22nd ANNUAL REPORT 1974

MAURITIUS SUGAR INDUSTRY

RESEARCH INSTITUTE

ANNUAL REPORT 1974

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} *representing small planters*

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Mr. J. Leclézio
} *representing the Société de Technologie Agricole et Sucrière*

and the Senior staff of the Research Institute.

STAFF

(As at 31.12.74)

Director

R. Antoine, B.Sc. (Lond.), A.R.C.S., Dip. Ag. Sci. (Cantab.), Dip. Agr. (Maur.)

Assistant Director

J. D. de R. de Saint Antoine, B.S. (L.S.U.), Dip. Agr. (Maur.)

Plant Breeding and Biometry

Plant Breeder and Biometrician ...	J.A. Lalouette, Dip. Agr. (Maur.)
Associate Plant Breeder ...	P.R. Hermelin, Dip. Agr. (Maur.)
Assistant Plant Breeder	Z. Peerun, B.Sc. (Wales)
Assistant Biometrician	L.C.Y. Lim Shin Chong, B.Sc. (Leicester), M.Sc. (Reading)
Field Assistant	S. Duchenne
Scientific Assistant	Miss M. Ng Yan Luk

Plant Pathology

Chief Plant Pathologist ...	C. Ricaud, B.Sc., Ph.D. (Lond.), D.I.C.
Associate Plant Pathologist ...	J.S. Félix, Dip. Agr. (Maur.)
Assistant Plant Pathologist ...	J.C. Autrey, B.Sc. (Lond.)
Experimental Officer	S. Sullivan
Scientific Assistant	S. Dhayan

Entomology

Chief Entomologist	J.R. Williams, B.Sc., M.Sc., Ph.D. (Bristol), D.I.C., F.I. Biol.
Assistant Entomologists ...	H. Dove, Dip. Agr. (Maur.)
	M.A. Rajabalee

Botany

Botanist	H.R. Julien, B.Sc., Ph.D. (Reading)
Assistant Botanist	G.C. Soopramanien, B.Sc., M.Sc. (Lond.), Dip. Agr. (Maur.)
Scientific Assistant	A. Bastide

Weed Agronomy

Weed Agronomist	G. McIntyre, B.Sc. (Lond.), Dip. Agr. (Maur.)
Scientific Assistants	C. Barbe
	J. Pitchen

Sugar Cane Agronomy

Chief Agriculturist	G. Rouillard, Dip. Agr. (Maur.)
Senior Field Officer	L. Thatcher, Dip. Agr. (Maur.)
Field Officers	A.P.F. Chan Wan Fong, Dip. Agr. (Maur.)
	J.R. Moutia, Dip. Agr. (Maur.)

Food Crop Agronomy

Technical Officer i/c	J.R. Mamet, Dip. Agr. (Maur.)
Assistant Agronomist	A.R. Pillay, B.Sc. (Q.U.B.), M.Sc. Agr., Ph.D. (Sydney), Dip. Agr. Micro (Sydney)
Experimental Officers	J.C. Carmagnole, Dip. Agr. (Maur.)
	H. Toohim
Scientific Assistants	G. Claite
	J.K. Wong Yen Cheong

Soils and Plant Nutrition

Chief Chemist	Y. Wong You Cheong, B.Sc., B. Agr., Ph.D. (Q.U.B.), F.R.I.C.
Senior Assistant Chemist ...	L. Ross, Grad. R.I.C., Dip. Agr. (Maur.)
Assistant Chemists	P.J. Deville, B.Sc. (Wales), Dip. Agr. (Maur.), A.R.I.C.
	L.C. Figon
	C. Cavalot
Scientific Assistants	Mrs. J. Gauthier
	I. Jhoty
	H. Maurice

Sugar Technology

Sugar Technologist	J.T. d'Espagnet, B.Sc. (Glasgow), A.R.C.S.T., Dip. Agr. (Maur.)
Chemist	E.C. Vignes, B.Sc., M.Sc. (Lond.), F.R.I.C., Dip. Agr. (Maur.)
Senior Assistant Chemist ...	M. Randabel, Dip. Agr. (Maur.)
Assistant Sugar Technologist ...	J.F.R. Rivalland, B.E. (Chem.) (Queensland), M.I. Chem. E.
Scientific Assistants	M. Abel
	L. Le Guen

Agricultural Engineering

Agricultural Engineer	L. Li Pi Shan, B.E. (Agr.) (Sask.), Dip. Agr. (Maur.), M. I. Agr. E., M.I. Mech. E., C. Eng.
Associate Agriculturist ...	M. Hardy, Dip. Agr. (Maur.)
Technical Officer	G. Mazery, Dip. Agr. (Maur.),
Senior Assistant (Soil Physics) ...	P.Y. Chan, B.Sc., M.Sc. (Lond.), A.R.I.C.
Scientific Assistants	D. Ah Koon
	L. d'Espagnac

Library

Librarian	Madeleine Ly-Tio-Fane, B.A., Ph.D. (Lond.)
Scientific Assistant	C. Chan King Choy

Draughtsmanship & Photography

Draughtsman-Photographer	...	L.S. de Réland, Grad. N.Y.I.P.
Asst. Draughtsman-Photographer		J. Forget

Public Relations

Liaison Officer	...	R. Ng Ying Sheung, Dip. Agr. (Maur.)
Experimental Officer	...	P. Ferré

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Asst. Secretary-Accountant	...	P. Rivet
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		Mrs. J. Cavalot
		Miss E. Cox
		Mrs. M. Montocchio
		Miss A. North-Coombes
		Mrs. M.T. Rae
Telephonist	...	Miss G. Morin

Also 21 Junior Technicians attached to various divisions.

THE MAURITIUS HERBARIUM

Curator	...	H.R. Julien, B.Sc., Ph.D. (Reading)
Herbarium Assistant	...	J. Guého

INTRODUCTION

Origins of the Institute

Organised agricultural research in Mauritius can be said to have started when the *Station Agronomique* was inaugurated on 30th June 1893. The results of the valuable work of the *Station* are embodied in 18 Annual Reports and various Bulletins and papers.

In the first decade of the twentieth century, it was felt that to keep pace with the times a new central organization was needed to guide the efforts of the agricultural community. Consequently, in 1913, the Colonial Office created the Department of Agriculture, and the *Station Agronomique* and the Bureau of Agricultural Statistics of the Chamber of Agriculture were absorbed in the new organisation. The next development was in 1930, when in order to cater for research and experimentation directed particularly towards improving efficiency in the sugar cane industry, a Sugar Cane Research Station was organised as a Division of the Department of Agriculture. The Station operated until 1952 and the results of its work are to be found in 23 Annual Reports and 19 Bulletins, which include important contributions to knowledge of the sugar cane plant.

In 1953 the work of the Sugar Cane Research Station was taken over by the Mauritius Sugar Industry Research Institute, which was created following a recommendation made in 1947 by the Mauritius Economic Commission that the sugar industry should organize and undertake its own research.

Organization and Finance

Established by Ordinance No. 9 of 1953, the objects of the Institute were originally "to promote by means of research and investigation the technical progress and efficiency of the sugar industry". In recent years, however, the Institute has become increasingly involved in the country's battle for self-sufficiency, in particular with crop diversification by production of secondary crops in cane interlines and on cane land between crop cycles. A programme of research on this subject was initiated in 1968, with the aid of a grant from the Chamber of Agriculture, and was expanded with financial assistance from the Government and the private sector until in 1970 a Division of Foodcrop Agronomy became an integral part of the Institute. Sugar cane cultivation and sugar manufacture remain, however, the main preoccupations of the Institute.

The Institute is governed by an Executive Board, composed of representatives of Government and the Sugar Cane Planting Community, and financed mainly by means of a cess on sugar borne by all cane growers. Its programme of research is elaborated through a Research Advisory Committee, which maintains close co-operation with the Agricultural Services of the Ministry of Agriculture, The Mauritius Chamber of Agriculture, and the University of Mauritius.

The Institute's head office at Réduit comprises divisions of Plant Breeding and Biometry, Plant Pathology, Entomology, Botany, Weed Agronomy, Sugar Cane Agronomy, Food Crop Agronomy, Soils and Plant Nutrition, Agricultural Engineering, and Sugar Technology. In addition there are three experimental stations in other climatic zones of the island.

In 1972, some important changes were made by Act No. 7 of 1972 to the legislation governing the Institute (Ordinance No. 9 of 1953). These changes concerned the composition of the Executive Board and the cess levied on sugar. Thus, representatives of the Ministry of Finance and of the Ministry of Economic Planning and Development were added to the Board, the composition of which became :

(a) Appointed members :
One to represent the Chamber of Agriculture, three to represent the owners of sugar cane estates with factories, one to represent large planters, and two to represent small planters.

(b) Nominated members :
One from the Ministry of Agriculture and Natural Resources, one from the Ministry of Finance, and one from the Ministry of Economic Planning and Development.

The cess, originally levied on sugar exported and from 1969 on sugar produced, was at first borne uniformly by all sugar producers; it was subsequently increased for Miller-Planters and to a lesser extent for large planters (producing not less than five thousand tons of sugar cane annually), and slightly reduced for small planters.

The Library

The scope of the library is concomitant with the research activities of the Institute, its primary function being to serve the needs of the Institute's staff. Its facilities are, however, available to any *bona fide* research worker or student.

The library was started in 1953, at the inception of the Institute, with collections of technical literature on sugar cane agronomy and sugar manufacture. It was gradually enlarged and also enriched with collections of prints and original drawings of sugar cane varieties and with early publications on the history of the sugar cane. Today it contains 14,620 volumes and the periodicals and reports that are received total 565 titles. Apart from its comprehensive collection of publications on sugar cane cultivation and sugar manufacture, the library also now possesses publications concerning many aspects of tropical agriculture and various disciplines of biological science.

In 1960, the library acquired a collection of rare literature on the flora of the Mascarenes consequent to the transfer of the Mauritius Herbarium to the Institute.

Owing to distance from other research centres, library policy has been to concentrate on acquiring runs of relevant periodical literature and today complete sets of many agricultural periodicals, some of them rare, are available for consultation. It has also been library policy to collect scientific publications and reports relating to the Mascarenes and other islands of the Western Indian Ocean.

Co-operation with other organisations includes liberal exchange of publications, those of the Institute being *Annual Reports*, *Occasional Papers*, *Technical Circulars*, *Weed Flora* leaflets and occasional monographs.

The Mauritius Herbarium

The origin of the Mauritius Herbarium goes back to the early 19th Century. The first herbarium was housed in the Royal College, Port Louis, and the collections were transferred in 1868 to the Royal Botanical Gardens, Pamplemousses, then under the control of the Director of Forests and Gardens. After a period of decline which lasted nearly fifty years, it was decided in 1928 to start a botanical section, regional in character, at the Mauritius Institute (Public Library and Museum) and the Mascarene specimens at the Royal Botanical Gardens were restored as far as possible to form the basis of the new botanical section of the Museum.

In 1958, it was proposed that the herbaria of the Department of Agriculture and of the former Sugar Cane Research Station should be combined with that of the Mauritius Institute and housed in air-conditioned quarters at the newly founded Sugar Industry Research Institute. The work of transferring and combining the three herbaria was completed two years later and the Mauritius Herbarium came into being. Finally, at the end of 1959 it was decided that the Herbarium should become integrated with the Botany Division of this Institute, the Botanist in charge assuming the post of Curator.

The Herbarium now possesses some 19,000 specimens and has become not only an excellent reference collection for the identification of plants but also a centre for research, by local and visiting specialists, on the flora of the Mascarene Islands.

GENERAL REPORT

Board Membership

The following changes took place in the composition of the Board in 1974 : Mr. D. Sibartie replaced Mr. M. Baguant as representative of the Ministry of Economic Planning & Development; Mr. T. Maigrot replaced Mr. S.D. de R. de St. Antoine as representative of factory owners; and Mr. S. Butan replaced Mr. R. Seeruttun as representative of small planters.

Establishment

Resignations during the year were those of Mr. J. Vaudin, Assistant Agronomist, Dr. P. Nababsing, Assistant Chemist and Messrs. R. Wan Sai Chong, A. Bastide and C. Chan King Choy, Scientific Assistants in the Divisions of Sugar Technology and Botany and in the Library respectively.

Promotions granted during the year were as follows : from Associate Head to Head of Division : Dr. M. Ly-Tio-Fane (Library), Mr. G. Mc Intyre (Weed Agronomy); from Senior Assistant to Associate Head of Division : Mr. L.S. de Réland (Draughtsmanship-Photography); from Scientific Assistant to Assistant Head of Division : Mr. J.C. Autrey (Plant Pathology), Mr. C. Cavalot (Soil and Plant nutrition); from Scientific Assistant to Experimental Officer : Mr. P. Ferré (Liaison), H. Toohim (Food Crop Agronomy); from Junior Technician to Scientific Assistant : Miss M. Ng Yan Luk (Biometry), Mr. C. Chan King Choy (Library), Messrs. K. Wong Yen Cheong and G. Claite (Food Crop Agronomy) and Mr. C. Barbe (Weed Agronomy).

Mr. J. Lim Shin Chong was awarded the M.Sc. in Biometry by the University of Reading and Mr. J.C. Autrey the B.Sc. in Botany by the University of London. Mr. R. Rivalland, B.E. (Chem.) was accepted as member of the Institute of Chemical Engineers, London, and as an Associate Member of the American Institute of Chemical Engineers.

Finance

A special gratuity equivalent to two months' basic salary was voted by the Board in December and paid to all members of the Institute.

Technical Assistance

Movements of scientists whose services are provided under the Franco-Mauritian Cultural and Technical Assistance Scheme were as follows : Messrs. J.F. Klein left the Institute in May and Messrs. D. Jamin and B. Lévêque in October; four Agronomists, Mr. P. Codron, who arrived in February, Messrs. G. Ecorcheville and G. Poillot, who arrived in September, and Mr. P. Maumont, who arrived in November, were attached to the Divisions of Plant Pathology, Sugar Technology, Soils and Plant Nutrition, and Weed Agronomy, respectively.

Mr. D. Lorence, a U.S. Peace Corps Volunteer who is attached to the Botany Division and Herbarium, went on home leave for five weeks and on the return journey stopped for one week at the Kew Herbarium to study Ferns in connection with the *Flora of the Mascarene Islands*, now in preparation.

Building Programme

The extension of the Biology/Agronomy Wing to house the Sections of Land Resources Survey and Draughtsmanship-Photography was completed and occupied. The Biometry building was enlarged to house the computer and additional staff. Long-due alterations were made to the Weed Agronomist's office and laboratory in the Biology Wing. New stores were built for the Administration and Weed Agronomy Divisions. The Plant Pathology greenhouse was enlarged. Alterations were effected to the garage and workshop building in order to house the Agricultural Engineering Division. Three glass-fibre tanks were constructed for the Plant Breeding Division for the preparation of crossing solutions.

Staff Association

The M.S.I.R.I. Staff Association, with 90 members, was formed and officially recognised by the Executive Board.

Director's Missions

The Director, in February, visited *O.R.S.T.O.M.*, Paris, to sign the Franco-Mauritian convention on the *Flora of the Mascarene Islands* for the Government of Mauritius, and the *Museum National d'Histoire Naturelle*, Paris, to discuss progress in the preparation of the *Flora*. He went to Réunion Island in May and November, mainly to see and discuss developments in the mechanisation of loading and harvesting operations of sugar cane. He also spent one week in Malawi in early December to visit the sugar cane lands.

In June, as Regional Vice-Chairman of the International Society of Sugar Cane Technologists, he led the Mauritian delegation to the XVth Congress of the Society, which was held in the Republic of South Africa. The Institute was also represented at the Congress by Messrs. J.D. de R. de St. Antoine, L. Li Pi Shan, J.T. d'Espaignet, Drs. R. Julien, C. Ricaud and Y. Wong.

Staff Movements

The following officers went on overseas leave during the year : Messrs. P.Y. Chan, P. Ferré, J. Forget, J. Guého, R. Mamet, J. Pitchen, R. Rivalland, L. Ross, E.C. Vignes and Drs. P. Nababsing and J.R. Williams. All spent some of their time visiting research establishments, etc., and meeting specialists in their own fields of work.

Mr. Chan visited various research centres in England and Scotland to obtain information on the latest techniques employed in the measurement of soil physical properties in connection with irrigation studies; Mr. Forget attended a ten-day training course at Agfa-Gevaert N.W., Belgium; Mr. Guého spent some time at the Herbarium of the Royal Botanic Gardens, Kew, and at the *Museum d'Histoire Naturelle*, Paris, working on the *Flora of the Mascarene Islands;* Mr. Mamet visited various official and private organizations in France, Belgium, Italy and England connected with research and production of food crops; Dr. Nababsing attended the Congress of the Tropical Products Institute in England and visited research centres in Scotland, Holland and France; Mr. Rivalland called at various sugar research organisations in the Republic of South Africa; Mr. Ross visited the *Institut de Recherches Agronomiques Tropicales* in France; Mr. Vignes attended the I.C.U.M.S.A. meeting held in Ankara and later visited refineries in the U.S.A. and Canada; and finally, Dr. Williams attended the 3rd International Congress of Pesticide Chemistry in Helsinki and later visited research centres in the U.K.

Mr. J.C. Autrey left for one year to read for an M.Sc. in Plant Pathology at the University of Exeter. Mr. J. Deville received a British Council Award to read for an M.Sc. in Animal Nutrition at the University College of North Wales.

Comité de Collaboration Agricole

The annual meeting of the *Comité* was held in Mauritius in November, under the Chairmanship of the Director. A full delegation from Réunion and two delegates from the Comore Islands attended the meeting; Madagascar, unfortunately, was not represented.

The representatives from Mauritius apart from the Director were Mr. C. Noel, President of the Mauritius Chamber of Agriculture, Mr. A. Wiehé, President of the *Société de Technologie Agricole et Sucrière de l'Ile Maurice*, Mr. Serge Jullienne, President of the *Comité Central des Administrateurs*, Mr. P. Narain, Ministry of Agriculture and Natural Resources and Mr. P.G. du Mée, Secretary-Treasurer of the *Comité*.

It was decided that the next meeting of the *Comité* would be held in Réunion in October 1975.

The Director and Messrs. L. Li Pi Shan, G. Mazery and R. Hermelin visited Réunion in November under the auspices of the *Comité* to study recent developments in mechanical loading and harvesting of sugar cane.

Personalia

The following visitors were welcomed at the Institute during 1974 : Sir Raman Osman, Governor-General of Mauritius; Mr. C.C. Athachinda, Ministry of Industry, Thailand; Mr. A. Bekkali, *Institut Agronomique et Vétérinaire Hassan II*, Rabat; Dr. Boerma, Director General FAO; Mr. Brah, *Directeur de l'Agriculture, République du Niger*; Mr. B. Buscall, Low Farm, Norfolk, U.K.; Messrs. T.G. Cleasby, J. Gunn and M. Greenfield, Tongaat Sugar Ltd., Natal, South Africa; Mr. J. Ellyatt and Mr. A. Tata, Tate & Lyle Ltd., U.K.; Mr. L. Gahamanyi, *Directeur Général de l'Agriculture*, Rwanda; Mr. A.H. Gentry, Missouri Botanical Garden, U.S.A.; Mr. A.G. Gilmour, Blyth Brothers Ltd., Mauritius; Mr. M. Griffith, Agricultural Research Council, London; Mr. G.D. Hubble, Principal Research Officer, CSIRO, Australia; Mr. H.M. Kasiga, Director, Manpower Development Division, Ministry of Agriculture, Dar-es-Salaam, Tanzania; Mr. Kayinga Onsi N'Dal, *Commissaire d'Etat à l'Agriculture*, Zaïre; Mr. H.W. Kerr, Brisbane, Australia; Father I. Kilage, Messrs. N. Derr and K. Pochapon, University of Papua and New Guinea; Mr. I. Kouton, *Directeur Général de L'Action Rurale*, Dahomey; Mr. L. Lapeby, *Directeur Général, Ministère de l'Agriculture, de l'Elevage et du Développement Rural*, Gabon; Mr. J. Leclerc, *Représentant de la FAO*, Madagascar; Messrs. M. Miller, J.S. Collecott, C. Czarnikow & Co., New York, U.S.A.; Messrs. A. Morris and R. Body, members of the British Parliament; Mr. E. Morrison, South African Cane Growers' Association; Mr. A. Nyaruhirira, *Directeur, Station de Recherche Agronomique*, Burundi; Mr. B.J. Ondo, *Ministère de l'Agriculture* Gabon; Mr. R. J. Pease, British High Commission, Port Louis; Mr. John Procter, The World Wildlife Fund; Mr. J. Ruremesha, *Chef de Bureau de Pêche et Pisciculture, Ministère de l'Agriculture et de l'Elevage*, Rwanda; Mr. S. Sar, *Chef du Bureau Afrique*, FAO, Rome; Mr. A. Saranin, Central Sugar Cane Prices Board, Australia; Mr. R. Savory, Pasture Agronomist, FAO; Dr. M. Saxena, Adviser to Ministry of Cooperatives and Cooperative Development, Mauritius; Mr. A.W. Shield, Manager, Kalamia Mill, Australia; Dr. G.E. Sloane, Head of Sugar Technology, H.S.P.A., Hawaii; Mr. O. Sturgess, Director, Bureau of Sugar Experiment Stations, Brisbane, Australia; Dr. R.J. Summerfield, University of Reading, U.K.; Messrs. R.A. Suthers and P.V. Valmadre, Properpine Mill, Australia; Mr. C. Sylla, *Sucrerie de la Côte Est*, Madagascar; Dr. F.A. Tate, Vice-Chairman, Tate & Lyle Ltd.,

London; Dr. G. Thomson, Director, Experiment Station, South African Sugar Association, Mount Edgecombe, Natal, South Africa; and Mr. R. Wall, Chairman of the Sugar Board, U.K.

