SUGAR CANE

VOL. 22 No. 3 August 2004

PUBLISHED BY THE SUGAR INDUSTRY RESEARCH INSTITUTE, SUGAR INDUSTRY AUTHORITY, JAMAICA

BOOSTING SMALL FARM PRODUCTIVITY

The CFC Project

by Trevor Falloon

T. Falloon

In 2003 the Sugar Industry Research Institute (SIRI) signed an agreement with the Common Fund for Commodities (CFC) for a project titled "Enhancing the Viability and Competitiveness of Caribbean Sugar Industries."

WHAT IS THE CFC?

The CFC is a relatively new organisation under the umbrella of the United Nations. It is an intergovernmental institution formed in 1989 with its headquarters in Amsterdam, the Netherlands. The CFC was set up to provide assistance to commodity producers. This agency makes available loans or grants for projects approved by its Board to assist commodity producers to become more efficient. Commodities covered include a range of crops such as sugar cane, banana, coffee, cocoa, coconut, sorghum etc and certain minerals such as lead, zinc, copper and nickel.

GAINING ASSISTANCE

Jamaica is among the 104 countries that make up the CFC. In the Caribbean, only one other country, Trinidad & Tobago, has membership in the organisation. The project, which is to be implemented in Jamaica and Trinidad, was first screened by the International Sugar Organisation (ISO) before being sent to the CFC – an essential requirement for any sugar cane project to be considered.

THE PROJECT

Scheduled to last three years, the project aims to enhance the competitiveness of the industries by using improved technology to increase income to farmers (especially smallholders). Project components include:

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Cane grower, Mr Lynberth Sybron stands before his secondary nursery of BJ8532 in Mid-Clarendon

CODE OF PRACTICE FOR AGROCHEMICALS

by M. Edmund Lewis

M. Edmund Lewis

The Jamaican Sugar Industry is now well advanced in developing a draft Environmental Code of Practice. This will eventually cover all aspects of cane production and processing and is a purely voluntary tool designed to make the living environment safe and the industry sustainable.

Sugar cane farming is second only to livestock in its occupation of arable land in Jamaica. As custodians of such significant tracts of land, the industry has a special obligation to ensure, not only that this land is used productively, but that it will remain a potentially viable source of livelihood for future generations.

CODE OF PRACTICE

Coverage

The Environmental Code of Practice, as far as it impacts on sugar cane agriculture, addresses virtually all aspects of cane growing and harvesting including issues of soil management to reduce degradation and irrigation practices which can adversely affect soil salinity or result in runoff of fertilizers and other chemicals to pollute streams or the sea etc. It is the matter of agricultural chemical storage that will be discussed in this issue.

By their very nature, agricultural chemicals demand special attention as they are potentially among the most environmentally hazardous inputs used in sugar cane farming. Herbicides and insecticides are poisons designed to kill plant and insect life, respectively. Ingestion, inhalation and even skin contamination, at sufficient concentration, can be fatal to humans and livestock. If allowed to percolate into water sources, results can be disastrous to fish and other users. Such events may be relatively rare in sugar cane farming, but good sense dictates that precautions be taken against the possibility.

In due course, Codes of Practice for the following aspects of the management of agrochemicals will be outlined:

1. Storage
2. Aerial Spraying
3. Measuring, Mixing and Application of Pesticides
4. Calibrating and Maintenance of Equipment
5. Handling of Agrochemicals
6. Maintenance of Spray Equipment
7. Management Control

In this issue, the first of the Codes of Practice, Storage, will be presented. Look for other Codes in subsequent issues of Sugar Cane.

Storage of Agro Chemicals

The methods of storage for all agro chemicals are the same irrespective of category [fungicide, insecticide, growth regulators, herbicide, fertiliser.]

