield (ts/ha/12 mnths)			Sucrose yield as % of NCo376 (100%)			Average age (months)
			ts/ha/12m	Diff. (+/-) NCo376		NCo376	N12	N16	
			NCo376	N12	N16				
Midlands N	RvtMb 2-6	24	6,7	(+1,1)	n/a	100%	116%	n/a	22,4
Midlands N	Mb 3-4	*11	6,5	(+1,0)	(+1,3)	100%	115%	120%	22,9
Midlands N	Evt 13	3	7,4	(+0,7)	(+0,6)	100%	109%	108%	22,6
Midlands N	Evt 23	4	8,0	(-2,2)	(+0,1)	100%	73%	101%	11,6
Midlands S	Evt 9	3	7,7	(+0,4)	(+0,7)	100%	105%	109%	20,9
Midlands S	RvtWg	3	6,2	(+0,2)	(+1,5)	100%	103%	124%	22,4
Mean NCo376/N12		33	6,8	(+0,9)	n/a	100%	113%	n/a	22,0
Mean NCo376/N12/N16		*20	6,8	(+0,7)	(+1,2)	100%	111%	117%	22,2
Mean NCo376/N12/N16		4	8,0	(-2,2)	(+0,1)	100%	73%	101%	11,6
SC Hinterland	RvtCh 2-8	30	9,6	(+0,3)	n/a	100%	103%	n/a	17,3
SC Hinterland	RvtCh 3,5,8	*16	9,4	(+0,1)	(+0,3)	100%	101%	103%	17,6
SC Hinterland	Evt 3	7	8,8	(-0,1)	(-0,2)	100%	99%	98%	18,4
SC Hinterland	Evt 11	4	7,8	(+0,7)	(+0,8)	100%	109%	110%	19,6
NC Hinterland	Evt 4	6	10,3	(-0,6)	(+1,0)	100%	94%	110%	19,3
Mean NCo376/N12		47	9,6	(+0,2)	n/a	100%	102%	n/a	18,7
Mean NCo376/N12/N16		*33	9,3	0	(+0,3)	100%	100%	104%	18,2
S Coast	Evt 18	9	7,3	(-0,2)	(-0,4)	100%	97%	95%	14,8
S Coast	Evt 1	7	10,7	(+0,1)	(+0,6)	100%	101%	106%	12,0
S Coast	Evt 6	3	13,2	(-0,4)	(+0,5)	100%	97%	104%	12,3
S Coast	Evt 16	4	5,8	(+0,2)	(+1,0)	100%	103%	117%	14,3
S Coast	Evt 22	3	10,7	(+1,4)	(+0,3)	100%	113%	103%	14,7
Mean NCo376/N12/N16		26	9,1	(+0,1)	(+0,2)	100%	101%	103%	14,0
N Coast	RvtCn 2-10	36	6,8	0	n/a	100%	100%	n/a	13,7
N Coast	RvtCn 7,9,10	*11	8,1	(-0,1)	(+0,9)	100%	99%	111%	12,2
N Coast	RvtCs 2-10	22	6,9	(+0,3)	n/a	100%	104%	n/a	14,0
N Coast	RvtCs 9,10	*3	5,6	(+0,1)	0	100%	102%	100%	15,2
N Coast	Rvt 21	6	5,5	0	(+0,5)	100%	100%	109%	13,0
N Coast	Rvt 18	4	8,5	(+0,4)	(+0,1)	100%	105%	101%	14,0
Mean NCo376/N12		68	6,8	(+0,1)	n/a	100%	102%	n/a	13,6
Mean NCo376/N12/N16		*24	7,2	0	(+0,5)	100%	100%	108%	13,1
Zululand	Evt 8	5	6,0	(+0,1)	n/a	100%	102%	n/a	14,0
Zululand	Evt 24	3	9,9	(+0,3)	(+1,1)	100%	103%	111%	12,3
Zululand	RvtCz 2-7	27	9,0	(-0,2)	n/a	100%	98%	n/a	13,3
Zululand	RvtCz 3,6	*10	10,7	(-1,1)	(-0,2)	100%	90%	98%	13,6
Zululand	Evt 17	4	11,0	(-1,0)	(+0,6)	100%	91%	105%	12,2
Zululand	Evt 19	5	13,4	(-1,3)	(-0,4)	100%	90%	97%	11,8
Mean NCo376/N12		44	9,4	(-0,3)	n/a	100%	97%	n/a	12,9
Mean NCo376/N12/N16		22	11,3	(-0,9)	(+0,1)	100%	92%	101%	12,5
Umfolozi	Rvt 19	4	12,5	(-0,8)	n/a	100%	94%	n/a	13,2
Umfolozi	Rvt 20	7	12,0	(+0,3)	n/a	100%	103%	n/a	12,3
Umfolozi	Evt 21	4	16,2	(-2,6)	n/a	100%	84%	n/a	12,4
Mean NCo376/N12		15	13,3	(-0,8)	n/a	100%	94%	n/a	12,6

