COMPONENT 1

ESTABLISHING SEED CANE NURSERIES ON SMALL HOLDINGS

Component Leader: Malcolm Bennett-Easy
Sugar Industry Research Institute
Kendal Road, Mandeville
Jamaica

OBJECTIVES

The main objectives of the Nursery Cane project were to:

1. improve viability and sustainability of the smallholder in sugar cane by improving access to new improved cane varieties
2. expedite the delivery of improved high yielding, disease resistant varieties to growers on small holdings
3. facilitate more rapid multiplication and distribution of newer varieties across the industry
4. ensure that seed cane supplied to growers was obtained from pure stand nurseries

Background

Sugar cane varieties are the foundation on which the Jamaican industry is built. At any given time there may be thousands of varieties at various stages of development and in commercial production. Typically, there are some two dozen varieties achieving the status of being grown on more than 1% of cane area. A new variety comes through the 10-12 year testing process and is released to the industry every 3-4 years. The new variety brings with it the potential for productivity increases, pest and disease resistance and various desirable agronomic traits deemed suitable for increased performance thus enhancing farm viability.

Traditionally, the release and multiplication of new varieties occurred exclusively on major estates. Small cane growers usually encountered difficulties in immediately accessing these newer varieties. They were often left to the expedience of continuing to grow older varieties that were declining in productivity until the newer varieties were grown in abundance. The CFC nursery cane project was specifically designed to change those circumstances and place the small cane grower on an equal footing with major estates. It was felt that productivity gains from use of newer varieties would go some way towards improving the smallholders' viability.

Varieties for the Jamaican industry are bred mainly by the West Indies Central Sugar Cane Breeding Station (WICSCBS), located in Barbados but jointly funded by Jamaica and other members of the Sugar Association of the Caribbean (SAC). Progeny of breeding in the form of true seed (or fuzz) is sent annually to the Sugar Industry Research Institute (SIRI) for local evaluation for the Jamaican industry. SIRI also occasionally conducts its own small breeding initiatives. This project coincided with the release of a very promising high yielding variety, J9501, which emerged from SIRI's crossing programme. This variety, along with others such as BJ8532, BJ8534, BJ82156, BJ7839 and BJ78100 which originated from the WICSCBS were to form the main plank of this nursery cane project.

METHOD

The approach employed by SIRI in establishing Component 1 nurseries was as follows:

SIRI Extension Agronomists identified reliable farmers with the aptitude and track record in cane growing and an attitude of cooperation which involved closely following recommendations. Land preparation was done under the supervision of SIRI Extension personnel.

The component leader then provided the recommended varieties for establishment of the nurseries, often between 1 and 4 ha in size.

The main sources of varieties for the project were Primary Nurseries, previously established on the SIRI experiment farm

Fig. 1: J9501, Variety bred by SIRI which featured prominently in CFC nursery project

at Springfield in the parish of Clarendon and on major estates. From these locations, SIRI, in its capacity as PEA, was able to establish Secondary Nurseries on small holdings across the industry. Nurseries were grown and maintained under specific guidelines developed by the PEA, Exhibit1. Once the PEA deemed the material to be satisfactorily grown and suitable for use as seed cane, SIRI's Extension agronomists then assisted the growers in finding markets. Participants were obliged to return to the project an equivalent quantity of seed cane as received to establish plots. Some growers nonetheless displayed reluctance to return the appropriate quantity of seed cane. Seed cane made available to the PEA in this way was then used to establish other plots. First preference for sale of seed cane from these nurseries was to other smallholders in that particular cane farming district. When that need was satisfied then the remaining seed was made available to whoever was in the process of cane planting and was prepared to purchase planting material.

With the focus being on smallholders, the CFC project ensured that such farms were in the forefront of propagation of the new elite cultivars available to the industry.

Accomplishment

During the course of the project Secondary nurseries totaling 79.03ha were established. This fell short of the original target which was set with greater expectation of farmer cooperation than encountered and without anticipation of the onslaught of hurricanes. For instance, it was expected that farmers could be relied on to inject much higher levels of inputs than turned out to be the case. More resources from the Fund were therefore utilised in plot preparation and maintenance than planned. This limited the number of plots that could be set up.

Nurseries established yielded approximately 2768 tonnes seed cane which would have gone a long way in complementing seed cane from other sources for the 2007-2008 replanting seasons. The value of this seed cane is calculated to be approximately US$81,500. An important noticeable feature was that both agronomic and cultural practices on farms where nursery projects were established were improved over previous years and this resulted in increased levels of productivity and potential earnings.

Fig. 2: Dibbled top planting of CFC nursery ensures good field population on smallholders plot

The enthusiasm for cane growing was noticeably spurred in farmers who visited these plots on field days. Although farmers now have greater access to elite varieties they have since been making increasing requests for expansion of the project.