1. Store in original containers, well labelled.
2. Do not stock on the floor. Instead, pack on shelves designed to allow for maximum ventilation. Shelves should not be against a wall.
3. Room should have adequate windows to allow for vapour/fumes to exit.
4. Avoid too high temperatures in storeroom as this fosters breakdown of many chemicals. Some chemicals may volatilise at high temperatures.
5. Exclude moisture, as this predisposes powders and granules to dissolve and lose quality. Rainproof roofs and windows reduce moisture levels, and extractor fans can help to facilitate this.
6. Keep containers tightly closed to avoid reaction with air or water vapour and subsequent loss of quality.
7. Keep records of intake, disbursement, stock balance, and expiry dates of all chemicals in storage.
8. Keep older stock to the front where they can be used first as they near their expiration date, and newer ones which have longer expiration dates to the back
9. Clear out/reorganise store room at the end of each cropping season, and dispose of old stock appropriately.
10. Store clerks should have an enclosed office or work area, away from the storage area of the chemicals.
11. Appropriate dispersal (weighing, measuring) of chemicals must be in place to facilitate accurate record keeping by the store clerk. Scales, measuring cylinders or cups, along with scoops and sealable containers must be provided for use by the store clerk.
12. Provide facilities to cleanse, dry, and otherwise store equipment available for use by clerk in the execution of routine duties.
13. Farm tools, machinery, planting materials, food (feed), and other gadgets must not be stored in the same compartment as agro chemicals.
14. Keep booklets or pamphlets on each chemical for easy reference.