Research Visitors and Study Groups

The following visitors spent some time working at the Institute or else called at the Institute on a few occasions while on mission to Mauritius : Mr. M. Arraudeau, *Ingénieur en Chef de Recherche, IRAT*, Madagascar; Mr. J. Bosser, *O.R.S.T.O.M.*, Paris; Dr. D. Smith, Chief Editor of Sugar Y Azucar; Messrs. Fang Meng, Hsieh Chien-hui, Liang Tso, Chen Chao-hsuan and Hai Ying, Light Industry Bureau, Kwangsi Province, China; a seven-member delegation, led by Mr. M. Hoarau, of the *Groupement des Producteurs des Viandes Bovines Améliorées*, Réunion Island; a sixteen member delegation of the Deccan Sugar Technologists Association, India, led by Dr. D.K. Patel; Messrs. R.D. Archibald, A.R. Crooks, M.A. McEnvoy and E.A. Smith, Hewletts Sugar Ltd., Natal, South Africa; Messrs. Rechenmann and Misseque, *O.R.S.T.O.M.;* Professer S. Starmühlner and Dr. G. Weninger, Zoology Institute, Vienna University; Messrs. A. Elabassi, H. Elasry, Rakni, Taieb, Kabdi, Ahebban and Allaoui of the *Sucrerie Nationale de Canne du Sebou*, Morocco; Miss P.I. Edwards, Botany Library, British Museum of Natural History; Professor S.N. Slater, Assistant Vice-Chancellor, Victoria University, Wellington, New Zealand; Mr. M. Coode, Royal Botanic Gardens, Kew, U.K.; Mr. S. Temple of The World Wildlife Fund and IUCN; Mr. A. Cheeke, of the British Ornithological Union; and Mr. S.C. Sharma, Cawnpore Sugar Estates Ltd., India.

Aimé de Sornay Scholarship

The scholarship was awarded in 1974 to Mr. P.F.A. Carles who came second at the Entrance examinations of the University of Mauritius held in June.

The studies of the two other scholars, Miss D. Lam Ming Kam and Miss C. Jomadar, progressed satisfactorily.

Miss S.Y. Ip Hoi Yen, the 1971 scholar, obtained an Honours Diploma in Agriculture and Sugar Technology in May 1974, being first in the final classification with an overall average of 68.6%.

University of Mauritius

The Director sat on the Council, Dr. Ricaud on the Senate, Drs. Julien and Pillay and Mr. Vignes on the Court of the University of Mauritius.

Membership of various Committees and Boards of the University were as follows : Messrs. D. de R. de St. Antoine and d'Espaignet on the Sugar Technology Advisory Committee; Messrs. d'Espaignet, Randabel, Rivalland and Vignes on the Board of Examiners, School of Agriculture; Mr. Rivalland on the Board of Examiners, School of Industrial Technology.

As usual, lectures were delivered at the University by various members of the Staff.

Representation on Boards and Committees by Members of Staff

Ancient Monuments and Nature Reserves Board
Dr. Julien, Mr. Rouillard.

Board of Agriculture, Fisheries and Natural Resources
Director

Board of Directors, Mauritius Institute
Director (Chairman), Messrs. D. de R. de St. Antoine and Rouillard.

Board of Examiners for the Registration of Agricultural Chemists
Messrs. D. de R. de St. Antoine and Vignes.

Cane Planters & Millers Arbitration and Control Board (Committee for Core Sampling of Sugar Cane)
Messrs. d'Espaignet and Lalouette.
Cane Release Committee
Director (Chairman), Mr. Lalouette, Dr. Ricaud.
Comité, Société de Technologie Agricole et Sucrière de Maurice
Director, Messrs. D. de R. de St. Antoine, d'Espaignet, Randabel, Figon and Dr. Ricaud.
Committee for the International Hydrological Decade
Mr. Li Pi Shan.
Committee on the Manufacture of Concentrates based on bagasse and molasses
Dr. Wong and Mr. d'Espaignet.
Committee, Professional Engineers' Association
Mr. d'Espaignet.
Conseil d'Administration, La Revue Agricole et Sucrière de l'Ile Maurice
Director, Messrs. D. de R. de St. Antoine (President), Rouillard, Randabel.
Council, Registered Professional Engineers
Mr. d'Espaignet.
Council, Royal Society of Arts & Sciences of Mauritius
Director, Messrs. D. de R. de St. Antoine, Rouillard (Chairman), Mamet, Drs. Ricaud and Ly-Tio-Fane.
Food Crops Insurance Committee
Mr. Mamet.
International Society of Sugar Cane Technologists
Director (Regional Vice-Chairman)
Irrigation Committee
Mr. Mazery.
Livestock Committee, Chamber of Agriculture
Dr. Wong.
Mauritius National Committee for ICUMSA (International Commission for Uniform Methods of Sugar Analysis)
Messrs. D. de R. de St. Antoine (Chairman) and Vignes.
Mauritius Sub-Committee for the preparation of the *Flora of the Mascarene Islands*
Director (Chairman) and Dr. Julien.
Ministry of Agriculture, Natural Resources and Environment :
Man and Biosphere Advisory Committee
Dr. C. Ricaud.
Science Sub-Committee
Dr. R. Julien.
National Food Production Committee, Mauritius Chamber of Agriculture
Director, Dr. Wong and Mr. Mamet.
Plant Introduction and Quarantine Standing Committee
Drs. Williams and Ricaud.
Permanent Advisory Committee for the Royal Botanical Gardens, Pamplemousses
Dr. Julien.
Pesticides Control Board
Drs. Williams and Ricaud.

Television Talks

Television talks for small planters delivered by the staff of the Institute, which started in 1971, were continued in 1974 with 24 lectures, 16 being devoted to various aspects of sugar cane cultivation and 8 to the growing of food crops.

Booklets based on these talks will be available in 1975.

Lectures and Meetings at Head Office

2nd May — R.S. PRINCE. Chemical cleaning of boilers.[1]

8th May — K. GAWL and A. HAUMERSEN. Demonstration of automatic polarimeters.[2]

21st May — R. ANTOINE. *Revue des travaux du MSIRI en 1973 (Champs).*

28th May — J.T. D'ESPAIGNET. *Revue des travaux de la Division de Technologie Sucrière en 1973.*

9th July — E. BOUVET. *La mécanisation de l'industrie sucrière aux Iles Hawaii.*

23rd July — Y. WONG YOU CHEONG. *Nouveau regard sur la fertilisation de la canne.*

20th August — C. RICAUD. *L'emploi du Benlate en remplacement des organo-mercuriques dans le traitement des boutures de canne à sucre.*

S. FELIX. *Traitement des semences de pomme de terre à la plantation.*

23rd August — A.T.M. GARDNER. From coastline to moorland, a glimpse of Kenya's landscape.[3]

24th September — A.R. PILLAY. *La production et la culture du maïs hybride.*

15th October — G. MC INTYRE. *Performance des nouveaux herbicides.*

18th November — R. SALM and J. PROCTER. Forests and fishes — crags and corals of Mauritius.[3]

19th November — J.R. WILLIAMS. Nature of the damage caused by the spotted borer of sugar cane.

17th December — R. ANTOINE. *Variétés de cannes à sucre pour la grande culture.*

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(1) Meeting under the joint auspices of the *Société de Technologie Agricole et Sucrière de l'Ile Maurice* and the Professional Engineers' Association.

(2) Meeting under the auspices of the *Société de Technologie Agricole et Sucrière de l'Ile Maurice.*

(3) Meeting under the auspices of the Royal Society of Arts and Sciences.

Library Affairs

Professor Dr. Franz Josef Kribben of the Department of Botany, University of Frankfurt-am-Main, kindly donated the 18-volume *Encyclopaedia of Plant Physiology*, edited by W.R. Ruhland; Berlin, Springer-Verlag, 1955-1967.

The first stage of the bibliographical work originally undertaken in 1969 in co-operation with the Berlin Sugar Institute, and later with Tate & Lyle Ltd. (Group Research & Development, Reading) was completed with the publication of an *International List of Serials dealing with Sugar and Related Subjects*. The work is being continued with the quarterly publication : *New Sugar Titles, an annotated bibliography*.

Publications

ANON. (1974). *Les cultures vivrières. I. La Pomme de Terre*. Mauritius Sugar Industry Research Institute. Imp. Commerciale, Port Louis, 25 pp.

The first of a series of advisory booklets based on television talks given by staff of the Institute.

ANON. (1974). Plant data of Mauritius sugar factories. *Tech. Circ. Maurit. Sug. Ind. Res. Inst.* (*Sug. Tech. Ser.*) **2** : 13 pp (mimeo).

ARLIDGE, E.Z. (comp.) (1973). *Land resources and agricultural suitability map of Mauritius*. 1 : 50,000. Food and Agricultural Organization of the United Nations and Mauritius Sugar Industry Research Institute (Map in two parts: Legend 17 pp.)

BOWMER, K.H., LANG, A.R.G., HIGGINS, M.L., PILLAY, A.R. & TCHAN, Y.T. (1974). Loss of acrolein from water by volatization and degradation. *Weed Res.* **14** : 325-328.

The loss of acrolein by volatilisation and degradation from a large tank of water is described. The standard analytical method for carbonyl compounds did not distinguish acrolein from a relatively non-volatile and non-toxic reaction product. In a modification of the method to correct the error, acrolein was separated from reaction products by scrubbing with air. It was found that loss of acrolein by evaporation from an open tank is much less than its loss by reaction in irrigation water.

DEVILLE, J. & WONG YOU CHEONG, Y. (1974). Composition and yield of sugar cane at different ages in relation to its utilization as an energy source for livestock. *Revue agric. sucr. Ile Maurice* **53** : 132-137.

The object of feeding sugar cane to cattle is to provide the bulk of the energy requirements in the form of carbohydrates. The yield and composition of sugar cane stalks, derinded stalks and tops at ages of 5, 7 and 10 months were studied for varieties S 17 and M 93/48 at Henrietta and varieties S 17 and M 377/56 at St. André. Better yields of carbohydrates were obtained from 7 months old cane at St. André than from 10 months old cane at Henrietta. The yields from the latter were comparable with those from 12-18 months old cane in Barbados.

FELIX, S. & RICAUD, C. (1974). Fungicidal control of Cercospora leaf spots of groundnut. *Revue agric. sucr. Ile Maurice* **53** : 185-192.

A series of trials was carried out in various localities from 1970 to 1973 to test several fungicides or fungicide combinations at various dosages and with various methods of spraying for the control of *Cercospora* leaf spots of groundnut. The most economical interval between treatments was also assessed. Best results were obtained with a combination of Dithane M 45 and Benlate (1 lb Dithane + 1/4 lb Benlate/arp) applied at 15-day intervals with knapsack power sprayers in 50 gallons water. Specific recommendations are given for spraying schedules at different periods of the year.

HAGELBERG, G.B., ALFORD, A., LY-TIO-FANE, M. & TRAPP, U. (1974). *International list of serials dealing with sugar and related subjects.* Institut für Zuckerindustrie, Berlin. 80 pp.

A finding list for workers in the sugar industry and a basis for further bibliographical studies. Titles are listed alphabetically with indication of locations. A geographical listing of serial publications is appended.

JULIEN, R. (1974). An evaluation of methods used for maturity testing. *Proc. int. Soc. Sug. Cane Technol.*, **15** : 991-1,000.

The use of the following as criteria of maturity was evaluated : field and laboratory brix, glucose ratio, moisture content of internodes and spindle, and brix ratios. Highest correlation coefficients were obtained between pol % cane and laboratory brix throughout the harvest season. Correlations between pol % cane and field brix were significant only for the early and middle parts of the harvest season, and those between pol % cane and field brix ratios were not significant. The best methods of detecting maturity in a field appeared to be the evolution of field and laboratory brix in time. Field sampling techniques were studied for these methods. In a three stage sampling, a field was divided into four blocks within which three sites were selected and at each site three readings of field and laboratory brix were recorded. Differences between blocks were generally not significant while the optimum number of readings per site was found to be two. The number of sites per block varied with variety, locality and character measured. The best index was found to be the evolution of field brix recorded at the top of the cane (5/6 height of stalk). Determination of laboratory brix required fewer samples than determination of field brix but was rejected because of its higher cost.

JULIEN, R. (1974). Studies of ripeners on sugar cane. I. Effects of Mon 045 on growth and sucrose content. *Expl Agric.* **10** : 113-122.

The sugar cane ripener Mon 045, tested on three commercial sugar cane varieties, caused responses depending on variety, time of application, dosage rate and the interval between application and harvest. Age of crop at application appeared to have little influence on the response. The chemical was also shown to have growth-inhibiting properties. The possible use of this chemical to increase sugar produced per unit area is discussed.

JULIEN, R. (1974). Studies of ripeners on sugar cane. II. The distribution of dry matter and sucrose in the sugar cane stalk following treatment with ripener Mon 045. *Expl Agric.* **10** : 123-129.

Mon 045 at rates of 4 and 6 kg/ha increased total dry matter in the stem of the sugar cane variety M 13/56, optimum response occurring at 9 to 12 weeks after application. The increase in dry matter was mainly due to an increase in sucrose, since the chemical had no effect on fibre and decreased reducing sugars. The site of action appears to be in the top 16 internodes. Possible modes of action of the chemical are discussed.

JULIEN, R., SOOPRAMANIEN, G.C. & DELAVOUET, G. (1974). Effect of plant age and time of harvest on yield of six sugar cane varieties grown in contrasting environments. *Revue agric. sucr. Ile Maurice* **53** : 138-148.

The effects of plant age and time of harvest were investigated in varieties M 93/48, M 442/51, M 377/56, M 13/56, M 351/57 and S 17 grown in five contrasting environments. Both factors were shown to affect fresh weight yield and IRSC; time of harvest was dominant while age had maximum effect late in the season. Strong interactions on sugar yield were found between date of harvest and environment for the six varieties. The agronomic implications of these results are discussed.

JULIEN, R., SOOPRAMANIEN, G.C. & LORENCE, D. (1974). Juvenility, senility, climate and flowering in *Saccharum. Proc. int. Soc. Sug. Cane Technol.* **15** : 984-990.

In the two commercial varieties S 17 and M 351/57 and also in *S. Spontaneum* var. 51 NG 2, a minimum number of mature internodes was necessary for floral induction, although varietal differences were observed. Old canes with a high number of mature internodes failed to be induced, suggesting an optimum number of internodes for induction. Absence of flowering in the commercial varieties at one site was associated with high maximum day temperatures.

LI PI SHAN, L. (1974). Results of some sprinkler distribution tests. *Revue agric. sucr. Ile Maurice* **53** : 193-197.

Results of some sprinkler distribution tests effected on the Target Junior sprinkler are presented. The uniformity of application was assessed using Christiansen's cœfficient of uniformity and a modification of Dan's zone analysis.

PILLAY, A.R. MAMET, J.R. & VAUDIN, J. (1974). Effects of planting date and seasonal rainfall on yield of groundnuts in Mauritius. *Revue agric. sucr. Ile Maurice* **53** : 74-78.

Effect of planting date and rainfall on groundnut yields in different localities were studied in October-November 1970 (fortnightly sowings), and November 1971-October 1972 (monthly sowings). Planting from October to January gave high yields of kernels; however, planting Shulamit by mid-October and "Cabri" by early November should be preferred. Moisture stress during the period of intense flowering and pod development (65-96 days after sowing) reduces yield considerably.

RICAUD, C. (1974). Factors affecting yellow spot development, its control and effect on cane and sugar yields. *Proc. int. Soc. Sug. Cane Technol.* **15** : 354-364.

In Mauritius, rainfall and relative humidity were the predominant factors influencing the intensity of yellow spot disease and the span of its infection cycle, which usually lasts from end January to July. Control with Benomyl sprayed at 270 g a.i./1000 l/ha was of too short a duration for practical purposes. Spraying at intervals of three weeks, although not giving perfect control, enabled a fair assessment of the effect of the disease on cane and sugar yields in variety B 3337. Sucrose content was affected mainly in cane harvested early, that is, just after the end of the infection cycle; in late harvests, cane yield was more severely depressed.

RICAUD, C. (1974). Problems in the diagnosis of ratoon stunting disease. *Proc. int. Soc. Sug. Cane Technol.* **15** : 241-248.

Several factors, such as varietal characteristics, weather, physiological status of the plant, and the presence of other diseases affect the expression of the macroscopic symptoms of ratoon stunting disease. Diagnostic symptoms are therefore often unreliable and special methods of diagnosis, namely, inoculation into indicator varieties and chemical tests, have been adopted or attempted. Chemical diagnosis has not proved satisfactory. Purification of the virus with the intention of obtaining a more specific test has met with limited success. The use of heat treatment for detecting the effects of the disease necessitates careful experimentation. Owing to the difficulties of diagnosis, reports of the existence of the disease in various territories should be considered with circumspection and isolation of the causal agent is considered to be necessary before the presence of the disease in different countries can be confirmed.

RICAUD, C. & FELIX, S. (1973). La production des semences saines de pomme de terre à Maurice. *Revue agric. sucr. Ile Maurice* **52** : 214-220.

Increasing cost of imported seed potatoes has necessitated the launching of a scheme for seed production in Mauritius. An analysis of disease factors influencing seed production is presented. Results obtained in trials as well as in pilot plantations have shown that local production of seed can be successful. Although cool-stored seeds gave a larger proportion of smaller tubers than imported seed, the yield of commercial-grade tubers was not inferior.

RICAUD, C. & SULLIVAN, S. (1974). Further evidence of population shift in the gumming disease pathogen in Mauritius. *Proc. int. Soc. Sug. Cane Technol.* **15** : 204-209.

Some cane varieties that had been tested and considered resistant to a new strain of the gumming disease bacterium, which had caused an epidemic in Mauritius in 1964, proved highly susceptible when brought into cultivation, indicating further changes in the bacterial population. Differences in pathogenicity between the old strain, present on noble canes, and the strain responsible for the epidemic were confirmed experimentally on three type varieties. Furthermore, a strain x variety interaction was found, indicating a difference in virulence between the two strains and the existence of vertical resistance to the old strain in variety M 147/44. Such differences were not found between isolates from varieties recently affected by the disease, including those obtained from infected M 147/44. The problem of population shift in the pathogen is discussed in terms of recent concepts and the implications to the variety selection programme are outlined.

ROSS, L., NABABSING, P. and WONG YOU CHEONG, Y. (1974). Residual effect of calcium silicate applied to sugarcane soils. *Proc. int. Soc. Sug. Cane Technol.* **15 :** 539-542.

Calcium silicate applied to low silicon soils at planting gave annual increases of cane yield over a 6 year cycle. The higher level of 14.2 tons/ha was uneconomical over that period but the lower level of 7.1 t/ha proved to be generally profitable. A net return from the application of calcium silicate can be expected if the total silica level in the third leaf lamina is below 1.4 SiO_2% dm or if the acid-soluble soil Si is below 77 ppm. Although the amount of applied Si not recovered in the plant or in the soil was high, it would appear from results of soil and leaf analysis that further yield increases could be expected from the silicate already applied.

ROUILLARD, G. (1974). Histoire des domaines sucriers de l'Ile Maurice. *Revue agric. sucr. Ile Maurice.* **53 :** 27-56 (Rivière Noire), 149-184 (Savanne).

The settlement of the districts of Rivière Noire and Savanne is described. Historical notes on the 27 and 40-odd mills, respectively, that have worked in the districts are given. Of these, only Médine is still active in Rivière Noire, and Bel Ombre, St. Félix, Union & Britannia in Savanne.

TURSAN D'ESPAIGNET, J. (1974). Review of performance of sugar factories in 1973. *Revue agric. sucr. Ile Maurice* **53 :** 19-26.

The performance of sugar factories in 1973 is discussed in relation to equipment installed.

TURSAN D'ESPAIGNET, J. and RIVALLAND, J.F.R. (1974). Operation of a Saturne diffuser in Mauritius. *Proc. int. Soc. Sug. Cane Technol.* **15 :** 1499-1511.