Major estates and farms also became indirect beneficiaries of seed cane produced by smallholders under the programme, although they were not the prime targets as the CFC project tended to fill a void in nursery cane production for the industry as a whole.

The elite varieties multiplied were J9501, BJ78100, BJ8532, BJ8534, BJ7938 and BJ82156

The nurseries planted during the 3-year period, are presented in Table1. Although considerable effort was made to ensure that nursery plots were

AGREEMENT for DEVELOPING SEED CANE NURSERY

Between the GROWER and the SUGAR INDUSTRY RESEARCH INSTITUTE (SIRI)

under the CFC PROGRAMME

I/We_____(hereafter called the grower) located at _____in the parish of_____do hereby agree to the following terms and conditions for participating in a seed cane nursery project.

TERMS AND CONDITIONS

1. The grower agrees to allocate _____hectares of land deemed suitable for seed cane growing upon inspection by the grower and SIRI Extension Agent.
2. The grower agrees to prepare land, ensuring adequate tilth, to the creation of furrows. Furrows may be drawn in a narrow row format to maximize production
3. The grower agrees to plant only varieties supplied by SIRI and where supplying is necessary, only seed of the same variety may be used
4. The grower agrees to provide fertilizer, herbicides and other essential inputs necessary for proper field establishment and cane growth
5. The grower agrees to maintain a very high standard of field husbandry for the entire life of the nursery
6. The grower agrees to allow the agents of SIRI free access to the nursery
7. The grower will rogue stools of varieties not true to type so as to maintain varietal purity
8. Cutting of seed cane will commence after 6-7 months
9. The grower agrees to cut and make available to SIRI an equal quantity of seed cane as received in establishing his/her nursery.

The grower will make provision to sell the remainder of seed cane or use the seed cane in his/her own planting programme.

The grower will sell ratoon nursery seed cane at 6-7 months.

The certification of the nursery will expire after 4th harvest.

Grower: _____

SIRI: _____

Date: _____

This project is being financed by the Common Fund for Commodities, an intergovernmental financial institution established within the framework of the United Nations, headquartered in Amsterdam, the Netherlands.

Exhibit 1: Grower Contract with PEA for Participating in Nursery Cane Project

equitably planted in all five agro-ecological areas a higher number was planted in the irrigated and wet west areas as these were the areas most actively engaged in replanting. In the Wet East ecological zone, for instance, there was almost no replanting activity among farmers.

Challenges Encountered

Implementation of this component of the Project was affected by several challenges namely:

1. Inability of many growers to adequately finance essential operations for proper maintenance and development of plots. This was an overriding obstacle to achieving the projected targets in 2007 especially.
2. Drought during the early part of 2005 and 2006 impeded land preparation and planting
3. Established nurseries were setback (stalk breakage, lodging, severe scouring) by hurricanes in 2004 and 2006
4. Lack of appropriate field equipment affecting land preparation in some regions

Fig.3: CFC seed cane nursery, Rhymesbury, Clarendon

Fig. 4: CFC Seed Cane Nursery, Ebony Park, Clarendon

Fig. 5: Four month old seed cane nursery, Westmoreland

Table 1: Growers name, location, plot size, variety and date planted 2004-2007

(Yield of seed cane estimated at 7-8 months). Factory processed canes are actual yield.

Grower	District	Plot size (ha)	Variety	Date Planted	End Use	Estim. Yield (tc/ha)
Eason	Shrewsbury	1	BJ8532	May (05)	Seed cane	40
Jackson	Grange Hill	2.4	BJ8532	June (05)	Sugar processing	77
Raymond	Haynes	2	BJ78100	April (05)	Seed cane	80
Lieba	Chapleton	1	BJ78100	May (05)	Seed cane	40
S Williams	Upper Clarendon	1	BJ78100	May (05)	Seed cane	42
E. Clarke	Upper Clarendon	1	BJ78100	May (05)	Seed cane	40
A. Rose	Upper Clarendon	1	BJ78100	May (05)	Sugar processing	44
K. Salabie	Burnt Savannah	2	BJ8532	June (05)	Sugar processing	78
Suberon	Delveland	0.5	BJ8532	June (05)	Sugar processing	68
Retreat	Retreat	1	BJ8532	May (05)	Sugar processing	64
D .Glashen	Content	0.75	J9501	June (05)	Sugar processing	66
A. Sangster	Galloway	1	BJ8532	May (05)	Sugar processing	74
L Hanna	Four Paths	4.05	BJ8532	Jan (04)	Seed Cane	79
Dr Baugh	Content	2.3	J9501	Jan (04)	Sugar processing	75
K Evans	Rhymesbury	2.83	BJ8532	Jan (04)	Sugar processing	72
Ebony Park	Ebony Park	2.40	BJ8532	Jan (04)	Sugar processing	78
J Logan	Tollgate	0.80	BJ78100	May (07)	Seed cane	56
Sybron	Content	0.45	BJ8532	Jan (04)	Seed cane	18
S Morgan	Pennant	1.2	BJ78100	Feb (04)	Seed cane	48
O Golding	Chapleton	1.2	J9501	Feb (04)	Seed cane	50
Advance Farm	Hampton (Tilston)	2.5	BJ8532	Feb (04)	Factory processed	75
D. Stanford	Lakes Pen	4.0	BJ8532	Mar (04)	Seed cane	120
Curtis Ext farmer	March Pen	2.5	BJ78100	Mar (04)	Factoy processed	65
J. Plummer	Content	8.3	BJ78100 BJ8252	Mar (04)	Factoy processed	66
Eda Barham	Bogue	1.2	BJ8252	April (04)	Factory processed	74
Box	Barton Isle	4.0	BJ8252 BJ78100	May (04)	Factory processed	70
D Stanley	Braes River	2.0	BJ82102	June (04)	Factory processed	60
Mark Watson	Bogue	1.2	BJ82102	June (04)	Factory processed	60
Lennie Rhoden	Sheffield	1.8	BJ82156 BJ78100	June (04)	Factory processed	70
D. McFarlane	Burnt Savannah	1.8	BJ78100 BJ82156	June (04)	Factory processed	70
Robinson	Golden Grove	1.0	BJ8532	June (04)	Factory processed	74
Retreat	Retreat	5.5	BJ8252	June (04)	Factory processed	72
Hubert Baker	Braes River	1.0	J9501	June (05)	Factory processed	63
T. Moo-Pen	Bogue	0.5	BJ8534	Feb (05)	Factory processed	77
W. Green	Bogue	0.75	BJ78100	Feb (06)	Factory processed	68