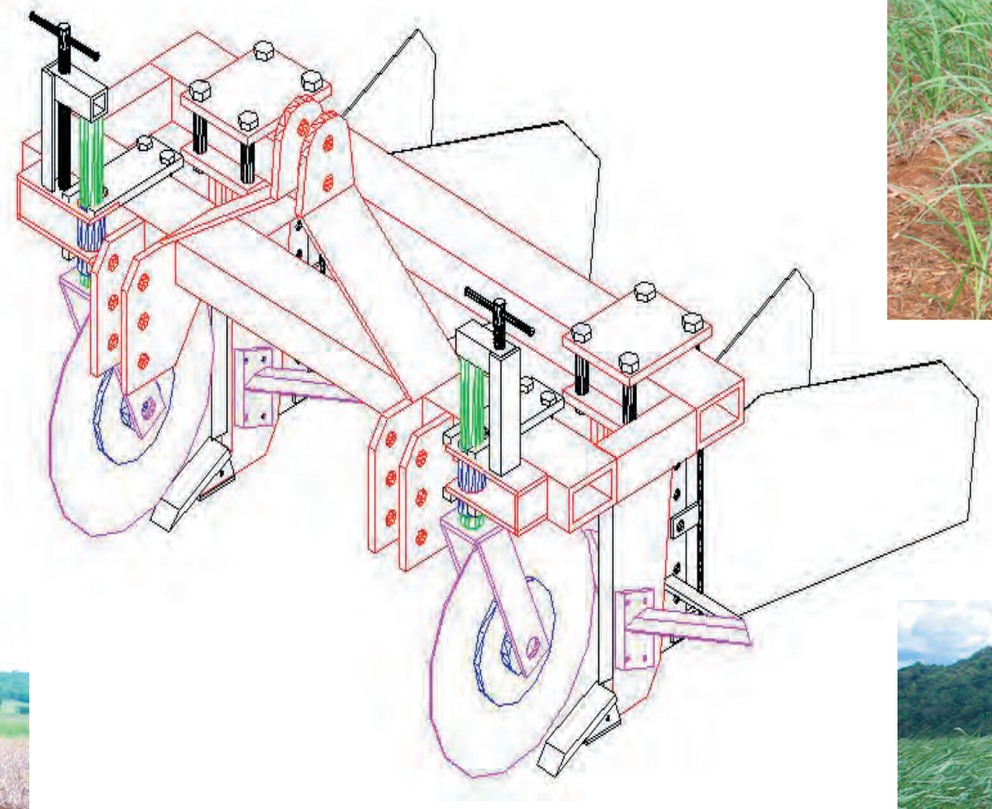
Variety Recommendations - 2004

by M. Bennett-Easy

Cane-growing Area	Harvesting Period	Light Soils	Clay Loams	Clays	Cane-growing Area	Harvesting Period	Light Soils	Clay Loams	Clays
Westmoreland & Hanover	Early	BJ7355	BJ7452	BJ7465	St Thomas	Early	N/A	BJ7314	BJ7465
		BJ7465	BJ7015	BJ7452				BJ7355	BJ7355
		BJ7015	BJ7355	BJ8252				BJ7452	BJ7452
		BJ7314		BJ7355				BJ82156	BJ7627
				BJ7015				BJ7627	BJ7015
	Middle	BJ7504	BJ7355	BJ7504		Middle	BJ7355	BJ7627	BJ7627
		BJ7015	BJ7627	BJ7015			BJ82119	BJ7355	BJ7355
		BJ7355	BJ7015	BJ7938			BJ8207	BJ82119	BJ8207
			BJ7938	BJ82119			BJ82156	BJ7627	BJ7015
			BJ82119	BJ7627					BJ82119
	Late	BJ7627	BJ7627	BJ82119		Late	BJ7627	BJ7627	BJ7627
			BJ82119	BJ7627			BJ82119	BJ82119	BJ82119
Irrigated Clarendon & St. Catherine Plain	Early	BJ7465	BJ7015	BJ7465	Trelawny St. James & St. Ann	Early	BJ7465	BJ82156	BJ7465
		BJ7015	BJ7355	BJ8252			BJ82119	BJ7015	BJ82156
		BJ7355	BJ7627	BJ7355			BJ82156	BJ7504	BJ7504
		BJ7938	BJ82102	BJ82119			BJ7504	BJ7465	BJ7465
		BJ82102	BJ7465	BJ82102			BJ7465	BJ8252	
		BJ7627	BJ8252	BJ8252			BJ8252	BJ82102	
		BJ7262		UCW5465					
				BJ7015		Middle	BJ82119	BJ7627	BJ7627
	Middle	BJ82119	BJ82119	BJ7504			BJ7504	BJ82156	BJ7504
		BJ7548	BJ7548	BJ7627			BJ82156	BJ82119	BJ82156
		BJ82102	BJ82102	BJ7548					BJ7015
		BJ7555	BJ7355	BJ82102					
		BJ78100	BJ78100	BJ7355		Late	BJ7627	BJ7627	BJ7627
			BJ8252	BJ8252					BJ7015
	Late	BJ7627	BJ7627	BJ7627					
Upper St. Catherine & Upper Clarendon	Early	BJ7555	BJ7555	BJ7555	St. Elizabeth	Early	BJ7015	BJ7015	BJ7015
		BJ7015	BJ7015	BJ7465			BJ7314	BJ82102	BJ82102
		BJ7465	BJ82156	BJ7015			BJ82102	BJ7465	BJ7465
		BJ7314	BJ7314	BJ7314		Middle	BJ7252	BJ7627	BJ7627
		BJ82156	BJ7627	BJ7627			BJ82119	BJ7465	BJ7465
		BJ7627	BJ7504	BJ7504			BJ82102	BJ8252	BJ7938
	Middle	BJ7555	BJ7555	BJ7555			BJ7465		BJ8252
		BJ7465	BJ7015	BJ7462			BJ8252		
		BJ82119	BJ82119	BJ82119			BJ7627		
		BJ7262	BJ7262	BJ82156			BJ82156		
		BJ82156	BJ82156			Late	BJ7465	BJ7627	BJ7465
	Late	BJ7627	BJ7627	BJ7627			BJ7627	BJ7465	BJ7627
							BJ7314	BJ7314	BJ7314

REDUCED TILLAGE AT LONG POND

Cane dying after Roundup application



SIRI's Reduced Tillage Machine (RTM)

Canes germinate as old canes die

Seedbed prepared by 2 passes of RTM in the inter-row space

Cane growth after 5 months

Continuing Search for Ratoon Stunting Disease

by

Trevor Falloon & Errol Henry

Books up until the 1950's had Jamaica listed as one of the many countries worldwide with ratoon stunting disease (RSD). Yet, a number of studies carried out since then have failed to confirm this. The major industry-wide survey, conducted by Dr Michael Davis of the University of Florida in 1987 using his then newly developed method known as the fluorescent antibody staining technique, failed to detect symptoms in any of 61 fields sampled.