circumstances N12 yielded on average 14% (+0,45 ts/ha/12 mths) more than NCo376. Figure 4 shows the comparison of N12 with NCo376 under drought conditions.

Variety N16 was included in 15 such comparisons with NCo376 and N12. Cane yield averaged 28, 29 and 31 tc/ha/12 mths in NCo376, N12 and N16 respectively. Average sucrose yield of NCo376 was 3 ts/ha/12 mths. In this set of results N12 yielded 10% (+0,28 ts/ha/12 mths) and N16 produced 13% (+0,37 ts/ha/12 mths) more sucrose than NCo376.

Generally strong regrowth was recorded in N12 and N16 following the drought. Regrowth in NCo376 in some trials conducted on shallow clay soils was extremely poor and the trials were subsequently terminated.

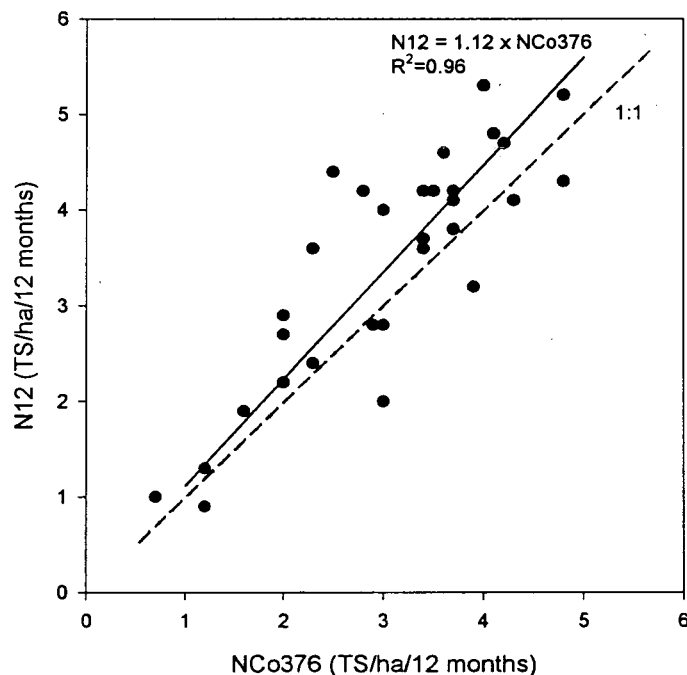


Figure 4. Comparison of N12 with NCo376 in droughted conditions.

Performance of N12 relative to NCo376 in plant and ratoon crop stages

The results from varieties NCo376 and N12 in the various crop stages were evaluated to determine whether differences in the plant crop stage persisted in subsequent ratoons. The average sucrose yield of all plant crops of NCo376 and N12 was similar, but the age at which the crops were harvested was an overriding factor. Plant crops of N12 cut at 12 to 15 months produced a sucrose yield which was on average 6% less than NCo376. Harvested at older than 17 months, the yield advantage of N12 relative to NCo376 increased thereafter at the rate of 1,6% per month. In ratoons 1 to 3, the age of harvest remained a factor, but its effect was slightly less than in the plant crop. Crops of NCo376 and N12 were, on average, equal at 15-16 months of age, and the sucrose yield of N12 increased thereafter at a rate of 2,6% per month relative to NCo376. There were insufficient data from the fourth ratoon onwards, but indications were that the older crops of N12 and NCo376 yielded in a similar pattern to the plant crop.