The difficulties encountered with the operation of the Saturne diffuser installation are reviewed. The measures taken to overcome these difficulties as well as others aimed at improving the extraction performance of the installation are described. Results of experimental work undertaken to assess the general performance of the milling-diffusion plant are given.

VIGNES, E.C. (1974). Notes on cane starch and its determination. *Proc. int. Soc. Sug. Cane Technol.* **15 :** 1288-1295.

Cane starch was isolated and some of its physico-chemical properties compared with those of other common starches. Due to many variable factors, it is believed that figures published in the literature for starch content of sugars are not accurate and search for a better method of analysis is advocated.

VIGNES, E.C. (1974). Some notes on the determination of water in molasses by the Karl-Fischer method. *Z. Zuck. Ind.* **24 :** 121-123.

A technique for the determination of moisture in molasses using an automatic titration is described. Precision and reproducibility were statistically examined and found satisfactory. The method is considered rapid and accurate enough for estimating water in molasses.

WILLIAMS, J.R. (1974). Entomological parasite-host records from Mauritius. *Occ. Paper Maurit. Sug. Ind. Res. Inst.* **28 :** 33 pp.

This compilation brings together for the first time records of insects parasitizing other insects in Mauritius and is primarily intended for those engaged in, or interested in, the biocontrol of pest insects. A reference citation is given for each record and the listing is critical, erroneous records being omitted or amended according to the most recent published works.

WILLIAMS, J.R. (1974). The storage of maize. *Tech. Circ. Maurit. Sug. Ind. Res. Inst.* **40 :** 8 pp (mimeo).

The basic principles and methods of safe storage of maize to prevent deterioration from insect attack and other causes are described concisely in this guide to planters.

WONG YOU CHEONG, Y., D'ESPAIGNET, J.T. and DEVILLE, P.J., SANSOUCY, R. and PRESTON, T.R. (1974). The effect of steam treatment on cane bagasse in relation to its digestibility and furfural production. *Proc. int. Soc. Sug. Cane Technol.* **15 :** 1887-1894.

The digestibility of cane bagasse was increased by steam treatment. High pressures and short durations of treatment were sufficient to yield products with digestibilities as high as that of Setaria grass (*Setaria sphacelata*). The steam pressure required was about 14 to 15 bar for 10 minutes. Total acids and furfural production increased with steam pressure and duration of treatment, with yields of furfural higher than 3% of dry bagasse being obtained. The digestibility of the water-insoluble fraction remaining after steam treatment was not increased.

Acknowledgements

It is once more a pleasure to express my gratitude to the Sugar Estate Managers and Staff for the fruitful co-operation so readily given with special mention of the Estate Agronomists for their assistance in the conduct of field experiments. The collaboration received from the Ministry of Agriculture, Natural Resources and Environment has, as usual, been invaluable. Finally, the advice and support of the Chairman and Members of the Executive Board are acknowledged with gratitude as well as the loyalty and efficiency of the Staff, the more so in a year when the Institute had to organize the Post-Congress Tour of the I.S.S.C.T.

Director

Technical Report

GENERAL

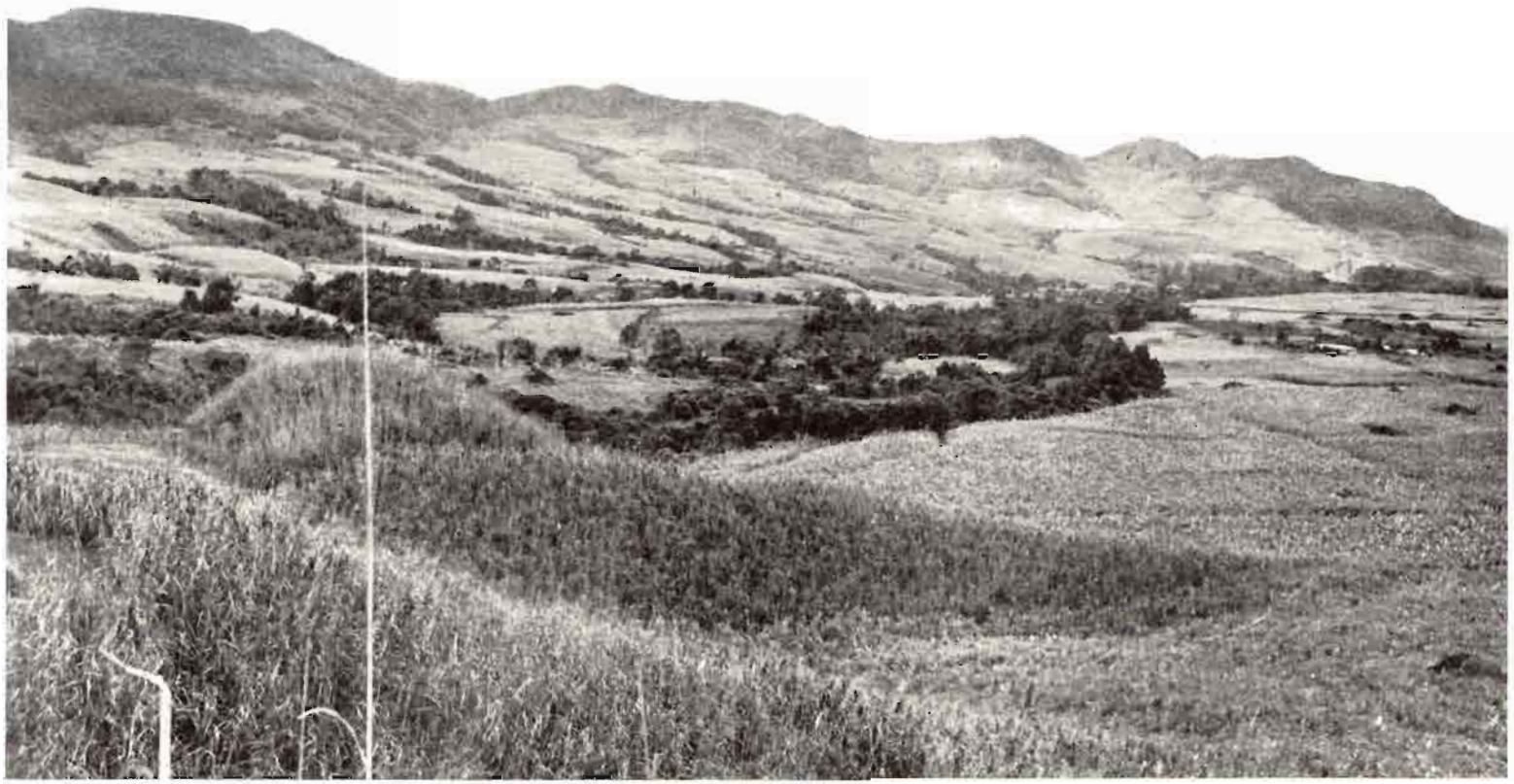


Plate I. View of the landscape facing southeast to Mount Surinam, showing in the foreground, on the right, the Central Late Lava Plateau (land unit 5.6), on the left, and comprising the footslopes of the mountain, the Lower Mountain Slopes (land unit 10.2), and in the back-ground, the old Volcanic Mountains (land unit 11.1). Land units reflect the diversity of the terrain and the agricultural land suitability.

TECHNICAL REPORT

GENERAL

Land use recommendations

A study was carried out, on behalf of the Ministry of Agriculture, Natural Resources and the Environment, on the availability of land that would be suitable for rice cultivation. The study was based on aerial photo-interpretation and data on slope, soil and climatic characteristics. Some 4,300 hectares of land, mostly in the dry western sector of the island, were found to be suitable for paddy rice if water could be provided.

The soil survey at Joli Bois, Savannah S.E., started in 1973, was interrupted but is to be continued in 1975.

A study to intensify and diversify land usage at Mon Désert Alma S.E. was initiated. Maps showing the present use of land were prepared and the first stage of the study was completed with the issue of estate section maps giving recommendations for development of presently unutilised land. An initial estimate indicated that about 1,500 hectares are available for production of foodcrops in sugar cane fields either in the interlines of cane or between cane cycles.

Areas suitable for grazing of livestock, for fodder production and deer management were estimated for the Deer Sub-Committee of the National Food Production Committee. A gross area of some 17,000 hectares was considered suitable for grazing and fodder production, and some 45,000 hectares for deer management.

At the request of the Ministry of Co-operatives and Co-operative Development, the potential of vacant Crown Lands and Pas Géométriques for agricultural exploitation was assessed and the results presented in a report accompanied by 1 : 25,000 scale maps of the areas involved.

The land appraisal study of some 1,690 hectares at Chamarel was completed although field trials are continuing. The final report presents data on the physiography, geology, landform, soils, climate, land use alternatives and potential productivity of the area. Four maps, scale 1 : 7,500, accompany the report. Of the total of 720 hectares of forest land available for development, about 290 could be developed for sugar cane and the rest used for productive or protective forestry, for grazing of livestock, or for fodder production. Productivity of land at Chamarel is closely related to the nature of the parent material (basalt or volcanic ash) and to slope-form.

Assistance was given to two experts of the International Union for the Conservation of Nature, World Wildlife Fund, in delimiting and mapping from aerial photographs the marine habitats of Flat Island and Baie de l'Arsenal, Mauritius. The accuracy with which it was found possible to interpret the aerial photographs would seem to offer considerable scope for study of lagoon and reef structure.


SUGAR CANE

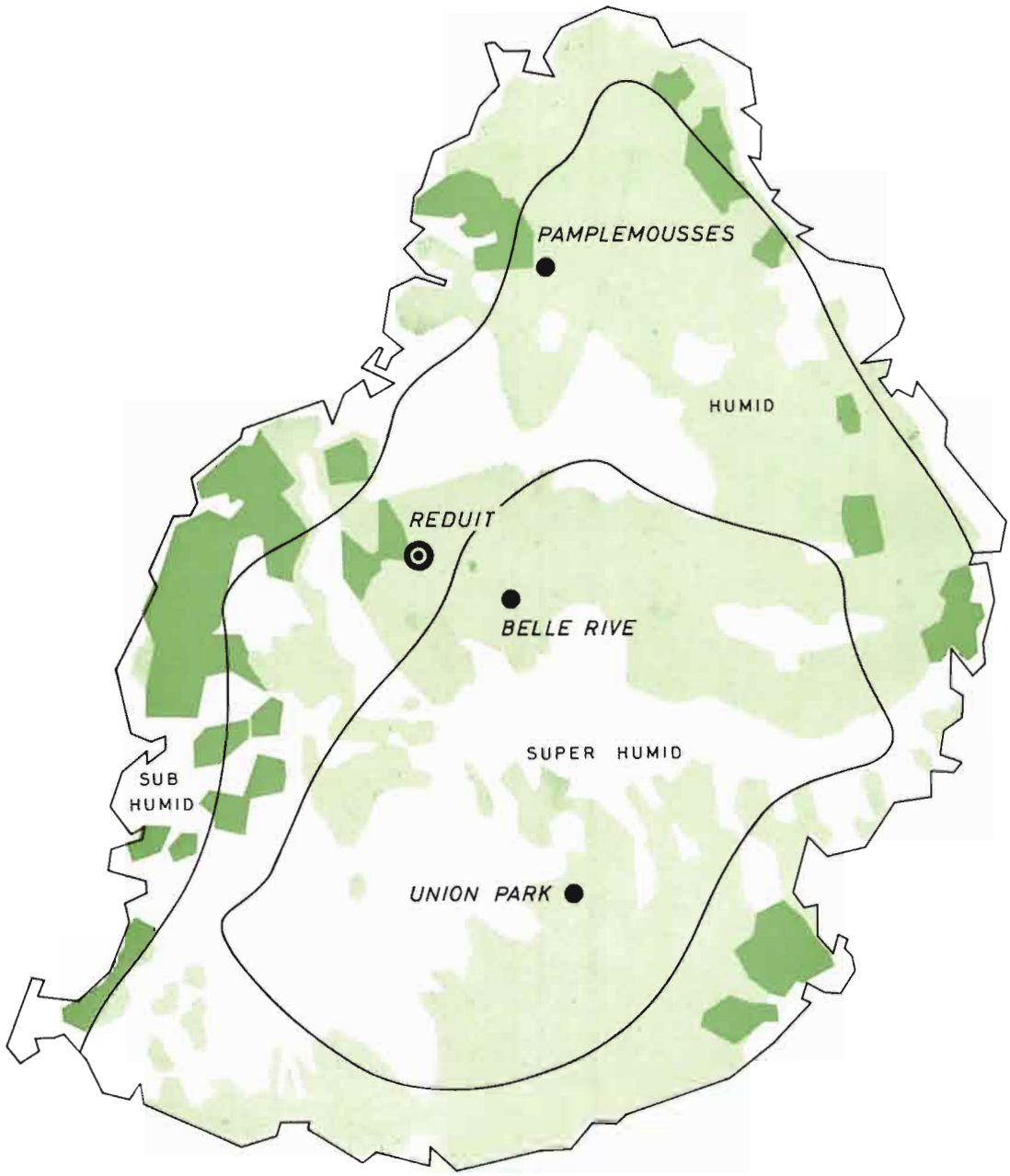


Fig. 1 The three main climatic zones, the sugar cane areas (light green, non irrigated; dark green, irrigated), and the location of Sugar Experiment Stations.

General description of sugar cane sectors in Mauritius

Sector	*West*	*North*	*East*	*South*	*Centre*
Districts	Black River	Pamplemousses & R. du Rempart	Flacq	Grand Port & Savanne	Plaines Wilhems & Moka
Orientation	Leeward	—	Windward	Windward	—
Physiography	Flat & sloping	Lowlands	Flat & sloping	Flat & sloping	Plateau
Geology	Late lava — Pleistocene				
Petrology	Compact or vesicular doleritic basalts and subordinate tuffs				
Pedology	Soil Families				
Low Humic Latosol	«Richelieu»	«Richelieu» «Réduit»	«Réduit» «Bonne Mère»	«Réduit»	«Réduit» «Ebène»
Humic Latosol	—	«Rosalie»	—	«Riche Bois»	«Riche Bois»
Humic Ferruginous Latosol	—	—	«Sans Souci»	«Belle Rive» «Sans Souci» «Midlands» «Chamarel»	«Belle Rive» «Sans Souci» «Midlands»
Latosolic Reddish Prairie	«Médine»	«Labourdonnais» «Mont Choisy»	«Mont Choisy»	«Labourdonnais» «Mont Choisy»	«Médine»
Latosolic Brown Forest	—	—	«Rose Belle»	«Rose Belle» «Bois Chéri»	«Rose Belle» «Bois Chéri»
Dark Magnesium Clay	«Lauzun» «Magenta»	«Lauzun»	—	—	—
Grey Hydromorphic	«Balaclava»	«Balaclava» «St. André»	«Balaclava»	—	—
Low Humic Gley	—	—	«Valetta»	—	«Valetta» «Petrin»
Lithosol	—	«Melleville»	«Pl. des Roches» «Melleville»	«Melleville»	—
Altitude	Sea level-275 m	Sea level - 175 m	Sea level-350 m	Sea level-350 m	275 - 550 m
Humidity province	Sub-humid	Sub-humid to humid	Humid to super-humid		
Annual rainfall, mm. range	1125 (750-1500)	1400 (1000-1900)	2400 (1500-3200)	2300 (1500-3200)	2600 (1500-3800)
Months receiving less than 50 mm.	June to October	September to October	None		
Average temperature °C — *Jan.*	27.0°	26.5°	25.5°	25.0°	23.5°
Average temperature °C — *Jul.*	21.0°	20.5°	19.5°	19.0°	17.5°
Cyclonic winds, exceeding 50 km/h during 1 hour	December to May				
Irrigation (area in ha)					
Overhead — intensive	1885	1698	683	1125	407
Overhead — occasional	159	945	—	824	—
Surface — intensive	3165	568	137	986	42
Surface — occasional	407	426	168	358	546
Area (1000 ha) — Total	24	38	30	68	27
Area (1000 ha) — Under cane	6	23	22	26	10
Cane production, 1974 (1000 tonnes)	395	1393	1518	1858	800
Sugar production, 1974 (1000 tonnes)	50	161	176	219	91

SUGAR CANE

The 1974 crop

Weather during the growing period of the 1974 sugar cane crop was characterised by an absence of cyclonic disturbances and consequently a fairly considerable rainfall deficit in all districts. The rainfall in November was only 14 mm, which is very close to the lowest (13 mm) ever recorded since 1875. Maximum temperatures were above normal in November and December, normal in in January and May, and below normal in the other months. Minimum temperatures were below normal throughout the season.

During the maturation period, rainfall was below normal except in August when it was above normal. Mean minimum temperatures were slightly below normal. Conditions were therefore generally conducive to good quality of the harvested cane.

On the whole, weather was favourable and resulted in the second best year, after 1973, for sugar production. The miller-planters established a record sugar production of 10.26 tonnes per hectare.

Details of the 1974 crop, of weather during the crop year, and of the varieties cultivated are given in Table 1 and Figs. 2-6.

Table 1. The 1974 Crop

	1974		*1973*	
Area cultivated, hectares*	86,691	(205,431)	87,366	(207,029)
Area harvested, hectares*				
Miller-Planters	43,904	(104,038)	43,660	(103,459)
Planters	35,977	(85,258)	37,289	(88,363)
Total	79,881	(189,296)	80,949	(191,822)
Weight of canes, tonnes	5,963,655		6,242,631	
Tonnes cane per hectare*				
Miller-Planters	87.9	(37.1)	88.4	(37.3)
Planters	58.3	(24.6)	64.0	(27.0)
Average, Island	74.7	(31.5)	77.0	(32.5)
Commercial sugar recovered % cane	11.68***		11.51**	
Tonnes sugar per hectare				
Miller-Planters	10.26	(4.33)	10.17	(4.29)
Planters	6.80	(2.87)	7.37	(3.11)
Island	8.72	(3.68)	8.89	(3.75)
Total duration of harvest (days, Sundays and public holidays excluded)	157		163	
Sucrose % cane	13.26		13.05	
Fibre % cane	12.77		13.27	
Tonnes sugar 98.5° pol	698,201		719,928	

* Equivalent figures for arpents are given in brackets

** Equivalent to 8.7 tonnes of cane per tonne of sugar

*** Equivalent to 8.6 tonnes of cane per tonne of sugar

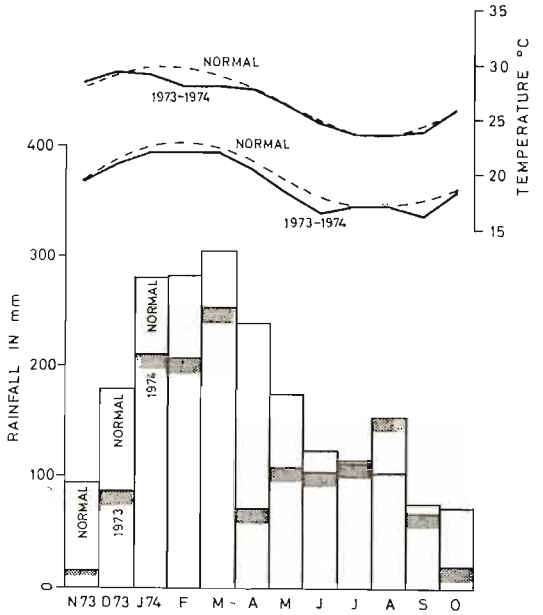


Fig. 2. Average rainfall, and maximum and minimum temperatures, over the cane area in 1974 compared to normal.

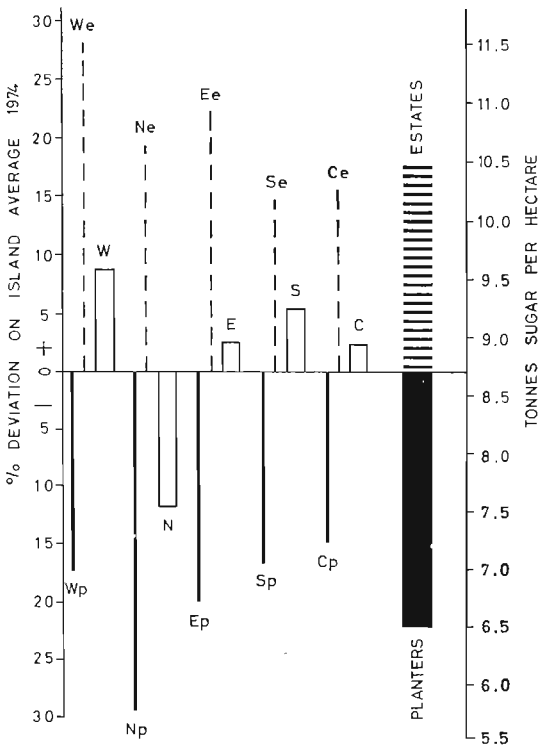


Fig. 3. Relative yields of sugar/ha in different sectors. Average island yield 8.72 tonnes of 98.7° pol sugar/ha (3.68 tonnes/arp.) Plain lines, planters; broken lines, estates; columns, sector averages.