However, a recent survey at the start of the 2004 crop, carried out on 64 fields, detected the organism associated with RSD in nine. This last survey was done in collaboration with the French International Agricultural Research organisation known as CIRAD. Samples were analysed at their Guadeloupe Station under an agreement with the West Indies Central Sugar Cane Breeding Station, of which Jamaica is a member. This then marked the first official confirmation of RSD in Jamaica.

The survey was done using a recently developed sampling technique called the tissue blot. A freshly taken core from the base of each stalk was pressed against a specially developed membrane, which was then packaged and sent to Guadeloupe for analysis.

From each field tested, 6 tissue blots were made (from 6 randomly selected stalks). Although 6 stalks would seem a small number, pathologists claim that RSD is of such a nature that this adequately determines the likelihood of the pathogen being present at any significant level in a field. The greater the number of stalks that are positive, the wider would be distribution within a field. There was just one instance, with D14146 at St Thomas Sugar, that all six stalks in a field sample were positive, Table 1. All other fields showed much lower distribution of the pathogen and only 6.88% of total stalks surveyed tested positive. In this survey, Worthy Park showed the highest number of fields with positive readings. It should be noted though that Worthy Park was averaging over 90 tc/ha, at the time of sampling, which would indicate that where good agronomic practices are maintained, the RSD effect might hardly be measurable.

Fresh samples, taken from some of the same fields where initial detection was made, at Appleton, Worthy Park and St Thomas, were sent to the CIRAD laboratory at Montpelier, France, for the more definitive test carried out by the polymerase chain reaction (PCR) process. This test failed to detect the pathogen in the Worthy Park and Appleton samples but confirmed RSD in two out of three stalk samples of D14146 from St. Thomas Sugar. The pathologist's report stated that the samples were not as highly infected as known susceptible varieties available at CIRAD, since only a few vascular bundles were infected. Nonetheless, the findings were sufficiently clear-cut to leave no doubt that RSD was in Jamaica.

Locations

Estates showing infection were Worthy Park, Monymusk, Appleton, Frome and St Thomas Sugar. Negative results were obtained from samples taken at New Yarmouth, Bernard Lodge, Long Pond and the SIRI Farm. This study was however not sufficiently comprehensive for us to say that a negative result meant that RSD did not exist on any particular estate or farm. Follow-up, more intense surveys would have to be done.

Symptoms

There are no reliable visual symptoms that can be used to detect RSD. The disease is caused by a bacterium, known as Leifsonia (Clavibacter) xyli subsp. xyli) and its net effect is a stunting of growth (which could be caused by a number of other factors). Stunting tends to be more pronounced in dry weather. With adequate moisture, visual detection is near impossible.

Worldwide Distribution

All the leading industries - Australia, Thailand, India, Mauritius, South Africa, Brazil, Cuba, USA etc - have long ago recorded the presence of RSD.

Impact

Experts say RSD may cause an estimated 5-15% yield loss without a grower even being aware of its presence. In Florida, for instance, it is reported that RSD may cause an estimated 5% yield loss in some years. Yield loss will vary depending on the degree of resistance in the variety. Impact is usually greater in older ratoons. This is therefore added reason to maintain an appropriate replanting cycle. While it is usually cost effective to maintain ratoons for as long as possible, doing so now may be providing the best conditions for development and spread of RSD. Whereas the typical replanting cycle in Jamaica used to be a plant crop and 5 ratoons, lately this has drifted to a plant and 7 or 8 ratoons (where data are available). For many small farms, replanting cycle is even longer and it is not unusual to find fields that have been going for over 20 years. It should be noted that Australia, for instance, replants every three years.

Variety Preference

No variety in the world is completely immune but there are varying degrees of resistance. Results so far in the Jamaican tests show RSD presence in D14146, BJ8226, BJ7504, BJ7262, BJ7627,

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Continuing Search for Ratoon Stunting Disease...