Table 1: Growers name, location, plot size, variety and date planted 2004-2007 (contd.)						
Lebert Forbes	Elim	0.75	BJ8532	Feb (06)	Factory processed	63
C Smith	Elim	0.75	BJ78100	Feb (06)	Factory processed	66
C Hinds	Content	2.0	BJ8534	Mar (06)	Factory processed	80
Advanced Farm	Tilston	1	BJ8534	Mar (06)	Seed cane	50
Irving Clarke	Pennant	0.75	BJ78100	April (06)	Seed cane	35
Bimbo Rodriquez	Elim	1	BJ78100	April (06)	Factory processed	65
V. Palmer	Elim	2	BJ78100	June (06)	Stood over	80
Total	79.03					
NB: Yields computed are for years 2005 and 2006. The yields for 2007 were not available for this report.						

The estimated seed cane production from 79.03ha planted is 2768 tonnes with an estimated value of $5,536,000.

Table 2: Secondary Nurseries planted in different agro ecological zones for years 1, 2 & 3				
Ecological Zone	Year 1 Area Planted (ha)	Year 2 Area Planted (ha)	Year 3 Area Planted (ha)	Total Area Planted (ha)
Wet West	17.50	9.40	5.25	32.15
Irrigated	20.50	18.33	3.55	42.38
Wet East	1	0	0	1
Dry north coast	2.5	0	1	3.50
Total	41.5	27.73	9.8	79.03

The irrigated area accounted for the highest number of plots planted over the three-year period while there was hardly any replanting activity outside the major estate in the wet East, Table 2. Seed cane generated by the nurseries had a considerable impact on the supply of seed cane available to Estates and farmers. However, the anticipated quantity was not used for planting, because of low replanting levels in the industry over the duration of the project. Instead, much was taken to maturity and processed for sugar in factories. There was a marked increase in productivity levels (tc/ha) on all project farms as reflected in Table 3. The increased yield achieved was attributed largely to improvements in agronomic and cultural practices that were influenced by activities in the nurseries.

Table 3: Productivity before and after establishment of nurseries on participating farms in each agro-ecological area			
Agro-ecological area (Project farms)	Yield tc/ha before installing project	Yield tc/ha after installing project	% change in Yield
Wet West	62	74	19
Irrigated	56	67	19
Wet East	75	78	4
Dry North Coast	65	75	15

Lessons learnt

- An effort to boost seed cane production comes to naught unless there is a complementary coordinated cane planting programme.
- Sugar cane growers will respond positively to programmes that have the potential to improve productivity on their holdings.
- A more vigorous and stringent approach should be pursued to ensure that growers adhere to the agreement into which they enter with the PEA.

- It is essential to establish a close working relationship between growers and technocrats so as to facilitate the transfer of new technologies.
- If adequate financial assistance is made available to growers, on a timely basis and properly monitored, significant increases in production and productivity could be realized

CONCLUSIONS

- The establishment of these variety nurseries facilitated a more equitable distribution of new varieties amongst small holdings
- Participating growers, for the most part, realized improvements in productivity of between 15-20%.
- Improvements in agronomic and cultural practices were realized on some farms geographically contiguous to the projects.
- Increased quantities of seed cane available for the replanting programme were achieved even though most of it ended up being factory processed. ☆