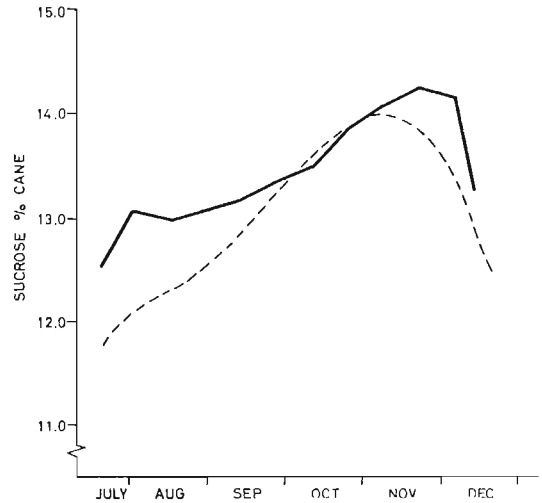


Fig. 4. Variation in sucrose % cane during the harvest season of 1974 (plain line) compared to the 1969-1973 average (broken line).

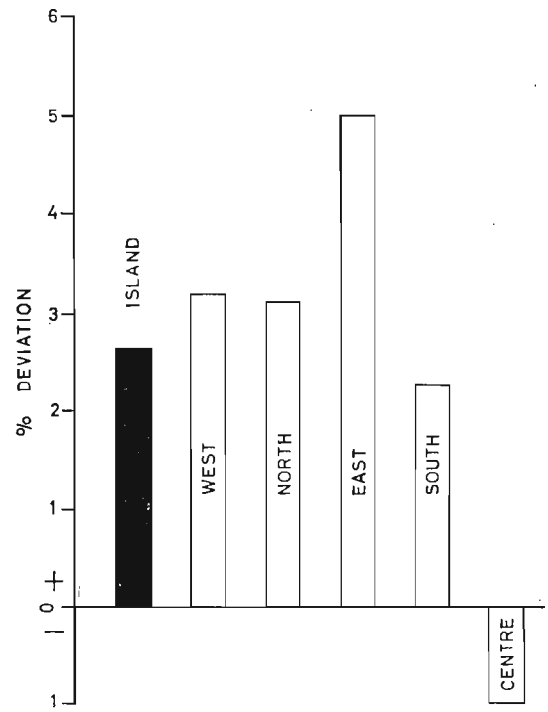


Fig. 5. Sugar manufactured % cane in 1974 for the various sectors expressed as % deviation from the 1969-1973 average.

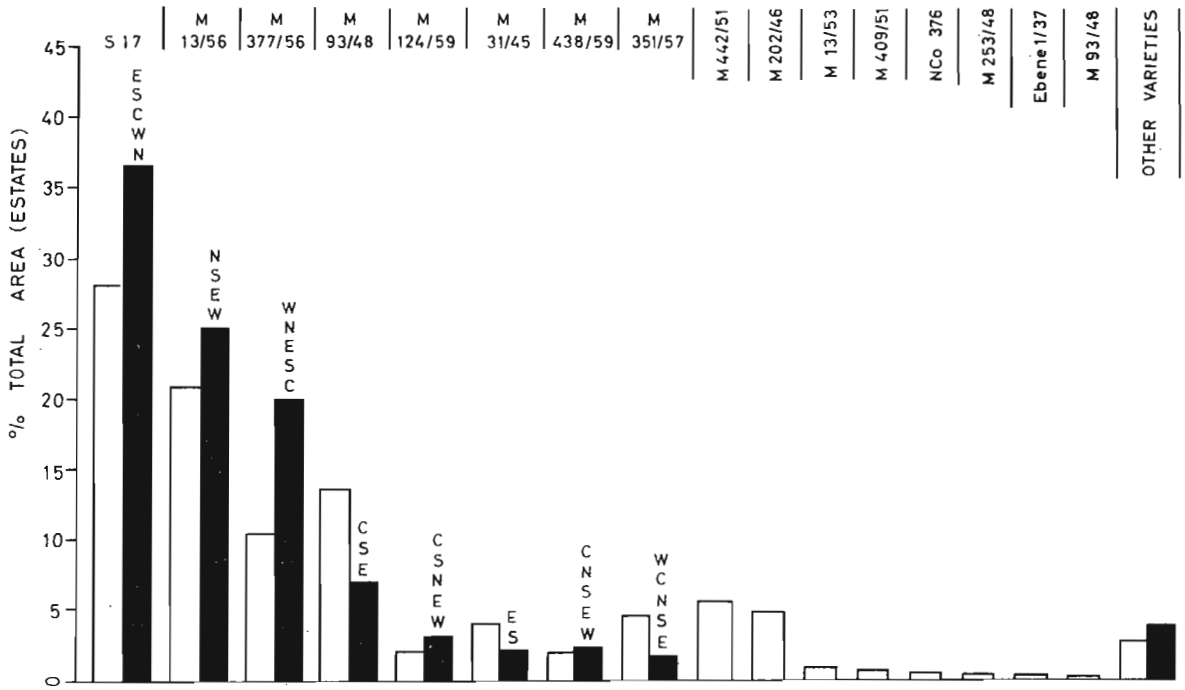


Fig. 6 Varietal trend in 1974 as illustrated by area under cultivation (plain columns) and area planted during the year (black columns). Letters denote sectors arranged in descending order of magnitude of plantations.

BREEDING AND VARIETIES

Crossing

The crossing period lasted from May 11th to August 23rd, it being continued a month longer than usual to include more late flowering varieties as parents in the crossing programme. The number of crosses made was 1,506 and they involved 973 combinations and 272 parents, the latter comprising 114 clones as male, 140 as female, and 18 as both male and female. The nobilisation programme accounted for 269 crosses involving 220 combinations. As in previous years, the number of seedlings produced exceeded requirements and an initial random discard was accordingly made from every combination that yielded more than about 750 seedlings.

Selection

A summary of the preliminary phases of variety testing in 1974 is given in Table 2.

Table 2. Summary of variety testing in 1974. Preliminary phases

	Stage	*Series*	*Crop cycle*	*Different varieties*	*Total locations*
	(i) Stages measured & selected				
1.	Seedling	M/72	Plant cane	55,393	20,470
2.	Bunch Selection Plot	M/71	Plant cane	17,331	17,331
3.	Propagation Plot	M/69	1st ratoon	2,145	3,449
4.	1st Selection Trial	M/66	2nd ratoon	167	184
	,, ,,	Foreign	2nd ratoon	18	36
		Total measured & selected		*75,054*	*41,470*
	(ii) Stages measured				
3.	Propagation Plot	M/70	Plant cane	2,298	3,609
4.	1st Selection Trial	M/68	Plant cane	113	120
	,, ,,	Named	Plant cane	1	1
	,, ,,	M/67	1st ratoon	81	86
	,, ,,	M/66	1st ratoon	83	88
	,, ,,	Foreign	1st ratoon	27	54
		Total measured		*2,603*	*3,958*
	(iii) Stages planted				
1.	Seedling	M/73		63,245	18,263
2.	Bunch Selection Plot	M/72		17,780	17,780
3.	Propagation Plot	M/71		2,893	5,011
4.	1st Selection Trial	M/69		82	90
5.	1st Multiplication : MI	M/66		38	38
	,, ,,	Foreign		2	2
		Total planted		*84,040*	*41,184*
		Grand Total		*161,697*	*86,612*

About 2.50 ha (6.0 arp) of multiplication plots containing 74 varieties and 8 controls were established at Médine. Four varieties were also planted in the M3 nurseries* and occupied about 1.25 ha (3.0 arp). All planting material used for M1 and M2 received a short hot water treatment (52°C/20 min) while material for M3 was given the long treatment (50°C/2 hr). The total area of M3 nurseries was planted in June, the setts being obtained from M1 and M2. Four varieties were planted in M4 nurseries and four in M5 nurseries in the regular series. Further, all varieties that were undergoing trial at the T3 stage and had not been multiplied were planted in M4 nurseries. This brought the system up-to-date so that, in future, all varieties considered for release will have been planted in M5. The areas planted to each variety in the regular series at various sites are shown in Table 3.

Table 3. Areas (ha) of M4 & M5 Nurseries established on Estates in 1974

Nursery Site	*M4*				*M5*				*Total*
	M1595/61	*M574/62*	*M1227/62*	*M2370/62*	*M356/53*	*M144/56*	*M496/59*	*Triton*	
Beau Champ	0.21	0.21	0.22	0.21	2.11	2.11	1.63	2.28	8.98
Belle Vue	0.26	0.32	0.29	0.28	3.18	3.96	4.39	2.19	14.87
Bénarès	0.17	0.15	0.13	0.17	1.75	1.69	2.11	1.82	7.99
F.U.E.L.	0.13	0.13	0.13	0.13	—	2.05	1.24	2.32	6.13
Médine	0.12	0.12	0.13	0.12	—	1.04	1.39	1.37	4.29
Mon Désert	0.19	0.24	0.19	0.27	2.19	3.97	4.04	1.27	12.36
Mon Trésor	0.13	0.19	0.15	0.15	1.73	2.03	1.26	1.22	6.86
Riche-en-Eau	0.15	0.15	0.15	0.15	1.39	1.48	1.48	1.56	6.51
TOTAL	1.36	1.51	1.39	1.48	12.35	18.33	17.54	14.03	67.99

1st Testing : T1

Two series of 4 trials each were planted in 1974. In each series the trials were laid out as 4 × 5 rectangular lattices with 3 replications and included 14 varieties and 6 controls. Table 4 gives details of varieties undergoing testing at stage T1.

Table 4. Varieties planted in 1st test : T1

Varieties	**1971**	**1972**	**1973**	**1974**	*Total*
M 61	1	—	—	—	1
M 62	25	—	—	—	25
M 63	—	14	13	—	27
M 64	—	—	9	28	37
Foreign	2	4	8	—	14
Total	*28*	*18*	*30*	*28*	*104*
No. of series	2	1	2	2	7
No. of trials	8	4	8	8	28

* A Flow Chart depicting the Final Phase of testing and multiplying varieties is given in Ann. Rep. 1972.

2nd Testing : T2

One series of 4 trials was planted, the trials being laid out as 4 × 4 balanced lattices with 5 replications and including 10 varieties. Table 5 gives details of varieties undergoing testing at stage T2.

Table 5. Varieties planted in 2nd test : T2

Varieties	1971	1972	1973	1974	*Total*
M 54	1	—	—	—	1
M 55	2	—	—	—	2
M 57	3	—	—	—	3
M 58	2	—	—	—	2
M 59	6	—	—	—	6
M 60	6	2	—	—	8
M 61	1*	4	1	1	7
M 62	—	1	8	3	12
M 63	—	—	—	2	2
Foreign	1	2	1	4	8
Total	*22*	*9*	*10*	*10*	*51*
No. of series	2	1	1	1	5
No. of trials	8	4	4	4	20

* Variety M 907/61 was planted in 2nd test in 1969 and again in 1971

3rd Testing : T3

No trials were planted at this stage. Table 6 gives details of varieties undergoing testing at stage T3 and Table 7 gives details of all varieties being tested in the final phase.

Table 6. Varieties planted in 3rd test : T3

Varieties	1971	1972	1973	1974	*Total*
M 53	—	1	—	—	1
M 54	—	1	—	—	1
M 57	—	2	—	—	2
M 59	—	1	2	—	3
M 60	—	—	2	—	2
M 61	—	—	1	—	1
Foreign	—	—	—	—	—
Total	—	*5*	*5*	—	*10*
No. of series	—	2	2	—	4
No. of trials	—	18	20	—	38

Table 7. Varieties in the final phase of testing

Varieties	1963—1970	1971	1972	1973	1974	*Total*
Planted T1	—	28	18	30	28	104
Under testing at later stages	40	—	—	—	—	40
Total	*40*	*28*	*18*	*30*	*28*	*144*

Trials planted in 1970 at the T1, T2 and T3 stages were harvested in 3rd ratoons. A summary of results is presented in Table 8.

Table 8. Varieties planted in 1970 at stage T1, T2 & T3 harvested in 3rd ratoon

Varieties planted 1970	43
Varieties previously released	4
Varieties discarded	26
Varieties released 1974	2
Varieties still under selection	11

Varieties still under selection

Varieties	*Parent*			*Gumming Disease rating**	*Further testing (year)*		*Multiplication (year)*	
					T2	*T3*	*M4*	*M5*
M 84/57	B 34104	x	M 213/40	P	70	72	74	—
M 335/57	E 1/37	x	M 147/44	P	70	72	74	—
M 743/60	N Co 376	x	M 147/44	P	72	—	—	—
M 344/61	M 99/48	x	M 147/44	O	72	—	—	—
M 433/61	M 376/54	x	R 397	O	74	—	—	—
M 907/61	M 202/46	x	47 R 2777	O	69	70	72	—
					71	73	74	
M 92/62	E 1/37	x	M 462/54	O	72	—	—	—
B 42231	B 3354	x	CP 28-11	P	74	—	—	—
Co 1177	Co 677	x	POJ 2961	O	72	—	—	—
Co 1186	Co 312	x	Co 617	P	73	—	—	—
Triton	Co 270	x	Eros	P	72	—	73	74

* O = Indications of susceptibility; reaction of variety needs confirmation
P = No indications of susceptibility

Varieties discarded

CB 38-22	M 69/56	M 158/58	M 566/61
N 50-211	M 144/56	M 1445/59	M 697/61
N 52-219	M 198/56	M 377/61	M 125/62
M 16/55	M 225/56	M 382/61	M 220/62
M 75/55	M 322/56	M 452/61	M 232/62
M 255/55	M 325/56	M 482/61	
M 63/56	M 315/57	M 542/61	

Release of varieties

A recommendation that varieties B 51129 and M 356/53 be released for cultivation was unanimously accepted by the Cane Release Committee in December. The Board of Agriculture, Fisheries and Natural Resources concurred with the Committee and legislation has been passed to add these varieties to the approved list of commercial varieties. The main characteristics of the varieties are as follows :

B 51129 : B 45170 × B 41227

This variety is very rich, although probably slightly less so than S 17 and M 356/53. It appears suitable for harvest during both halves of the crop period and is best adapted to Humic Latosols and Low Humic Latosols.

The variety was imported from Barbados in 1962. It had been planted at the T3 stage in 1970 when it was black-listed, having shown some susceptibility to gumming disease. This decision was revised in accordance with the present less rigorous rating of susceptibility that has been adopted for the disease.

M 356/53 : E 1/37 × Co 209

This variety is very rich, almost as rich as S 17, and it appears particularly suitable for the soil groups of the super-humid area, particularly the Humic Ferruginous Latosols. It appears that the variety can be profitably harvested during both halves of the crop period.

Planting material of both varieties will be obtained for distribution from the eight nursery sites established in 1973. Material of M 356/53, which was planted in M5 during the year, will be available during the first half of 1975 but material of B 51129 cannot be made available for distribution until 1976.

Approved cane varieties

The cane varieties officially proclaimed for commercial cultivation as at 26th February 1975, are given below :

Varieties	*Proclamation*	*Cane Release Advisory Committee Meeting*
B 37161	12 (*1953*)	26. 3.53
B 37172	12 (*1953*)	26. 3.53
B 51129	3 (*1975*)	16.12.74
E 1/37	5 (*1951*)	3. 4.51
E 50/47	18 (*1962*)	29.12.61
M 134/32	10 (*1946*)	1937
M 134/32 striped	5 (*1956*)	16.12.55
M 134/32 white	5 (*1956*)	16.12.55
M 31/45	5 (*1956*)	13.12.55
M 202/46	13 (*1960*)	8.12.59
M 93/48	13 (*1960*)	8.12.59
M 99/48	20 (*1966*)	12. 2.65
M 253/48	18 (*1962*)	29.12.61
M 409/51	20 (*1966*)	24. 5.66
M 442/51	20 (*1966*)	18. 2.64
M 13/53	20 (*1966*)	24. 5.66
M 356/53	3 (*1967*)	16.12.74
M 13/56	20 (*1966*)	24. 5.66
M 377/56*	3 (*1967*)	15.12.66
,,	8 (*1972*)	—
,,	4 (*1974*)	18. 1.74
M 351/57	8 (*1972*)	18. 9.70
M 124/59	8 (*1972*)	29.12.71
M 438/59	8 (*1972*)	29.12.71
N Co 376	20 (*1966*)	24. 5.66
S 17	8 (*1972*)	28. 8.70

* Approved for commercial cultivation in 1967, withdrawn in 1972, approved again in 1974.

Characteristics of major varieties

The broad characteristics of the major commercial varieties are as follows :

Variety	*Sugar content, (general level)*	*Optimum harvest period for sugar/unit area*
M 31/45	Average	Late
M 93/48	Low	Late
M 356/53	Very high	None
M 13/56	Low	None
M 377/56	Average	None
M 351/57	Very low	Late
M 124/59	Average	Late
M 438/59	Average	Early
B 51129	High	None
S 17	Very high	None

It must be stressed that the optimum harvest period is only indicative as interactions occur with different soil types.

With the additions to the approved list of cane varieties for commercial cultivation, the general suitability of the major varieties for different regions, which are defined by soil type, is being reassessed concurrent with comprehensive experiments on maturation. The aim is to determine more precisely the suitability of the major commercial varieties to the different soil types and the optimum times for their harvest.

Quarantine and export of varieties

The following varieties received from different countries in 1972 were released from the quarantine greenhouse and successfully established in open quarantine after hot air treatment of the planting material:

Country of origin	*Variety*
Barbados	B 5480, B 5992, B 6160, B 59162, B 55924, B 56014
Fiji	Homer, Mali, Spartan, Waya
Hawaii	H 52-246, H 54-775, H 49-3945, H 50-2036, H 57-5174, H 59-3775
Rhodesia	M 382/41
From South Africa	L 76, N 6, N 7, N 8
Taïwan	F 157, F 161, F 164, F 166, F 167, F 170, F 172
U.S.A.	L 65-69

Forty-eight varieties were distributed to the following countries : Burundi (6), China (6), Rep. of Guinea (6) Hawaii (1), Pakistan (2), Seychelles (19), South Africa (2), Zaïre (6).

Miscellaneous

With the co-operation of the Data Processing Division of the Ministry of Finance, the results of trials at the Final Phase of testing were processed for the first time on a computer.

The Board decided to replace the existing data processing equipment and orders were placed for a 1901A Computer System.

AGRONOMY AND PLANT PHYSIOLOGY

Plant nutrition

Nitrogen and potassium

Owing to a considerable increase in the price of fertilisers, reduced rates of fertilisation were recommended during the year. These recommendations were, however, withdrawn following an increase in sugar prices.

Trials comparing sulphate of ammonia and calcium ammonium nitrate have shown (Table 9) that there is little or no difference between them in terms of cane and sugar yields. Although these trials have served their purpose, they are being continued to study the sulphur status of the soil as influenced by the treatments.

Table 9. Sulphate of ammonia v/s calcium ammonium nitrate

(Mean yields of V + 5 R)

Soil Group	*No. of sites*	*Mean of S of A*			*Mean of C A N*		
		TCH	*TSH*	*LeafN%*	*TCH*	*TSH*	*LeafN%*
LHL	2	91.2	9.56	2.00	90.8	9.58	2.05
HL	1	88.2	8.71	2.01	85.6	8.41	2.05
HFL	2	77.1	8.11	2.20	73.9	7.72	2.17
LRP	3	88.1	7.95	1.88	87.7	7.92	1.89
LBF	2	80.9	8.47	1.93	81.6	8.63	1.91

The trials laid down in 1973 to study the optimum levels of nitrogen and potassium to be applied to newly released varieties were harvested in plant cane in 1974.

Straight fertilisers were compared with complex fertilisers in field trials to confirm that the former, which are used in large amounts in the island, do not give inferior yields. Sugar yields and data on leaf analysis (Table 10) obtained from the trials showed no difference between the two practices.

Table 10. Compound v/s straight fertilizers — leaf analysis — 1st ratoon

(Mean of ten sites)

	Fertilizer	*%N*	*%P*	*%K*
CONTROL		1.72	0.200	1.14
Straight	1	1.81	0.204	1.18
Compound	1	1.81	0.206	1.22
Straight	2	1.92	0.212	1.26
Compound	2	1.92	0.213	1.25
Straight	3	1.98	0.218	1.32
Compound	3	1.98	0.216	1.30

The potassium trials laid down in 1971 were harvested in 2nd ratoon. Responses to potassium application were again obtained at sites with low soil potassium. Whilst the magnitude of the responses appeared to vary with the soil type, the optimum leaf K was in no instance below 1.20% dry matter. The amounts of potassium exported by the millable cane and the whole plant (i.e. millable cane + tops), expressed in kg K_2O per tonne cane, were calculated and showed the following trends :

(a) potassium exported increased with increasing rate of fertiliser additions, even when no response to K in terms of TCH or TSH was obtained;

(b) the same varieties planted on different soils exported different amounts of potassium. The lowest and highest values for the whole plant were both obtained with variety S 17 and were, respectively, 1.80 kg K_2O on Humic Ferruginous Latosol and 4.05 kg K_2O on Latosolic Reddish Prairie.