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BJ82119 and BJ82156. Another series of tests will be required in order to rank varieties according to degrees of tolerance.

Spread

RSD is transmitted primarily by human activity. The disease is spread during harvesting by contaminated machetes and mechanical harvester blades. Machines or tools that chop cane for planting may also contribute to the spread. Rats are also thought to be capable of spreading the disease by biting a contaminated stalk and taking the bacteria to other stalks. Recent reports suggest that it may also be possible to contaminate freshly planted setts by the bacterial ooze from old stumps remaining in a field.

Control

The most popular form of control is by heat treatment of seed pieces to establish nurseries, then taking cane seed from such nurseries to plant commercial fields. Heat treatment is usually in a water bath held at 52 degrees Celsius for 2-3 hours. SIRI will conduct screening to ensure that the more susceptible varieties are not released to the industry.

One further measure that may be conducted to slow the spread is decontamination of cane knives and harvester blades before entering new fields. Decontamination requires use of chemical disinfectants such as Lysol, ethanol, Dettol etc. The chemical should be kept in contact with the cutting surface for at least 5 minutes to ensure proper disinfection. Many industries however find decontamination too tedious and shed the practice before long. As a precaution against possible infection during replanting, old cane stubble should be properly destroyed during land preparation. In reduced tillage operations, new plantings should be placed in the previous furrow and not on banks containing stubble.

Summary

It is unlikely that RSD should cause sudden sharp drop in cane productivity in Jamaica. That is because we suspect it might have been here all along – just that we failed to detect it. We have probably kept ahead of this disease by the speed with which we change varieties. In the 1960's the industry was dominated by B4362 and B41227. By the seventies the picture changed radically to an industry built largely around HJ5741 and UCW5465. By the nineties, HJ5741 was completely removed and BJ7015 had moved to the fore. Today the slate of varieties is led by BJ7504 but there are at least half dozen others occupying significant areas – BJ7015, BJ7465, BJ82119, BJ82156, BJ7627, BJ78100 etc. This willingness on the part of growers to try the new varieties would have kept at bay this slow moving disease, spread in the

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Table 1: RSD Survey Data

Samples tested by CIRAD, Guadeloupe, using Tissue (stalk) Blot Technique

Estate/Farm	Varieties showing no RSD infection	Varieties Infected	No. stalks testing positive out of 6	*Infested vascular bundles/20
St Thomas Sugar	BJ7465, B51129, BJ7314	D14146	6	10
Long Pond	BJ7452, BJ78100, BJ7015, BJ82119, BJ7548			
Frome	BJ7465, BJ82156, BJ82119, BJ7355, BJ7015, BJ7938, BJ8252	BJ7504		
New Yarmouth	BJ8859, BJ82102, BJ8252, BJ8226, BJ7015, BJ7627, BJ7504			
SIRI Expt Farm	BJ8783, BJ8859, BJ8534, BJ8708			
Bernard Lodge	CR67400, BJ78100, BJ7555, BJ7504, BJ8226			
Monymusk	BJ7015, BJ7504, BJ82119, BJ8252, BJ7627			
Worthy Park	BJ7938, BJ7504	BJ7262	4	12
		BJ7452	1	2
		BJ82119	1	13
		BJ7627	2	9
		BJ82156	1	13
Appleton	BJ7465, BJ7015, BJ8226, BJ7452	BJ7504	1	20
		BJ7262	1	5

*Applies only to the infected stalk(s)

Total number of stalks sampled = 378

Total number of stalks RSD positive = 26 (6.88%)

Boosting Small Farm Productivity...

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3. farmer training in improved farming practices;
4. setting up a pilot centre pivot irrigation system to serve a group of farmers;
5. efforts to counter yield decline on farmers' holdings
6. financial and economic evaluation of optimum farm modules for viability
7. putting out Project results so that other cane farmers may benefit

The total cost of the project is US$2.538 million. Of this, the CFC will provide $1.5 million as a grant. The rest of the funding will be the local contribution to the project, valued at USD1.038 million comprising development and cultivation activities by the grower along with the technical services of SIRI.