Conclusions

These results have confirmed that, when the performance of N12 is evaluated, age at harvest is an important factor. Variety N12 is clearly better suited to the high altitude regions where harvesting is conducted on a two year cycle. The variety has proved very productive under these circumstances.

The average of all results from N12 harvested in the midlands, and when cut at a mean age of 22 months, showed that the variety produced 13% (+0,9 ts/ha/12 mths) more sucrose yield than NCo376. Annually cut N12 in the midlands gave very poor results.

Results from trials conducted in the north and south coast regions, harvested at a mean age of 13 to 14 months, showed that on average the yields of N12 were marginally better than NCo376. N12 produced an average of 3% more sucrose than NCo376 on the weak coastal sands.

It is on the more favourable sites on good soils in the Zululand/Umfolozzi areas, where harvesting is conducted at 12 months of age, that N12 is clearly at a disadvantage, producing on average 10% (-1,3 ts/ha/12 mths) less than NCo376.

The average of all trial data showed that the sucrose content in N12 was 3% higher than in NCo376 and that cane yield was on average 1% less.

N16 proved to be more productive than N12 in a number of situations and produced a similar sucrose yield to N12 in drought conditions. The sucrose content of N12, averaged from all trial data, was 1% higher than N16; but N16 produced, on average, 5% more cane yield. On humic soils in the midlands/hinterland area, N16 produced an average of 15% (1,3 ts/ha/12 mths) more sucrose than NCo376 in two trials, while in a third trial, yields in both varieties were similar.

N12 has been shown to be a very useful and reliable variety that has yielded well when cut at the correct harvest age. It is a hardy variety, and has grown well under adverse growing conditions such as weak sands, poor drainage and shallow soils. Relative to NCo376, the performance of N12 during periods of drought and its recovery thereafter, have been superior.

Acknowledgements

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APPENDIX 1
Comparison of means of components of yield of NCo376, N12 and N16.