Pot experiments, using a Humic Latosol soil and rye-grass as the test plant, were carried out to investigate factors affecting K uptake from soils. It appeared that increasing Mg levels, but not increasing Ca levels, decreased K uptake. Exhaustive depletion of K in the soil led to increased manganese levels in plants.

Silicon

The calcium silicate trials laid down in different soil types (series 3/69 — 10/69 and 11/69 — 14/69) were discontinued. The results obtained have confirmed current views that silicate applications are only required when soil silicon is below the critical level of 77 ppm Si.

Trials replanted in 1973 were harvested in virgins in 1974. Calcium silicate applications made in 1967 were shown to be still highly effective, the cane yields from plots having originally received 14 tonnes of silicate per hectare being in the order of 30% more than those from untreated plots.

Soil acidity

Changes of soil pH following additions of lime were measured for different soils. Results showed that the shape of titration curves varies with the type of soil and that some soils, particularly those from Chamarel (HFL) and Bel Etang (LBF), require larger amounts of base to reach neutrality. This is due to the presence of aluminium, which at Chamarel, can reach a value of 4 m.e.% soil.

Although soil acidity is corrected in practice by the application of coral sand or lime, factors regulating the acidity of local soils are little understood and require further study.

Table 11. Effect of continuous cane cropping on soil properties

Locality	*Soil type*	*Depth (cm)*	*O.M.%*		*B.S.%*		*C/N*	
			Scrub	*Cane*	*Scrub*	*Cane*	*Scrub*	*Cane*
Réduit	L2	0 - 15	6.72	2.56	57.0	31.0	9.3	6.7
		15 - 30	2.88	1.92	44.4	28.1	7.6	6.5
		30 - 45	1.60	1.28	40.2	25.2	7.2	5.7
Yemen	M2	0 - 15	5.12	2.88	80.1	79.4	10.6	9.8
		15 - 30	3.20	2.24	82.5	79.7	9.3	8.7
		30 - 45	1.92	1.60	88.5	81.8	9.3	7.2

Effect of continuous cane cropping on soil properties

Studies were initiatd on the physical and chemical changes that result in soils from continuous cane cultivation. This work has been motivated by the impending mechanisation of cultural operations and the effects, which it is intended to assess, that these will have on soil properties.

Preliminary data indicate that cane cultivation causes a decrease in organic matter content and base saturation, and a lowering of the C/N ratio. Typical results are shown in Table 11.

Soil analysis

Laboratory facilities were provided to estate chemists for the determination of phosphorus (1125 samples), silicon (619 samples), pH (1083 samples) and potassium (774 samples) in soils.

Foliar diagnosis

A total of 9726 determinations were made during analysis of 2605 samples, which came from the following sources :

Sugar cane leaf samples, estates and large planters	—	605
Sugar cane leaf samples, small planters	—	194
Sugar cane leaf samples, tops and millable cane sample from field trials	—	1,003
Samples from pot experiments	—	179
Tea leaf samples	—	624

Leaf sampling for foliar diagnosis was carried out as usual and the data obtained followed the pattern of previous years, there being high percentage deficiencies for potassium (46.9%) and nitrogen (38.3%) but not for phosphate (4.1%). Expressed in these terms, the figures for potassium and nitrogen appear alarming and investigations are under way to explain them.

A survey was made for the first time of the nutritional status of small planters' lands. Leaf samples were taken by the Extension Division of the Ministry of Agriculture, Natural Resources and the Environment, from 194 fields and analysed by the Institute's Soils and Plant Nutrition Division. The number of samples showing nitrogen, phosphorus and potassium deficiency represented about 21.6%, 10.3% and 48.0%, respectively, of the total number of samples received. The distribution curves had a broader base than those of estates and large planters, indicating that a greater number of small planters were either under-fertilising or over-fertilising. On the whole, however, the nutritional status of small planters' lands appeared satisfactory but the survey has to continue for several more years before firm conclusions may be drawn.

Irrigation

Overhead irrigation

The water treatments in the irrigation trials set up in 1972 are :

1. 19 mm (0.75") water/irrigation/week;
2. 38 mm (1.50") water/irrigation/2 weeks;
3. 57 mm (2.25") water/irrigation/3 weeks.

Thus, the same total amount of water is applied in all three treatments but the intervals between irrigations are different in each treatment.

Each trial occupies about four hectares and each treatment is replicated three times. The large size of the trials was unavoidable because the only equipment available is that currently used in field practice, such as Boom-O-Rain and Target Master Sprinklers.

Results are available at present from two harvests (plant and 1st ratoon) at St. Antoine on Latosolic Reddish Prairie, from one harvest (1st ratoon) at Palmyre on Latosolic Reddish Prairie (much of the plant crop was accidentally burnt), and from one harvest (plant) from two trials at Tamarin on Low Humic Latosol. Only one of the Tamarin trials is extant and it includes four levels of nitrogen fertilisation, the lowest being 50 kg N/ha. This trial replaced the other, which had only 2 replicates and was harvested in plant cane last year, i.e. in 1973, and then discontinued.

At St. Antoine (Table 12), treatments 1 and 2 gave significantly better cane yields for the plant crop than treatment 3, but sugar yields were not significantly different. There was no significant difference between treatments in the 1st ratoon crop. At Palmyre also (Table 13) there was no significant difference between treatments in 1st ratoons.

Table 12. Irrigation trial at St. Antoine — Cane variety S 17

Water Treatment	*Plant crop (1973)*			*1st ratoon (1974)*		
	TCH	*IRSC*	*TSH*	*TCH*	*IRSC*	*TSH*
1	101.9	12.2	12.42	87.5	12.5	10.93
2	107.6	11.0	11.78	86.3	11.8	10.17
3	90.1	11.9	10.74	91.7	12.2	11.19
S.E.	±6.66	±0.15	±0.73	±9.31	±0.36	±1.00
C.V.%	26.11	4.47	21.61	36.47	5.06	16.07

Table 13. Irrigation trial at Palmyre — Cane Variety M 351/57

Water Treatment	*1st ratoon* (1974)		
	TCH	*IRSC*	*TSH*
1	127.5	10.6	13.72
2	131.8	11.6	15.26
3	129.2	11.0	14.17
S.E.	±5.12	±0.23	±0.57
C.V.%	6.85	3.59	3.90

In plant cane harvested at Tamarin in 1973, treatments 1 and 2 were superior to treatment 3, both cane and sugar yields being greater. However, there were only 2 replicates, as mentioned above. In the other trial at Tamarin treatments 1 and 2 gave significantly better cane yields than treatment 3 but the different levels of nitrogen fertilisation included in this trial had no discernable effect of any kind. (Table 14).

Table 14. Irrigation trials at Tamarin — Cane variety M 13/56

Water Treatment	*Expt. with 2 replications/ treatment Plant crop (1973)*			*Expt. with 3 replications and including 4 N levels Plant crop (1974)*		
	TCH	*IRSC*	*TSH*	*TCH*	*IRSC*	*TSH*
1	146.5	10.4	15.05	137.9	10.7	14.77
2	141.3	10.3	14.62	137.7	10.4	14.24
3	129.2	11.0	14.08	131.8	11.1	14.58
S.E.	±3.65	±0.16	±0.28	±1.47	±0.18	±0.24
C.V.%	18.99	8.36	11.43	3.76	5.63	5.84

It is difficult to draw any conclusion from these results and although the trials are being allowed to continue, it may be desirable to set up others with a layout that permits more critical analysis of the data obtained.

Drip irrigation

The trial with drip irrigation laid down at Palmyre, Médine S.E., to determine the influence of different spacings of cane rows and dripper lines was harvested early in the season at about 8 months of age and will now allow harvest of ratoons early in 1975 at the normal age of about 12 months. The yields obtained for the plant crop will therefore not be considered in the final results.

General

Preliminary work on the calibration of the recently acquired neutron probe (Wallingford Model 225) (Plate II) was carried out and the results obtained have been satisfactory. The probe will be useful in following the moisture status of soil in irrigation experiments on free soils.

Several studies were carried out for various estates on water distribution patterns of sprinklers as well as on soil moisture characteristics.

Survey

A new survey of irrigated cane lands was made and the results are given below :

Area irrigated (ha)

	Surface		*Overhead*		*Total*	
	1970	*1974*	*1970*	*1974*	*1970*	*1974*
Planters	2,089	2,011	672	1,303	2,761	3,314
Estates	5,390	4,792	5,123	6,423	10,513	11 215
Total	7,479	6,803	5,795	7,726	13,274	14,529

Spacing

Four trials were laid down in 1970, at sites where climatic and edaphic conditions are representative of the main cane areas of Mauritius, to study the effect of different spacing of cane rows on yield. Two varieties were used in each experiment, one erect and the other recumbent.

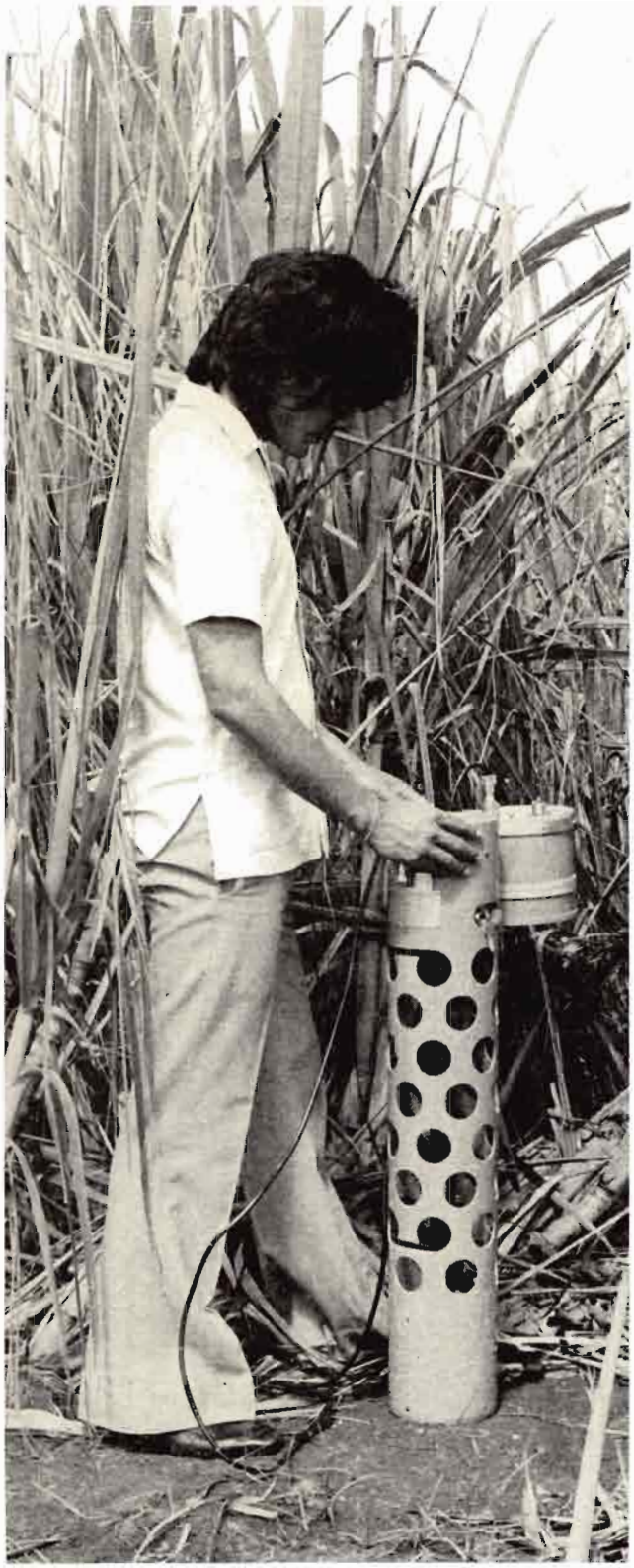
The sites and the varieties used were as follows :

Sites	*Altitude* *m*	*ft*	*Rainfall* *mm*	*in*	*Soil type*	*Irrigation*	*Varieties*
Belle Vue	90	300	1,338	52.7	Latosolic Reddish Prairie	None	M 13/56 & M 377/56
Tamarin	40	140	1,387	54.6	Low Humic Latosol	Overhead	,,
Bénarès	137	450	2,159	85.0	Humic Latosol	None	M 93/48 & N Co 376
Sans Souci	275	910	3,885	153.0	Humic Ferruginous Latosol	None	,,

Treatments were :

1. Regular spacing of 4 feet (1.30 m) between the lines.
2. Alternate spacing of 3 and 5 ft (0.97 & 1.62 m) between the lines.
3. Alternate spacing of 2 and 6 ft (0.65 & 1.95 m) between the lines.
4. Regular spacing of 5 ft (1.62 m) between the lines.
5. Alternate spacing of 4 and 6 ft (1.30 & 1.95 m) between the lines.
6. Alternate spacing of 3 and 7 ft (0.97 & 2.27 m) between the lines.

The plots were 40 feet (13 metres) square, comprising 10 lines of the first three treatments and 8 lines of the last three.



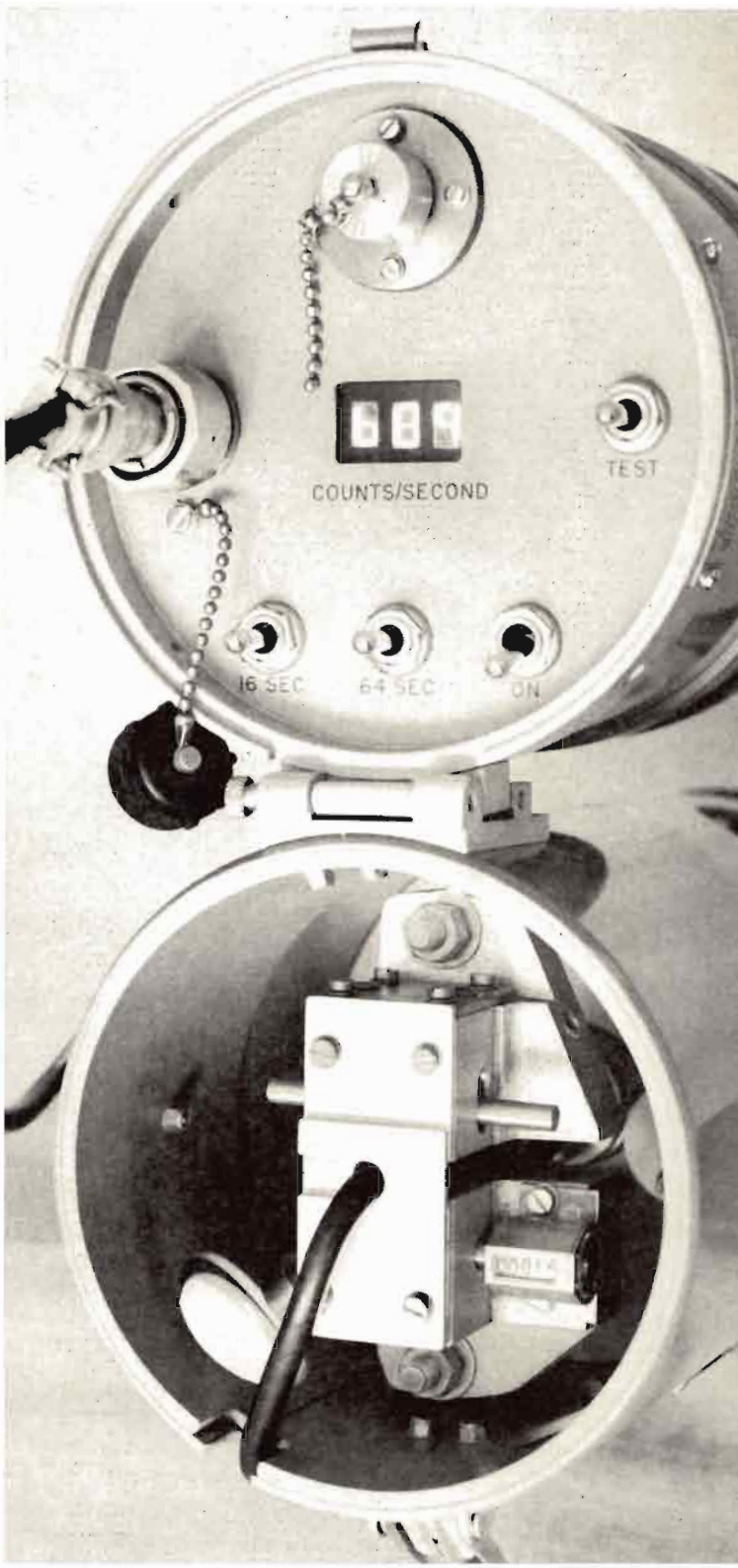


Plate II. The Wallingford Neutron Probe for soil moisture determination and (*right*) close-up of its rate scaler.

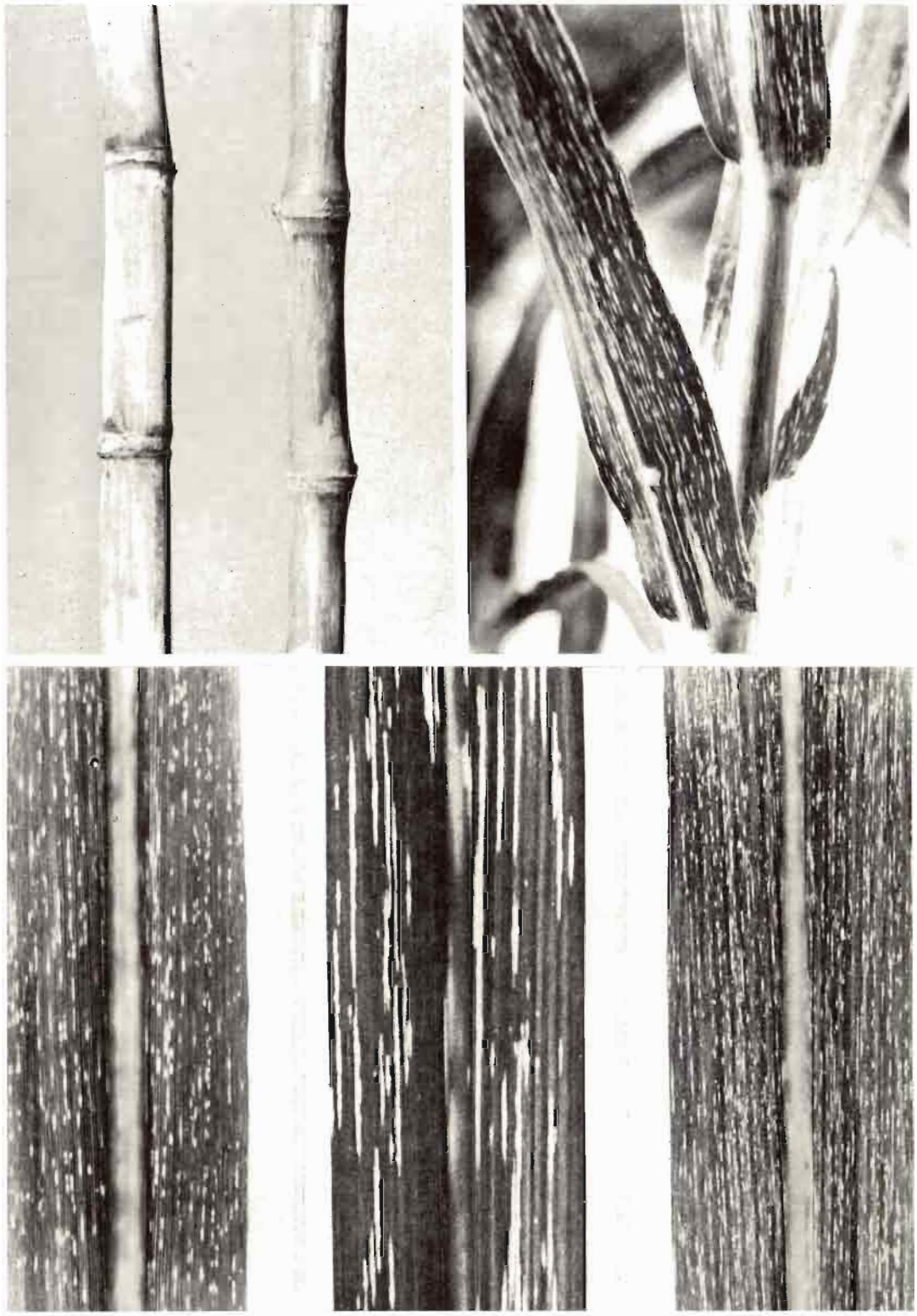


Plate III. Cane streak disease. *Top left*, stalk symptoms, diseased stalk on right. *Top right*, leaf symptoms, showing galled midrib. *Bottom left*, diseased var. R.P.8 in 1925. *Bottom right*, same in 1974. *Bottom middle*, streak from *Coix lacryma-jobi* transmitted to var. R.P.8

The trials were harvested in virgins, 1st and 2nd ratoons and the cumulative results for sugar per hectare are given in Table 15. It was concluded that the different spacing treatments did not affect yields. It may be noted that spacings of 7 feet (2.27 m) alternating with 3 feet (0.97 m) and of 6 feet (1.95 m) alternating with 4 feet (1.30 m) can be of advantage for interplanting of foodcrops provided canes are burnt at harvest to dispose of trash, which could not be accommodated in interrows of 3 or 4 feet wide.