A project of this nature places tremendous responsibility on SIRI as well as on Caroni Ltd, the Trinidadian counterpart. These two organisations must see to the successful implementation of the project in accordance with the plans approved by the CFC. They will be subject to close scrutiny by the CFC and ISO and management of the grant will be regularly audited. More importantly, this project offers a real opportunity to make a difference to farmers by lifting productivity thus increasing chances of survival in a competitive industry.

PROJECT STATUS

The nursery project seeks to accelerate the speed with which growers on smallholdings get access to new improved varieties emerging from SIRI's variety development programme as well as provide seed cane of suitable quality for replanting. From SIRI's primary nurseries, farmers are supplied seed cane for setting up secondary nurseries. After returning an equal quantity of seed cane to SIRI for distribution at its discretion, material from secondary nurseries will be used to establish tertiary (commercial) nurseries.

By June 2004, the first phase of planting secondary nurseries had seen establishment of over 46 hectares on 16 farmer's holdings distributed over Clarendon, Westmoreland, St. Elizabeth, Trelawny, and St Catherine. Seed cane from the earlier established nurseries should be available by July-September for extension to tertiary nurseries. Varieties being propagated under this programme arre BJ8532, BJ8534, BJ78100, J9501, BJ8252, BJ82156 and BJ82102.

Under the scheme to have farmers participate in variety evaluation, growers are provided two or three of the newer varieties, which are planted in parallel strips permitting easy comparison of growth habits and yield so that the farmer may assess for himself the performance of the varieties against the familiar standards. Two of these trials were in the ground (one each in Clarendon and Westmoreland) by the end of June.

Farmer training will eventually cover all aspects of sugar cane growing. By June the first formal training seminar was held at the Mid-Clarendon Irrigation office and cane was established in two demonstration plots in St. Catherine.

A contract was signed for the supply and installation of a centre pivot irrigation system covering some 70 hectares to benefit approximately 20 growers in Content, Clarendon. Land clearing was carried out on holdings, which would be brought under cane cultivation so that no land was wasted under the pivot, while land preparation and planting was being done in fields which needed replanting. Growers involved were formed into a special Water User Group to manage the system. Two persons from within the project area were selected for on-the-job training in setting up and operating the system.

The Yield Decline study will take the form of crop rotation to interrupt the cycle of continuous cane cultivation. Land will be put under other crops for a year before returning to cane cultivation and the effect on soil properties and cane yield measured. The rotation crop chosen was Sea Island cotton. This was scheduled for planting in early August at sites in Trelawny and Clarendon.

For the study of optimum farm modules, a booklet for recording field operations, input, costs, yields as well as profit and loss was being prepared for distribution among selected growers who would be trained in its use to provide vital information. This study will get fully underway towards the end of 2004.

DISSEMINATION

Findings from this project will become the property of the CFC. Results will be used, during the course of the project, to benefit other growers in Jamaica and Trinidad and will be published to benefit other CFC member countries. At the end of the project, delegates from across the World will be visiting to view and discuss achievements.

Every effort is being made to carefully and properly execute this project. Chosen participants must be reliable and committed to ensure that desired results are achieved. We plan to work hard to ensure success.❁

Continuing Search for RSD...

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manner described.

At this time, growers are not advised to do emergency removal of any variety. The few remaining fields of D14146 should be removed and the ordered withdrawal of BJ8226 should continue. Meanwhile, SIRI will do a more intense survey so that a more comprehensive picture may be obtained of the presence of RSD. Screening for RSD will now be added to the present disease-testing programme, which now includes testing for smut and rust, before varieties are released to the industry. Smut and rust are regarded as much more devastating diseases. The industry dealt successfully with those. There is no reason to believe it should not be able to handle this further challenge.❁

IN THIS BUSINESS

This should fetch a good cane price!

Good Stumping

This won't!

Bad Stumping

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