Region	Trial code	Average age	No. crops	Average Pol % cane			Average tc/ha/12 mths			Average ts/ha/12 mths		
				NCo376	N12	N16	NCo376	N12	N16	NCo376	N12	N16
Midlands N	Rvtmb/2	22	6	12,8	13,6	0	56	65	0	7,2	8,8	0
Midlands N	Rvtmb/3	21	5	12,4	13,1	13,3	47	51	53	6,5	7,5	7,6
Midlands N	Rvtmb/4	24	4	13,4	14,6	14,0	54	58	61	7,2	8,1	8,5
Midlands N	Rvtmb/4b	23	2	13,0	13,5	13,5	53	60	64	6,8	8,1	8,7
Midlands N	Rvtmb/5	23	4	12,9	13,7	0	53	60	0	6,9	8,2	0
Midlands N	Rvtmb/6	22	3	12,9	13,5	0	49	53	0	6,2	6,8	0
Midlands N	Evt 23	12	3	7,1	6,3	6,8	113	93	120	8,0	5,8	8,3
Midlands N	Evt 13	23	3	13,7	14,5	13,7	54	57	58	7,4	8,1	8,0
Midlands S	Evt 9	21	3	13,6	14,6	14,2	54	55	57	7,2	7,8	8,0
Midlands S	Rvtwg	22	3	12,8	13,8	12,7	49	47	60	6,1	6,3	7,5
SC Hinterland	Rvtch/2	17	6	13,8	14,2	0	80	85	0	11,0	12,0	0
SC Hinterland	Rvtch/3	15	7	13,3	13,4	13,7	80	79	84	10,5	10,6	11,5
SC Hinterland	Rvtch/4	18	5	14,2	14,4	0	67	70	0	9,5	10,1	0
SC Hinterland	Rvtch/5	17	5	13,1	13,5	13,2	62	62	58	8,4	8,7	7,9
SC Hinterland	Rvtch/6	15	3	13,2	13,6	0	55	56	0	7,5	7,8	0
SC Hinterland	Rvtch/8	20	1	13,5	13,6	13,4	70	61	73	9,4	8,4	9,7
SC Hinterland	Evt 3	18	7	14,3	14,9	14,6	60	58	57	8,6	8,7	8,3
SC Hinterland	Evt 11	20	4	14,1	14,3	13,9	57	61	63	8,0	8,7	8,6
NC Hinterland	Evt 4	19	6	13,3	14,7	13,6	76	65	81	10,2	9,7	11,1
S Coast	Evt 18	15	9	11,6	12,7	11,8	58	57	54	6,7	6,6	6,4
S Coast	Evt 1	12	7	12,9	13,1	13,1	83	81	86	10,7	10,7	11,3
S Coast	Evt 6	12	3	13,7	13,2	13,5	98	98	102	13,2	12,8	13,7
S Coast	Evt 16	14	4	11,6	11,9	12,0	44	45	49	5,4	5,6	6,4
S Coast	Evt 22	15	3	12,9	12,7	13,3	81	94	82	10,4	11,8	10,9
N Coast	Rvtcn 2	16	6	10,3	11,5	0	44	44	0	4,8	5,2	0
N Coast	Rvtcn 4	15	10	11,2	11,9	0	56	52	0	6,5	65,4	0
N Coast	Rvtcn 5	14	9	10,2	10,8	0	64	62	0	6,6	6,8	0
N Coast	Rvtcn 7	12	5	10,4	11,1	10,8	71	67	74	7,8	7,8	8,4
N Coast	Rvtcn 9	14	2	9,5	8,9	9,6	47	52	59	4,7	5,0	6,3
N Coast	Rvtcn 10	12	3	13,8	14,3	14,3	68	68	74	9,7	9,8	10,7
N Coast	Rvtcs 2	14	9	13,7	14,0	0	57	61	0	7,8	8,6	0
N Coast	Rvtcs 5	17	2	13,8	14,4	0	26	31	0	3,5	4,4	0
N Coast	Rvtcs 6	12	4	13,6	13,6	0	68	64	0	9,2	8,6	0
N Coast	Rvtcs 7	12	2	13,9	13,4	0	60	59	0	8,3	7,9	0
N Coast	Rvtcs 8	16	2	9,6	10,6	0	20	21	0	2,1	2,4	0
N Coast	Rvtcs 9	15	2	12,8	12,5	12,3	41	38	33	5,2	4,8	4,0
N Coast	Rvtcs 10	13	1	12,4	10,8	12,7	55	78	75	6,3	7,7	8,7
N Coast	Rvt 21	13	6	12,9	12,8	13,1	43	43	46	5,6	5,5	6,1
N Coast	Rvt 18	15	5	12,6	13,1	12,4	63	69	61	8,1	9,0	7,7
Zululand	Evt 8	14	5	11,9	12,5	0	50	50	0	5,9	6,2	0
Zululand	Rvt 24	12	3	14,1	14,2	14,6	70	73	76	9,9	10,3	11,1
Zululand	Rvtcz 2	15	4	11,3	12,0	0	58	60	0	6,6	7,4	0
Zululand	Rvtcz 3	14	6	13,1	13,5	0	71	61	0	9,3	8,2	0
Zululand	Rvtcz 4	12	8	11,0	12,0	0	65	66	0	7,3	8,1	0
Zululand	Rvtcz 5	14	5	12,2	12,9	0	78	72	0	9,5	9,2	0
Zululand	Rvtcz 6	14	3	12,7	13,2	12,6	90	80	85	11,5	10,5	10,7
Zululand	Rvtcz 7	12	1	12,1	12,7	11,9	117	103	101	14,1	13,0	12,1
Zululand	Evt 17	12	4	14,0	14,4	14,1	78	70	82	11,1	10,1	11,7
Zululand	Evt 19	12	5	13,5	13,4	13,3	95	86	93	13,4	12,1	13,0
Umfoloji	Rvt 19	13	4	13,6	13,6	0	93	87	0	12,5	11,8	0
Umfoloji	Rvt 20	12	7	14,0	14,8	0	86	84	0	12,0	12,3	0
Umfoloji	Evt 21	12	4	11,3	10,4	0	145	129	0	16,3	13,5	0