Table 15. Yield of sugar (tonnes/ha) at different row spacings

(Cumulative results for virgins, 1st and 2nd ratoons)

	Belle Vue		*Tamarin*		*Bénarès*		*Sans Souci*	
Treatment	*M 13/56*	*M 377/56*	*M 13/56*	*M 377/56*	*N Co 376*	*M 93/48*	*N Co 376*	*M 93/48*
1	11.1 (4.7)*	11.1 (4.7)*	9.7 (4.1)	10.4 (4.4)	8.3 (3.5)	10.7 (4.5)	8.8 (3.7)	9.0 (3.8)
2	10.0 (4.2)	11.8 (5.0)	9.0 (3.8)	10.7 (4.5)	8.5 (3.6)	10.9 (4.6)	9.5 (4.0)	9.5 (4.0)
3	11.6 (4.9)	11.4 (4.8)	9.5 (4.0)	11.1 (4.7)	7.3 (3.1)	10.2 (4.3)	9.2 (3.9)	8.5 (3.6)
4	11.1 (4.7)	11.6 (4.9)	8.5 (3.6)	10.7 (4.5)	7.8 (3.3)	11.4 (4.8)	9.0 (3.8)	9.0 (3.8)
5	10.9 (4.6)	11.4 (4.8)	9.5 (4.0)	10.9 (4.6)	7.3 (3.1)	10.9 (4.6)	9.0 (3.8)	9.0 (3.8)
6	10.2 (4.3)	10.9 (4.6)	9.0 (3.8)	10.4 (4.4)	7.1 (3.0)	10.9 (4.6)	8.5 (3.6)	9.0 (3.8)
S.E. ±	0.47 (0.20)		0.40 (0.17)		0.38 (0.16)		0.33 (0.14)	

* Figures in brackets give equivalent per arpent.

Physiology of flowering

Preliminary trials were laid down in 1974 in an attempt to find a method of controlling flowering by the use of growth regulators. Gibberellic acid (GA3) and MON 045 (N-N-Bis phosphonomethyl glycine) were sprayed separately at rates of 0, 100, 1,000 and 10,000 ppm on defoliated and undefoliated stalks of *Saccharum spontaneum* var. 51 NG 2 at three stages of development, viz. induction (Feb. 6), early differentiation (Feb. 25) and late differentiation (March 14).

The results indicated that MON 045 at 10,000 ppm reduces stalk elongation and leaf emergence significantly when applied at any of the three stages of development. At this rate it suppressed flowering completely when applied at induction and partially suppressed it when applied at the two other stages.

On the other hand, in all plots, GA3 gave only a slight increase in rate of leaf emergence and stalk elongation and did not affect either the intensity of flowering or the time of emergence. Further trials are to be laid down to assess the effect of the two chemicals applied together on the same plant.

Maturity trials

Maturity trials 1971

At the end of a cropping cycle, canes are either harvested in July/August and uprooted immediately for replanting to a short season plant crop or harvested later, the land then remaining fallow for planting comparatively early in the following year to a long season plant crop. It is therefore of interest for the industry to assess the effect of harvesting, in the final year of a crop cycle, young canes (less than 52 weeks old) in July and older canes (60 to 68 weeks old) in October/November.

The 1971 maturity trials (*vide* Ann. Rep. 1973, page 34) included plots of varieties M 13/56, M 351/57, S 17, M 377/56, M 442/51 and M 93/48 each harvested in 1st ratoons at 52 weeks in July, September and November 1973. These were used to obtain in 1974 the treatments shown in Fig. 7.

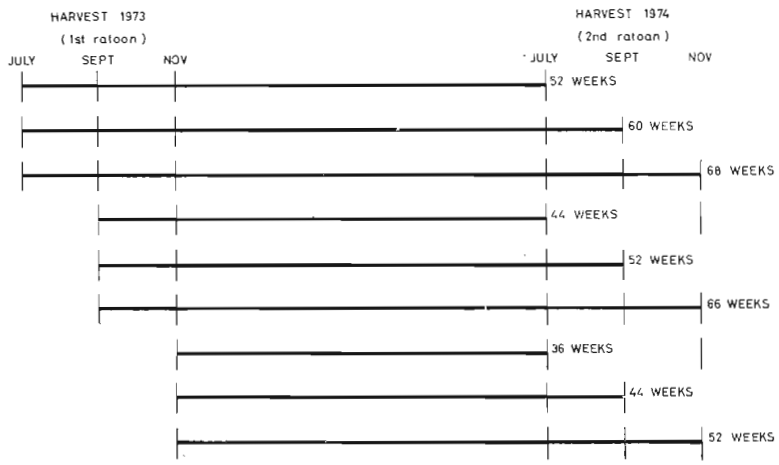


Fig. 7. Harvest schedule and age of crop in maturity trials.

The results obtained were as follows :

The effect of delaying harvest :

In varieties M 13/56, M 351/57 and S 17 grown in the super-humid and irrigated zones no significant gain in sugar yield occurred from July to November, while yield of varieties M 377/56, M 93/48 and M 442/51 significantly increased in the humid and super-humid zones for the same period. In the sub-humid zone the six varieties gave maximum sugar yield in September. In the humid zone varieties M 13/56, M 351/57 and S 17 gave low sugar yields in November (Table 16).

IRSC showed a trend to increase from July to November in all varieties and in all environments. The reduction in sugar yields observed above was thus due to the fresh weight yield component. The decrease of that component observed in the drier zones may be due to desiccation.

The effect of advancing harvest :

The general trend was a reduction in sugar yield when canes were harvested at the age of 36 weeks in July, this being more marked in certain varieties and zones. These observed reductions in sugar yield were due to lower IRSC and fresh weight yields, IRSC being lower because of age as well as time of harvest while lower fresh weight was mainly due to age. In the sub-humid zone higher sugar yields were recorded in canes of 44 weeks in September than in canes of 52 weeks in November (Table 17).

Table 16. Effect of delaying harvest on sugar yield (tonne/ha) of varieties M 13/56, M 351/57 and S 17 grown in two environments

	Labourdonnais (Sub-humid)			*Grande Rosalie* (Humid)		
	Altitude : 73 m Rainfall : 1300 mm Soil type : P2			Altitude : 198 m Rainfall : 2200 mm Soil type : H1		
	July 52 *weeks*	*September* 60 *weeks*	*November* 68 *weeks*	*July* 52 *weeks*	*September* 60 *weeks*	*November* 68 *weeks*
M 13/56	10.3	11.3	5.8***	11.3	12.7	7.7**
M 351/57	7.4	10.7	8.7	10.9	11.8	8.6*
S 17	10.2	11.2	9.1	14.8	13.8	10.0**

* Significantly lower than July at P = 0.05
** Significantly lower than July at P = 0.01
*** Significantly lower than July at P = 0.001

Table 17. Effect of advancing harvest on sugar yield (tonne/ha) of varieties M 13/56, M 351/57 and S 17 grown in two environments

	Labourdonnais (Sub-humid)			*Grande Rosalie* (Humid)		
	Altitude : 73 m Rainfall : 1300 mm Soil type : P2			Altitude : 198 m Rainfall : 2200 mm Soil type : H1		
	July 36 *weeks*	*September* 44 *weeks*	*November* 52 *weeks*	*July* 36 *weeks*	*September* 44 *weeks*	*November* 52 *weeks*
M 13/56	7.3***	12.5	9.2*	7.1	8.9	6.6
M 351/57	6.6***	12.9	9.2**	7.3	9.7	8.8
S 17	8.7*	11.9	9.4*	9.0	8.7	6.5

* Significantly lower than September at P = 0.05
** Significantly lower than September at P = 0.01
*** Significantly lower than September at P = 0.001

The general trend shows that July harvest may be delayed to November without loss of sugar except in the sub-humid zone. On the other hand, some losses may be entailed by bringing forward November and September harvests to July. These results will be useful in establishing the yield balance sheet to compare short and long season crops.

The effect of normal harvest (age 52 weeks) :

In all zones, highly significant increases in sugar yield occurred from July to September and from July to November in varieties M 93/48, M 442/51, M 377/56. Differences between September and November harvests were not significant except in the sub-humid zone where November harvest was lower than September and similar to July. These trends were similar for all varieties. M 377/56 was the superior variety irrespective of time of harvest in the humid and super-humid zones, while in the sub-humid zone the three varieties gave similar yields.

In the super-humid zone, sugar yields from July to November were generally stable in varieties M 13/56 and S 17, while there was an increase in yield in variety M 351/57 for the same period. On the other hand, in the humid zone, yields of all varieties decreased from July to November, this being most pronounced in variety S 17 and least in M 351/57. Yields of sugar were maximal in September for all varieties when grown in the sub-humid zone.

Maturity trials 1972

It will be recalled that these trials were laid down to investigate the effect of time of harvest on varieties M 124/59, M 438/59, M 496/59, M 31/45, M 377/56 and S 17 grown in seven contrasting environments. Results in first ratoon will be considered here, those in virgin cane having been presented in the Annual Report for 1973. Plots were harvested sequentially at a constant age of 52 weeks on the following dates : July 8, August 19, October 1 and November 25.

The two components of variance, variety and time of harvest, were generally significant for IRSC, fresh weight and sugar yield. The variety × time of harvest interaction for any particular locality was generally slight and the response of the six varieties was therefore similar. Three types

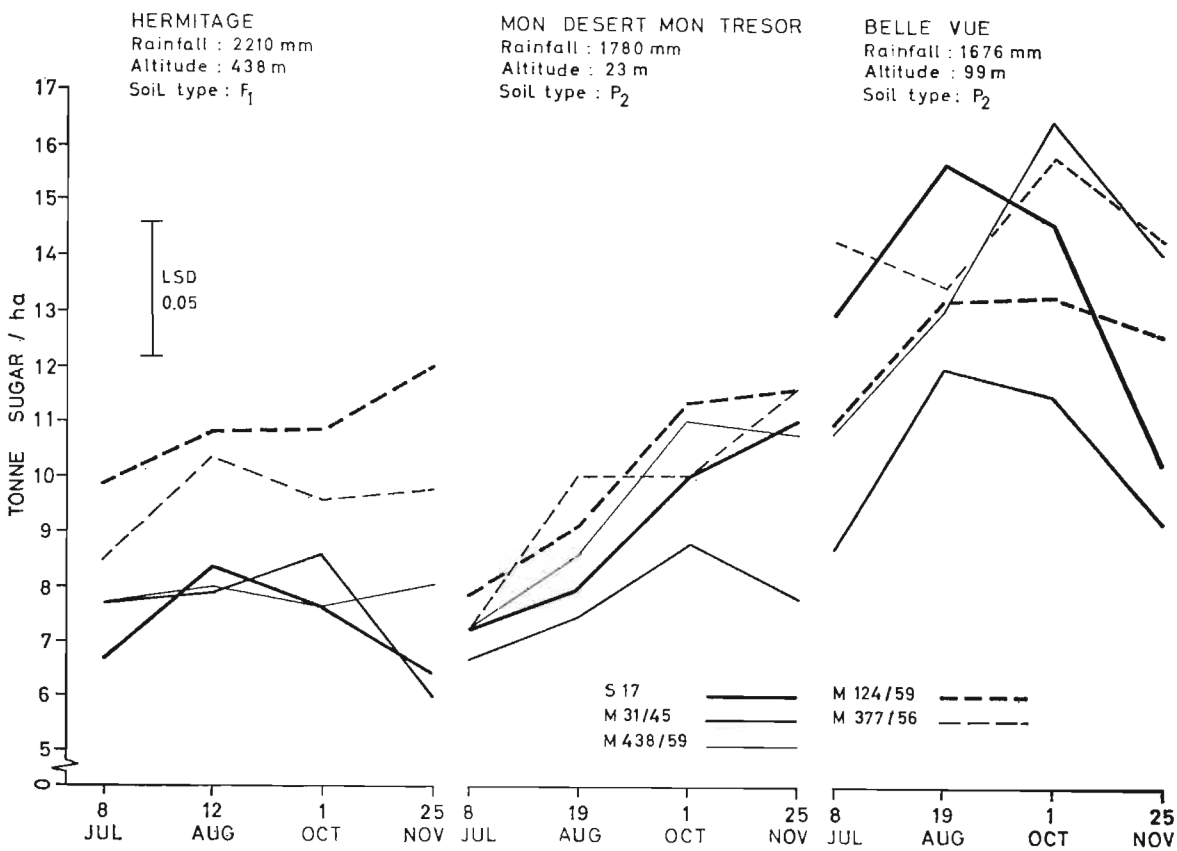


Fig. 8. Effect of date of harvest on 1st ratoon sugar yields of varieties M 31/45, M 377/56, M 124/59, M 438/59 and S 17 grown in three environments.

of response were noted in the various environments (Fig. 8) and are defined below :

1. Declining fresh weight yield from July to November compensated by increasing IRSC, resulting in stable yields throughout the season (Hermitage and FUEL).
2. Stable or slightly increasing fresh weight yields from July to November with increasing IRSC, resulting in higher sugar yields the later the time of harvest (Rose Belle, Mon Désert-Mon Trésor and Ferney).
3. Stable fresh weight yields in July, August and October with a sharp decline in November and low IRSC in July, resulting in maximum sugar yields in August and October (Belle Vue and Beau Plan).

The performance of the varieties for the first ratoon crop has been assessed on sugar yields. The varieties that gave the highest sugar yields for each date of harvest and environment are shown in Table 18.

Table 18. Performance of varieties M 31/45, M 377/56, M 124/59, M 438/59, M 496/59 and S 17 for the first ratoon crop showing those giving the highest sugar yield in different environments and at different harvest dates

	Locality	*Hermitage*	*Rose Belle*	*F.U.E.L.*	*Ferney*	*M. Desert-M. Tresor*	*Beau Plan*	*Belle Vue*
Date of Harvest	*Rainfall (mm)*	2210	3100	2362	2286	1780	1600	1676
	Altitude(m)	438	219	146	15	23	91	99
	Soil type	F 1	B 1	L 4	H 2	P 2	P 2	P 2
July 8		M 124/59	M 124/59 M 377/56	S 17	All var.	M 124/59	S 17 M 377/56 M 438/59	M 377/56 M 496/59
August 9		M 124/59 M 377/56	M 377/56	M 31/45 S 17 M 377/56	All var.	All var.	M 377/56	S 17
October 1		M 124/59	M 124/59 M 438/59	M 31/45 S 17	M 31/45	M 377/56	M 496/59 M 377/56	M 377/56 M 438/59
November 25		M 124/59	M 31/45 M 124/59	M 377/56 M 31/45	M 31/45	M 377/56	M 377/56	M 377/56 M 438/59

It is not proposed at this stage to cumulate the results of virgin and first ratoon crops, as the former will account for only 15% to 20% of the total yield of a seven year crop cycle. However, the performance of the various varieties in virgin and first ratoon will be contrasted for each environment. The marked superiority of M 124/59 in the virgin crop at Hermitage at all dates of harvest was again evident in the first ratoon crop. At Rose Belle, M 31/45, which had performed well from August to November in virgin, was outstanding only in November during first ratoon. Performance of varieties for virgin and first ratoon was similar from July to October at FUEL, except for the better performance of M 31/45 in ratoon, which was also evident for the November harvest. M 438/59 at Ferney, which had performed well in virgin, was average in ratoon while M 31/45 was good late in the season in ratoon in the same locality. The performance of virgin and first ratoon crops at Mon Désert-Mon Trésor and Beau Plan was similar. At Belle Vue, the best variety for late harvest in virgin was M 124/59 and in first ratoon M 377/56.

Sugar cane ripeners

Azulam

The candidate ripener "Azulam" was applied on canes of variety M 438/59 in September to determine if it could maintain or increase the sucrose content when harvest is late (December). The dosage rates used were 0, 3 and 6 kg a.i./ha and the plots were harvested 4, 8 and 12 weeks after application.

Although a significant increase in IRSC was observed 12 weeks after application at the rate of 6 kg/ha, no significant effect on sugar yield was detected. The chemical had growth promoting properties, increasing rate of elongation and leaf emergence, particularly at 12 weeks after application (Figs. 9 & 10). These preliminary results indicate that this chemical may have both growth promoting and ripening properties. Further trials are to be laid down to confirm these results.

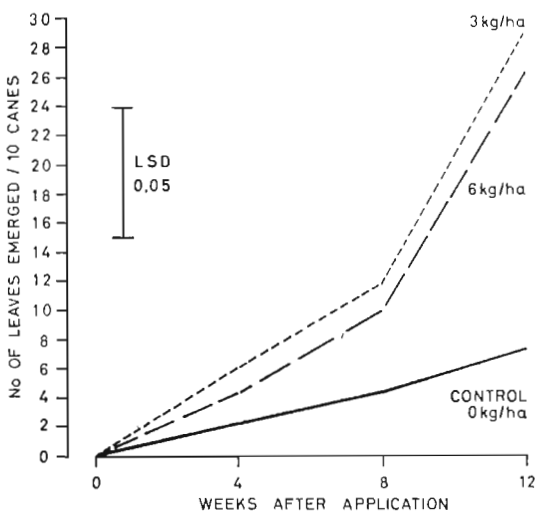


Fig. 9. Effect of Azulam applied at 3 and 6 kg/ha on leaf emergence of variety M 438/59.

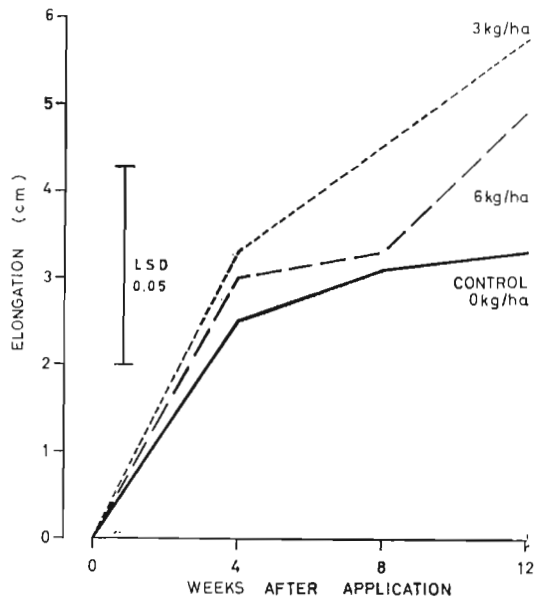


Fig. 10 Effect of Azulam applied at 3 and 6 kg/ha on elongation of var. M 438/59.

Mon 045

The ripening properties of this chemical have been well established in experimental plots (see previous Annual Reports). It was therefore decided to investigate its effect on ratooning ability, as this is one of the important factors to consider if the chemical is to be released for industrial use.

Two trials, one on each of the varieties S 17 and M 13/56, were laid down to compare ratooning ability of canes sprayed in 1974 with 4 kg/ha of Mon 045 and harvested at 3, 6 and 9 weeks after application. In these experiments the same treatments will be applied in successive years to evaluate cumulative effects.

DISEASES

Disease situation and control

The incidence of major diseases, particularly gumming disease and leaf scald, in cane plantations in 1974 was the lowest for the past decade. Only a few fields of the variety M 377/56 were found infected with gumming disease and the levels of infection were moderate. Chlorotic streak symptoms, usually common in super-humid areas, were infrequent. Owing to dry conditions at the beginning of the year, yellow spot infection started unusually late, in April, and subsided at the beginning of July. On the other hand, minor diseases such as rust and brown spot were more widespread and severe than usual.

Ratoon stunting disease

Two hundred and thirty-five tonnes of cuttings were treated against RSD with the long hot water treatment at the Institute and 100 tonnes were treated on sugar estates to establish a total of 28 hectares of A nurseries on estates and 2 hectares at the Central Nursery. A total of 245 hectares of B nurseries were established in all. Twenty-five percent of total plantations on estates were established with planting material originating directly from RSD-free nurseries.

Disease resistance testing

Gumming

Infection in inoculated rows and susceptible controls in all gumming trials was unusually low confirming that, despite inoculation, it is difficult to maintain high disease intensity in such trials when conditions for natural spread are adverse. The results of the trials are summarised in Table 19.

Table 19. Results of gumming resistance trails in 1974

Resistance testing stage	*Stage of varieties in selection programme*	*No. of varieties tested*	*% discarded due to susceptibility*	*% with intermediate reaction*	*% promoted in selection programme*		
					Resistant		*Reaction undetermined**
I	Propagation plot**	2298	<0.1	1.7	83.5	+	14.8
II	1st Selection Trial**	115	0.9	13.0	86.1		
III	1st Multiplication***	28	7.1	35.7	57.1		

* Dead or poor growth
** One trial
*** Three trials in different localities

Attempts to improve the method of testing resistance by inoculation of excised leaves have not led to expected results. The precision obtained does not justify the laborious and painstaking procedure involved, so long as the disease is present in plantations.

Leaf scald

Satisfactory results were obtained in the leaf scald trial laid down in 1972 after inoculation in first ratoon. Seven varieties proved susceptible to highly susceptible, of which three were slightly less and four more susceptible than the control M 202/46, eight proved resistant to moderately resistant and five showed an intermediate reaction.

Smut

In the smut observation plot, established in a dry locality, nine out of 31 varieties in first ratoon showed susceptibility as opposed to only two when they were in plant cane. Of 28 varieties in plant cane only one has been found susceptible.

Yellow spot

Infection was very low in the yellow spot observation plot in the super-humid zone, the most susceptible control showing only 15% leaf spotting. Twenty varieties appeared resistant and eight showed an intermediate reaction.

Disease reaction of new varieties

The reactions to major diseases of varieties B 51129 and M 356/53, which have now been approved for commercial plantings, are given in Table 20. In addition, M 356/53 has proved susceptible to the "root disease complex" and slightly susceptible to eyespot while B 51129 is susceptible to the "wilt complex".

The variety M 738/59, now in pre-release multiplication, has proved too susceptible to smut to be considered for release.

Table 20. Reaction of varieties B 51129 and M 356/53 to some major diseases in Mauritius

	Chlorotic streak	*Gumming*	*Leaf scald*	*Smut*	*Yellow spot*
M 356/53	S*(7)**	MR (4)	SS (5)	R (2/3)	SS (5)
B 51129	SS (5)	SS (5)	R (2/3)	—	SS (5)

* R = Resistant
S = Susceptible
MR = Moderately resistant
SS = Slightly susceptible

** ISSCT disease rating system.

Specific investigations

Chlorotic streak and ratoon stunting diseases

Three field trials, as well as greenhouse tests using one-eyed cuttings, are being conducted to determine the effect of the long and short hot water treatments on cane growth and to elucidate the relative importance of chlorotic streak and ratoon stunting diseases as well as the combined effect of both diseases. So far no difference attributable to the different treatment of planting material has been observed.

Gumming

Attempts to develop a treatment for eliminating the gumming disease pathogen from cane cuttings were pursued. Investigations on cane tissues with systemic infection showed that although hot water treatment reduced considerably the number of viable bacteria, complete elimination could not be achieved even by such a drastic treatment as 58°C for 1 hour. The importance of the low number of bacteria surviving in infected cuttings after heat treatment, as a source of inoculum in a new plantation, has yet to be assessed.

Tests with treatment combinations involving hot water and penicillin indicated that the latter did not appreciably improve the curative effect of heat treatment.

Pineapple disease (Ceratocystis paradoxa)

Further investigations were carried out on the use of Benomyl (Benlate) for treatment of cane setts against pineapple disease. Settling of fungicide particles was found to be negligible when treating setts with a cold dip in 135-litre containers according to current practice. Use of the fungicide for such treatment has been recommended at the rate of 200 g/320 litre/hectare (84 g/30 gallons/arpent). The addition of an indicator dye such as Rhodamine at the rate of 5 g/100 litres is also recommended.

Table 21. Details of running tests carried out for treatment of cane setts in hot Benlate suspensions at 52°C/20 minutes

	Tank capacity (X 1000 l)	*No. of baskets treated*	*Weight treated (tons)*	*Area planted (ha)*	*Wt. of fungicide (kg)*		
					Initial	*Total*	*Per ha*
Bel Ombre	15.8	70	190	20	5	10.5	0.53
Mon Désert-Alma	23.7	190	760	76	8	18	0.23
Highlands	22.5	62	200	25	7	13	0.52
Réduit Exp. Station	5	74	37	4.4	1.5	15	0.34

Running tests were carried out in three commercial tanks with the fungicide added to water for treatment of setts at 52°C/20 minutes. Details of the tests as well as those carried out in the Institute's tank are given in Table 21 and variations of fungicide concentration in three of the tanks as determined by spectrophotometric analysis are presented in Fig. 11. Such treatment has been found to be efficient and economical when starting with an initial concentration of 30 g/100 litres and topping up daily with an adequate amount of fungicide to make up for settling, provided the circulation in the tank is good. Fungicide concentration should preferably be maintained above 15 g/100 litre throughout.

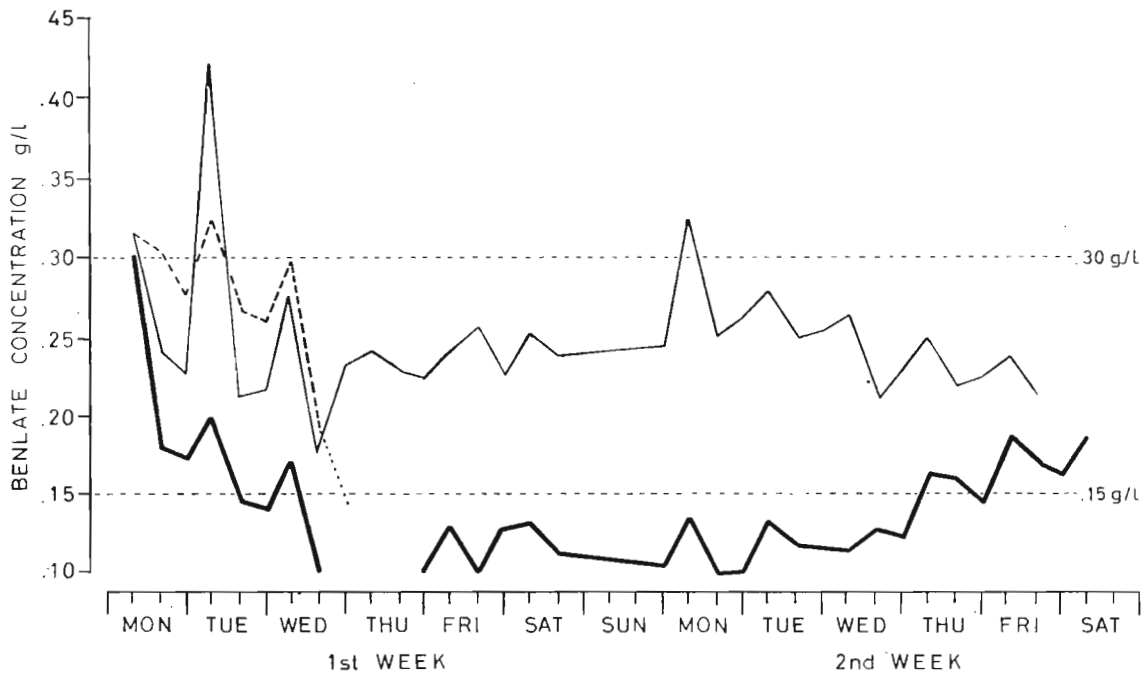


Fig. 11. Fluctuations in effective Benlate concentration in hot suspensions in three commercial tanks after continued treatment of cane setts at 52°C/20 min. Thin line, Bel Ombre S. E.; dotted line, Mon Désert Alma S.E.; bold line, Highlands S.E.

Streak

Cane streak disease, eradicated in 1971 from a plot of var. H 53-263 that had been found infected at Medine, was again observed on a stool of that variety in the cane varietal collection at Réduit.

Transmission studies were undertaken under insect proof conditions with the vector *Cicadulina mbila* and the disease has been successfully transmitted to varieties H 53-263, H 44-3098, M 112/34 and RP 8.

A search for grass hosts that could harbour the pathogen in nature and vector transmission studies have revealed three distinct strains of the virus.

1. The sugar cane strain, which was obtained from H 53-263 and causes fine short streaks in all varieties infected. It is most probably the strain originally found in Mauritius in 1928 on variety RP 8. Although symptoms are similar to those described on cane in South and East Africa, unsuccessful attempts to transmit the disease to Uba and other varieties well-known for their susceptibility in those countries leave doubt as to whether the strain is identical to the African strain of cane streak.
2. The *Coix* strain, which is obtained from the naturally infected grass *Coix lacryma-jobi.* This strain is more readily transmissible to cane than the sugar cane strain and causes severe and permanent infection in the susceptible cane varieties mentioned above while producing broader and longer streaks. Such symptoms have never been found on naturally infected cane in Mauritius but they are similar to those reported on naturally infected H 44-3098 in Réunion. This strain can infect maize as well.
3. The maize strain, which is transmissible to *Coix* and to sugar cane but in the latter produces only mild and often evanescent symptoms.

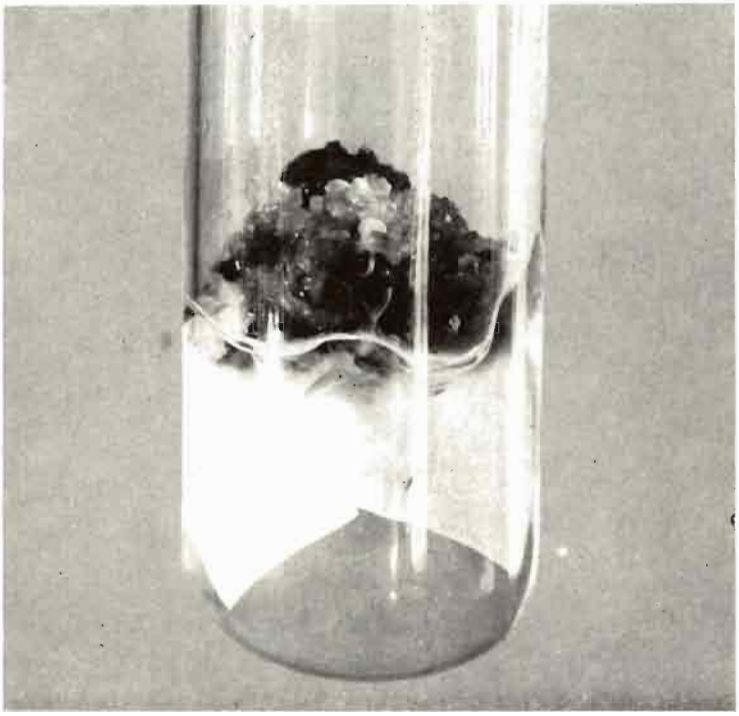
Further work, involving electron microscopy at Exeter University and serological studies, is proceeding to differentiate between the strains and to elucidate their relationship with those in other countries.

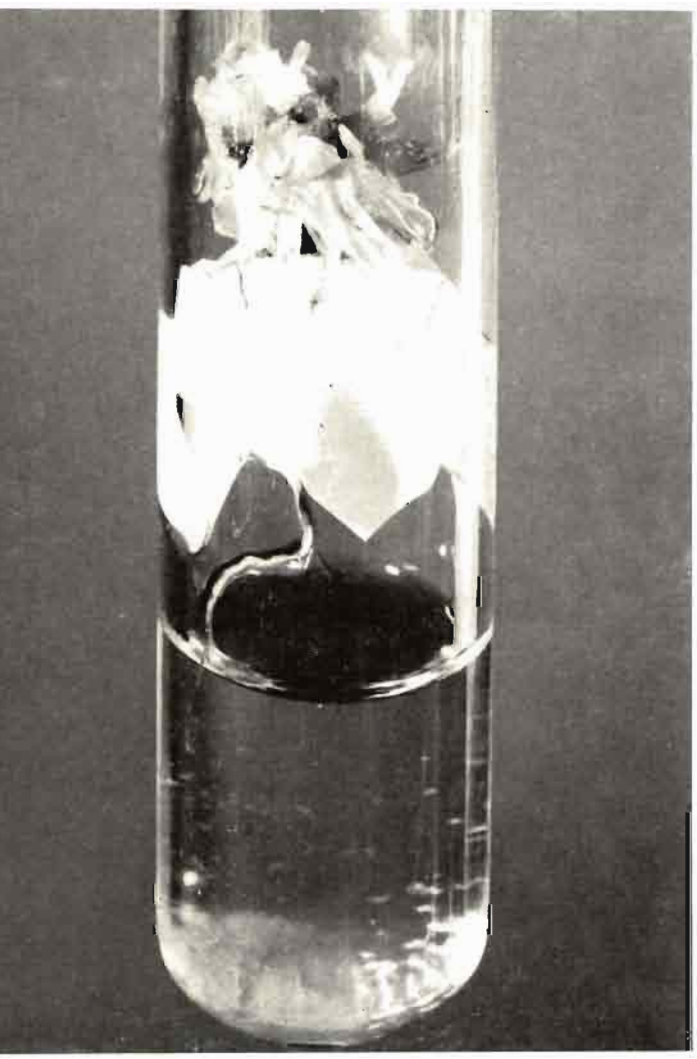
Effect of Dithane M 45 on cane growth

Cane fields intercropped with potatoes have on occasion been observed to ratoon poorly in super-humid areas. As potatoes have not been found to affect cane growth through direct competition it was thought that pesticides applied to them might be responsible. Reports from elsewhere have claimed that Dithane M 45 sprays have a deleterious effect on cane growth and an experiment was laid down in the super-humid zone, where heavy sprayings of the fungicide are essential to control potato blight, to study the effect on cane growth of intercropping with potato receiving different dosages of Dithane M 45. Soil microbiological investigations have so far revealed no differences between the different plots in counts of total and fungal microflora or nitrification potential. Yields and data on ratooning are not yet available.

Tissue culture

Cane tissue culture was initiated. Successful attempts were made with variety M 377/56 using intercalary meristem on liquid culture media (Plate IV).





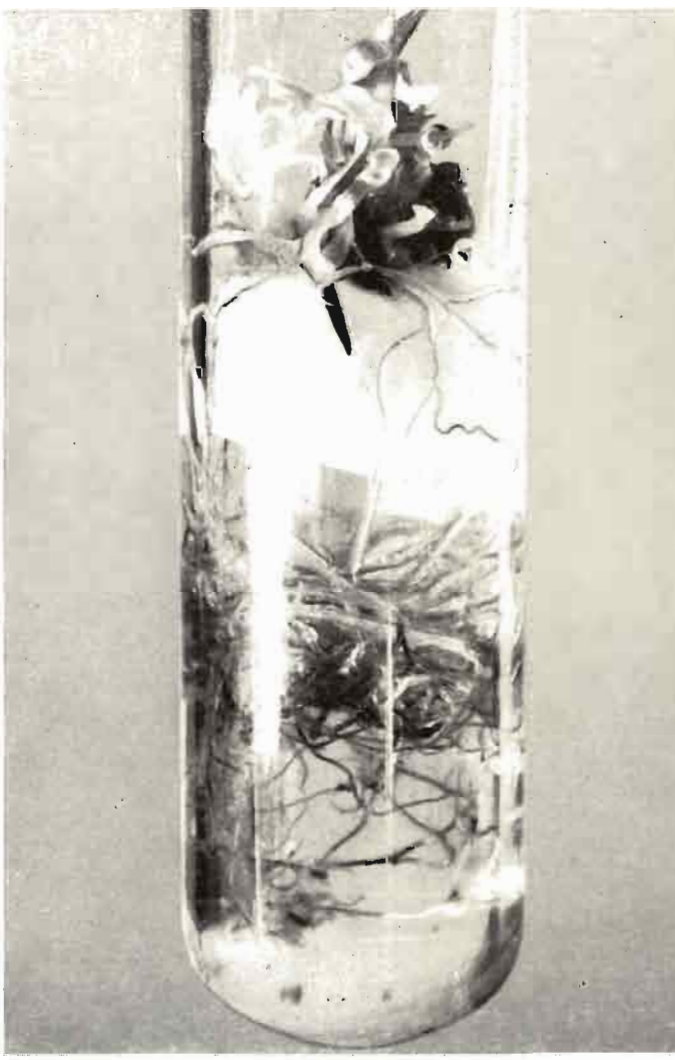


Plate V. Weed control in a logarithmic trial showing plots treated with Herbotan (*top*) and Velpar (*bottom*) compared with untreated plot (*middle*)

PESTS

Biological control of the scale insect (*Aulacaspis tegalensis*)

The breeding and release of the *Aphytis* sp. obtained from Queensland in 1972 was discontinued in June after the release of about 210,000 adults in the preceding months. The total number of this parasite released since its importation was thus brought to about 383,000.

Table 22 summarises the importation of Hymenopterous (Aphelinid) parasites made during recent years to further the biocontrol of scale insect. It will be seen that five species have been imported and reared locally in very large numbers for multiple releases in different localities at different times of the year. It is considered that all have been adequately tested and those that fail to become established may be dismissed from further consideration and deemed unsuitable to local conditions. Samples of scale insect collected in the field have to date revealed the establishment of *Physcus P. seminotus* (*Vide* Ann. Rep. 1973). Studies are currently being made to assess the dispersion and importance of *P. seminotus* and to determine if any of the other introduced parasites have also become established.

Enquiries were made as to the feasibility of obtaining an *Aphytis* sp. known to parasitise *Aulacaspis* spp. on sugar cane in Indonesia.

Table 22. Parasitic Hymenoptera introduced to date against the sugar cane scale insect (*Aulacaspis tegalensis*)

Species	*Origin/date*	*Period of releases*	*Approx. no. released*
Physcus seminotus Silv.*	Uganda, May '69	Oct. '69 — Oct. '71	100,000(?)
Physcus subflavus Ann. & Ins.*	Tanzania, Nov. '70	Jan. '71 — Ap. '72	100,000(?)
Metaphycus sp.*	Tanzania, March '72	May '72 — May '73	150,000
Physcus sp. nr. *nigriclavus* Gir.**	Queensland, Sept. '72	Jan. '73 — June '73	110,000
Aphytis sp.**	Queensland, Sept. '72	Oct. '72 — June '74	383,000

* Host in country of origin — *A. tegalensis*
** Host in country of origin — *A. madiunensis*

The stem borer (*Chilo sacchariphagus*)

Insecticide experiment

An experiment was made to assess the efficacy of fensulfothion against the stem borer when applied to the soil in granular form (as 5% "Terracur P"). The object was to determine if the systemic action of the insecticide, applied before the grand period of growth, could confer protection against attack for the remainder of the crop period. A randomised block layout was adopted, with 5 replications, a plot size of 4 rows by 13 m and treatments of 0, 2 and 10 kg/ha a.i. insecticide applied in a band along the rows. Application was made in mid-January to unattacked 7 month-old plant canes. Results assessed in July as % canes and % internodes bored, and as weight of cane, showed no significant differences between treatments at the 5% level. Average infestation amounted to 68% canes and 3.7% internodes bored.

Estimation of damage to millable canes

Data on borer damage shown by millable canes at harvest were obtained from 55 fields with the object of devising a standard, practical method of field sampling that would give damage estimates with acceptable confidence intervals. The difficulties encountered were greater than anticipated and the data acquired proved inadequate. Further studies are to be made.

Population dynamics

Investigations on the fluctuation of stem borer populations were continued. To date, most data has been obtained from fields in the northern plain and the information gained indicates a fairly consistent pattern of crop infestation. Fields in other climatic areas were selected during the year to extend these studies.

Sex pheromones

Enquiries were made into the possibility of initiating work on the sex pheromones of *C. sacchariphagus* with a view to the use of synthetic pheromones for field studies of the insect and for its control. The Tropical Products Institute, London, kindly agreed to co-operate by conducting the necessary chemical investigations using material sent from Mauritius.

The white borer (*Argyroploce schistaceana*)

A study of early-shoot loss by white borer in an upland plant crop was completed. The data illustrated the considerable tolerance of plant cane to loss of young shoots and tends to support general observations that white borer does not materially affect plant cane even when fairly numerous. In early ratoon cane, its attack may be of more significance.

General

The future of biological control work against cane pests was discussed in July with Dr. Simmonds, Director of the Commonwealth Institute of Biological Control. The pests considered included scale insect (*Aulacaspis tegalensis*), stem borer (*Chilo sacchariphagus*), white borer (*Argyroploce schistaceana*), thrips (*Fulmekiola serrata*), yellow wasp (*Polistes hebraeus*) and nut grass (*Cyperus rotundus*).

WEEDS

Screening of new herbicides

Logarithmic trial

Using the Chesterford logarithmic spraying machine, three new herbicides, Velpar, Cobex and Herbotan, were compared to DCMU in the super-humid zone (> 2500 mm of rain annually) at Belle Rive Experiment Station. The range of dosage rates was 5.38 — 1.34 kg a.i. / hectare.

Velpar and Herbotan showed exceptionally good herbicidal properties (Plate V), although the former was slightly superior. Both, even at the lowest rate, were better than DCMU at the highest rate. An interesting feature was that Velpar completely controlled one generation of *Cyperus rotundus*, although it only slightly checked the growth of the second generation. Cobex is also a promising herbicide, and, as its use is recommended in many vegetable crops, this chemical is being tested mainly in these crops.

The duration of the experiment was 15 weeks and the total rainfall recorded was 675 mm. A summary of the weed assessment is given in Table 23.

Table 23. Weed assessment data 106 days after spraying

(Frequency abundance method expressed as % of control)

	Dosage rates of herbicides (kg a.i./ha)				
	*5.38 - 4.09 (5.00 - 3.80)**	*4.09 - 3.06 (3.80 - 2.85)*	*3.06 - 2.31 (2.85 - 2.15)*	*2.31 - 1.77 (2.15 - 1.65)*	*1.77 - 1.34 (1.65 - 1.25)*
DCMU	26.3	28.3	36.7	36.3	40.0
Velpar	13.2	13.0	14.2	16.5	20.8
Herbotan	12.9	17.1	18.3	19.8	22.5
Cobex	36.0	35.4	41.3	39.8	40.4

* Figures in brackets represent lb a.i. per arpent.

Cane growth (variety M 93/48) was reduced by both Velpar and Herbotan at dosage rates higher than 2 kg a.i./ha. However, the two products have given good results at lower dosage rates that can probably be tolerated by the sugar cane plant.

Pre-emergence, small-plot trials

Five trials were conducted, three in the super-humid and two in the humid zone.

In two of these trials, DPX 2851 and HP 412, both at 3.23 and 4.30 kg a.i./ha were compared to Atrazine at 4.30 kg a.i. in the humid zone, and to DCMU at the same rate in the super-humid zone.

In the humid zone, DPX 2851 at both rates proved to be better than Atrazine whereas HP 412 was slightly inferior. DPX 2851 was also more effective than DCMU in the super-humid zone, whilst HP 412 was definitely inferior. The two new products did not adversely affect germination or growth of cane. Table 24 shows the results obtained in the two trials.

Table 24. Pre-emergence trials in plant canes

(Frequency abundance as % of control)

Herbicides	*Dosage* (kg a.i./ha)	*Gros Bois* (Humid zone)	*Union Park* (Super-humid zone)
Atrazine	4.30	29.8	—
DCMU	4.30	—	24.2
DPX 2851	3.23	24.2	16.6
DPX 2851	4.30	18.0	14.4
HP 412	3.23	33.7	41.4
HP 412	4.30	32.6	39.5

In the three other trials, the following herbicidal treatments were compared to DCMU at 4.30 kg a.i./ha : Velpar at 0.27, 0.54, 1.08 and 2.15 kg a.i., Herbotan at 2.15 and 4.30 kg a.i. However, the effect on weeds is available for only one trial, conducted at Rose Belle; the two others laid down at Riche-Bois and Valetta were completely weed-free. The effect on cane, nevertheless, was determined.

Velpar and Herbotan, at all dosage rates proved superior to DCMU but cane growth (variety M 31/45) was affected by the 2.15 kg rate of Velpar and the 4.30 kg rate of Herbotan.

In the two weed-free experiments cane growth was again reduced, but more severely, by Velpar at rates of 0.5 kg and higher, and by Herbotan at both rates. The cane varieties were M 13/56 and M 124/59. Table 25 gives a summary of the results obtained.

Table 25. Weed assessment and cane measurements as % of control

Herbicides	*Dosage* (kg. a.i./ha)	*Weed frequency in % of control*	*Cane measurements as % of control*		
		Rose Belle	*Rose Belle*	*Riche Bois*	*Valetta*
DCMU	4.30	42.9	369	—	117
Velpar	0.27	36.8	369	99	99
Velpar	0.54	28.1	339	90	72
Velpar	1.08	26.1	374	70	51
Velpar	2.15	14.2	300	37	32
Herbotan	2.15	36.2	323	92	97
Herbotan	4.30	27.8	266	—	54
Atrazine	4.30	—	—	98	—

Special weed problems

Paspalidium geminatum (Herbe sifflette)

Large scale trials on this troublesome grass have confirmed that Roundup at 3.2 and 4 kg a.i./ha. gives nearly 100% control (Plate VI).

Table 26. Effect of two herbicidal applications on *Colocasia antiquorum*

Herbicides	*Dosage (kg a.e./ha)*	*% kill*
MCPA	2.0	40
Actril-D	1.5	70
Roundup	1.0	98
Roundup	2.0	97
Roundup	3.0	98
Tordon 101	2.0	72
Tordon 101	3.0	75
Tordon 101 + Actril-D	2.0 + 1.5	68
Tordon 101 + Actril-D	3.0 + 1.5	70

Colocasia antiquorum (*Songe*)

This weed is a problem in certain parts of the super-humid zone. The efficacy of several herbicidal treatments was compared in post-emergence of the weed. The treatments were : Roundup at 1, 2 and 3 kg a.e., Actril-D at 1.5 kg a.e., MCPA at 2 kg a.e., Tordon 101 at 2 and 3 kg a.e. alone and in mixture with 1.5 kg a.e. of Actril-D per hectare. The outstanding qualities of Roundup were again evident. Independently of dosage rate, two applications of Roundup gave nearly complete eradication of *Colocasia*. Table 26 gives a comparative account of the weed control obtained with the different treatments.

Apart from Roundup, which is not yet available on the market, an acceptable method of control is to apply Actril-D in post-emergence as often as necessary.

Plate VI. Effect of Roundup on weeds such as *Paspalidium geminatum*, *Coix lacryma-jobi* and *Leersia hexandra* growing in wet conditions. *Top*, before spraying. *Bottom*, 4 weeks after spraying.

Plate VII. Boulders encountered in cane fields and their removal after being shattered.

FIELD MECHANIZATION

Harvesting operations

In 1974, a few more mechanical loaders were introduced into the island. Demonstrations of the TOFT HL 300, ATLAS 1302C and POCLAIN TY2P cane loaders were held. These loaders appear to be of interest in areas where current practice is to preserve water-shoots at harvest, for they can pick up in one pass some 12 rows of cane, thus minimising damage to the water shoots.

The SIMSON, FUNKEY BELL (3 units), TOFT HL 300 and ATLAS loaders were in operation, mostly in the latter half of the harvest season. Teething troubles were experienced with most of them. At two factories, stones entered the mill causing stoppages and damage. Rates of mechanical loading increased as operators acquired experience but were still below expectation, especially on one estate. With the introduction of mechanical loading, it was hoped that the output per day of labourers in cutting only would be fairly high. However, it was observed that this was not so, mainly due to the fact that, in general, labourers would cut just enough to earn more or less what they would have earned if they were cutting and loading.

It therefore appears that mechanical loading may not be sufficient to offset the manpower shortage in the crop season that has occurred since 1972 and consideration must be given immediately to the introduction of mechanical harvesting, as many inter-related factors must be taken into account and considerable time is required before any programme of mechanical harvesting can be implemented. It has been pointed out that about three years are required by even the most efficient and mechanically experienced managements to develop a smoothly-operating mechanical harvesting operation and many more years would elapse before an entire estate could be brought to a condition suitable for mechanical harvesting.

Two members of the agricultural engineering staff undertook a visit to Réunion island in November, under the auspices of the *Comité de Collaboration Agricole Maurice-Réunion-Madagascar*, to study recent developments there in the mechanization of harvesting operations. Of special interest were field preparation for mechanical harvesting and the performance of two chopper harvesters and one wholestalk harvester, which were already in use.

Cane planter

A DON H3DSF cane planter was also demonstrated during the year. The main interest of a mechanical cane planter lies in the possibility of maintaining, if not increasing, the actual rate of "petite saison" planting. However, present methods of field preparation, fertilisation practices, and the planter itself may have to be modified before mechanical planting can be successful in Mauritius.

Experiments in progress

Effect of mechanical loading on subsequent ratoons

Three experiments have been laid down to determine the effects of the use of mechanical loaders on yields of subsequent ratoons. In two of them (in S 17 and M 377/56 fields at FUEL), the yields in plots which have been hand cut and hand loaded will be compared with those in plots which have been hand cut but machine loaded with a TOFT HL 300 loader, whilst in the third experiment, mechanical loading has been carried out with a SIMSON push-piler (in M 13/56 fields at Beau Plan).

Extraneous matter in mechanically loaded canes

In both the above-mentioned experiments at FUEL, 10 trailers of hand loaded and 10 of machine loaded canes were examined for extraneous matter. The extraneous matter percent gross weight of cane varied between 3.1 and 7.3 for hand loaded canes and between 5.4 and 9.3 for machine loaded canes in the S 17 fields, which were harvested in August without prior trashing. These results, however, are very difficult to compare as most of the loads were wetted by rain and no correction for moisture was applied. In the M 377/56 fields, which were harvested in October with prior trashing, the extraneous matter percent gross weight of cane varied between 1.8 and 2.8 for hand loaded canes and between 3.5 and 6.1 for machine loaded canes. In both experiments, extraneous matter found in hand loaded canes consisted of trash, green leaves and immature tops, while in machine loaded canes, some stones and even pieces of scrap metal were found as well.

Method of planting

As the majority of existing cane harvesters are only capable of cutting cane grown on flat ground or on a ridge, trials have been set up at three sites to compare yields obtained by three methods of planting : usual furrow planting, planting on flat ground, and planting on ridges. The types of soil included are : Low Humic Latosol, Latosolic Brown Forest and Humic Ferruginous Latosol. The varieties planted are : M 31/45, M 93/48, M 13/56, M 377/56, M 351/57, M 124/59, M 438/59 and S 17.

SUGAR MANUFACTURE

Deterioration of cane following burning & harvesting

Recent legislation has placed an obligation on the part of millers to accept burnt, immature, petite saison and virgin canes when a separate sucrose content test for such canes is authorised by the Cane Planters' and Millers Arbitration and Control Board. Concern was expressed with the provisions of the law, particularly in respect to burnt canes because (a) burnt canes deteriorate rapidly and the by-products of their deterioration, dextran in particular, can hinder factory throughput and efficiency and (b) some mill operators observed that analyses on stale burnt canes indicated surprisingly high apparent purities : this was believed to be due to the dextrorotatory effect of dextran and would tend to give a higher value for calculated sugar recovery than would be attainable industrially.

Accordingly, a trial was laid down at Belle Vue from 9.11.74 to 18.11.74 on cane variety M 442/51. Treatments were (a) unburnt cut, (b) burnt standing, (c) burnt cut and (d) unburnt standing canes as control. Each treatment was replicated five times. All cut canes were left on the ground in their respective plots. Cane samples were collected from each plot at intervals of 2-3 days over the duration of the experiment. No rain occurred and no irrigation water was applied to the cane during the trial.

Cane samples collected were ground in a Jeffco cutter grinder and juice extracted by hydraulic press at 200 bar pressure on subsamples of ground canes. The juice fraction was analysed for Brix, Pol, reducing sugars and dextran. Fibre content was calculated from mass of press cake.

Analytical figures pertaining to dextran proved to be erratic and were rejected after thorough investigations showed the very poor reproducibility of the Nicholson & Horsley technique used. Other results pertaining to the juice fraction were expressed as apparent purity and R.S. % Brix to eliminate the effects of drying out of canes (Figs. 12 and 13).

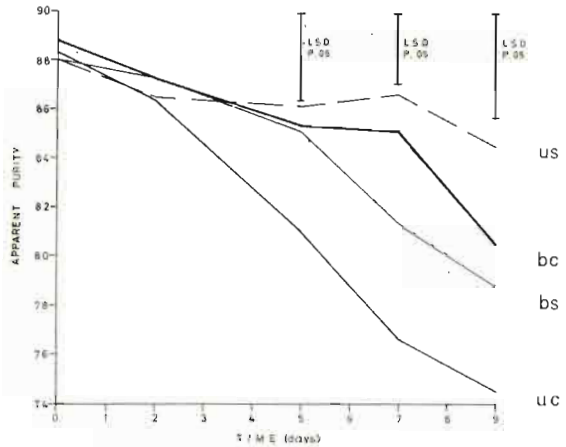


Fig. 12. Apparent purity of cane juice in burnt and unburnt canes. us = unburnt standing, uc = unburnt cut, bs = burnt standing bc = burnt cut

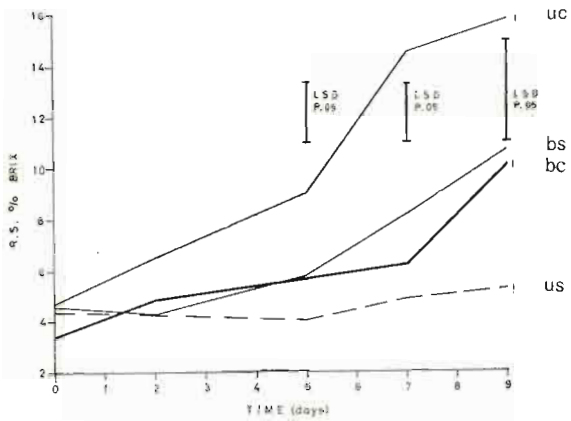


Fig. 13. Reducing sugars % brix of cane juice in burnt and unburnt canes.

The following conclusions were made :

(a) There was no evidence of increase in apparent purity; on the contrary, purity dropped with time over the experimental period of 9 days.

(b) The rates of deterioration of burnt cut and burnt standing canes were nearly the same, as shown by the evolution of both apparent purity and R.S. % Brix.

(c) As from day No. 5 unburnt cut canes showed a significantly higher rate of deterioration than all other treatments.

Assessment of milling value of cane tops

To review the validity of present recommendations on height of topping canes for milling, an investigation was conducted with three varieties (S 17, M 377/56 and M 438/59) in three contrasting environments (Highlands, F.U.E.L. and Belle Vue) at three harvesting times (mid-August, early October and late November). All canes were ratoons of about 52 weeks.

Canes collected from the fields were divided into four portions :

Portion A : internodes 1, 2, 3
Portion B : ,, 4, 5, 6
Portion C : ,, 7, 8, 9
Portion D : remaining lower part of stalk.

Each portion was weighed and analysed for fibre, pol, brix, reducing sugars and ash.

Analytical data were used to calculate expected recoverable sugar % cane for each portion on the assumption of 4 parts pol being bound per 100 parts fibre and of a final molasses purity of 40. For all varieties and locations considered, portion C, which is normally sent to the factory under present practice, was found to be milling material of value and portion A was not.

As for portion B, the results for Highlands and FUEL were so variable that no conclusion could be drawn. However, at Belle Vue an increasing trend in estimated recoverable sugar with time for portion B was found for all three varieties (Table 27).

Table 27. Characteristics of internodes 4, 5 and 6 of cane varieties S, 17 M 377/56 and M 438/59 at Belle Vue

Variety	*Time of harvest*	*Fresh wt. of internodes 4, 5 & 6 % fresh wt. of whole cane*	*Estimated recoverable sugar % fresh wt. of internodes 4, 5, 6*
S 17	Mid August	3.0	3.96
	Early October	3.0	6.52
	Late November	4.7	10.83
M 377/56	Mid August	5.9	2.02
	Early October	5.6	2.97
	Late November	7.5	8.89
M 438/59	Mid August	5.8	2.95
	Early October	5.1	4.60
	Late November	8.0	10.40

Considering the apparent influence of the environment on the physiological qualities of the upper portions of the cane stalk, it is felt that no change in the general recommendation of topping at the level of the 6th internode can be formulated from the limited information available.

Chloride in sugar products

A Buchler-Cotlove chloridometer (Plate VIII) was acquired and its suitability for determining chloride in sugar solutions was investigated. Chloride content was determined ten times on a sample of final molasses and a statistical analysis of the data carried out. The method proved to be reliable, chloride % Brix averaging 2.81 $\pm$ 0.05 at 95% confidence level.

An attempt was then made to assess sucrose losses during juice evaporation using chlorides as reference. It has been reported that chloride is a soluble juice constituent which passes through the process unchanged. Hence if the sucrose/chloride ratio is calculated for clarified juice entering the evaporator and compared to the ratio for the corresponding syrup leaving the evaporator, it should be possible to assess losses of sucrose. Should there be a decrease in sucrose/chloride ratio from clarified juice to syrup, the difference in the ratio would give an estimate of the destruction which had taken place. Destruction of Brix would show in a decrease in the Brix/chloride ratio on passing from clarified juice to syrup.

Weekly composite samples of clarified juice and syrup were collected during 6-7 weeks at two factories and frozen pending analysis. Accidental thawing resulting from breakdown of the refrigerating unit caused deterioration of the samples. However, since the weekly composite samples had been made up of daily composite samples, which had been analysed on a routine basis at the factory for Brix, sucrose and reducing sugars, the weekly mean factory values for Brix, sucrose and reducing sugars were used in conjunction with chloride content of the corresponding weekly composite samples to calculate Brix, sucrose and reducing sugars to chloride ratios. The figures so obtained were confusing, Brix, sucrose and reducing sugars to chloride ratios being found to be systematically higher in syrup than in clarified juice. This could have arisen from sampling and/or analytical errors or inadequacy of the technique. This last point will have to be thoroughly investigated.

Assessment of value of Floxin as a clarification aid

This clarification aid received from India was tested at intervals during the crop, on limed juice from different factories, with negative results. Towards the end of the season a factory encountered clarification difficulties and it was decided to take the opportunity to compare Floxin with two clarifi-

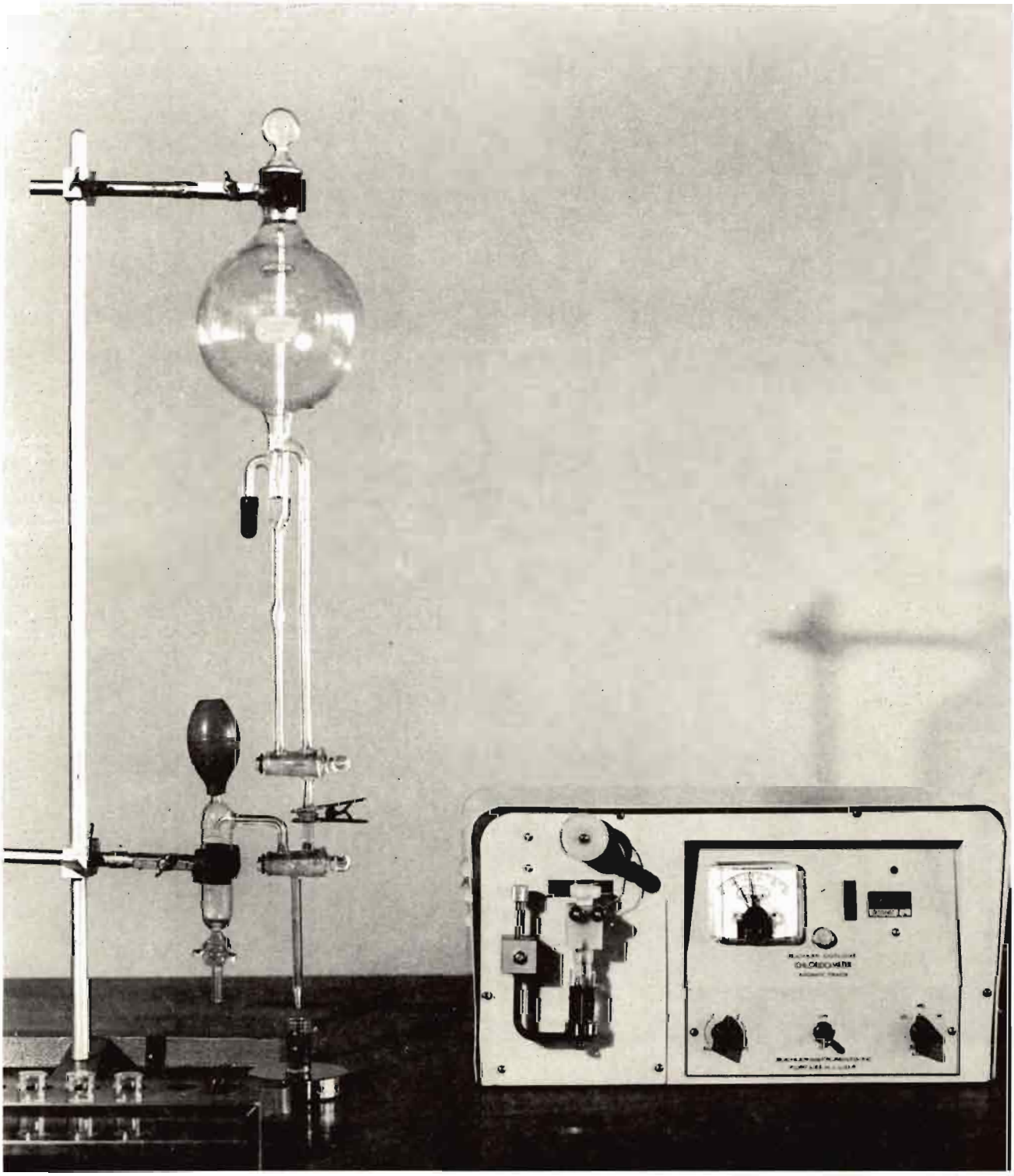


Plate VIII. Buchler-Cotlove chloridometer

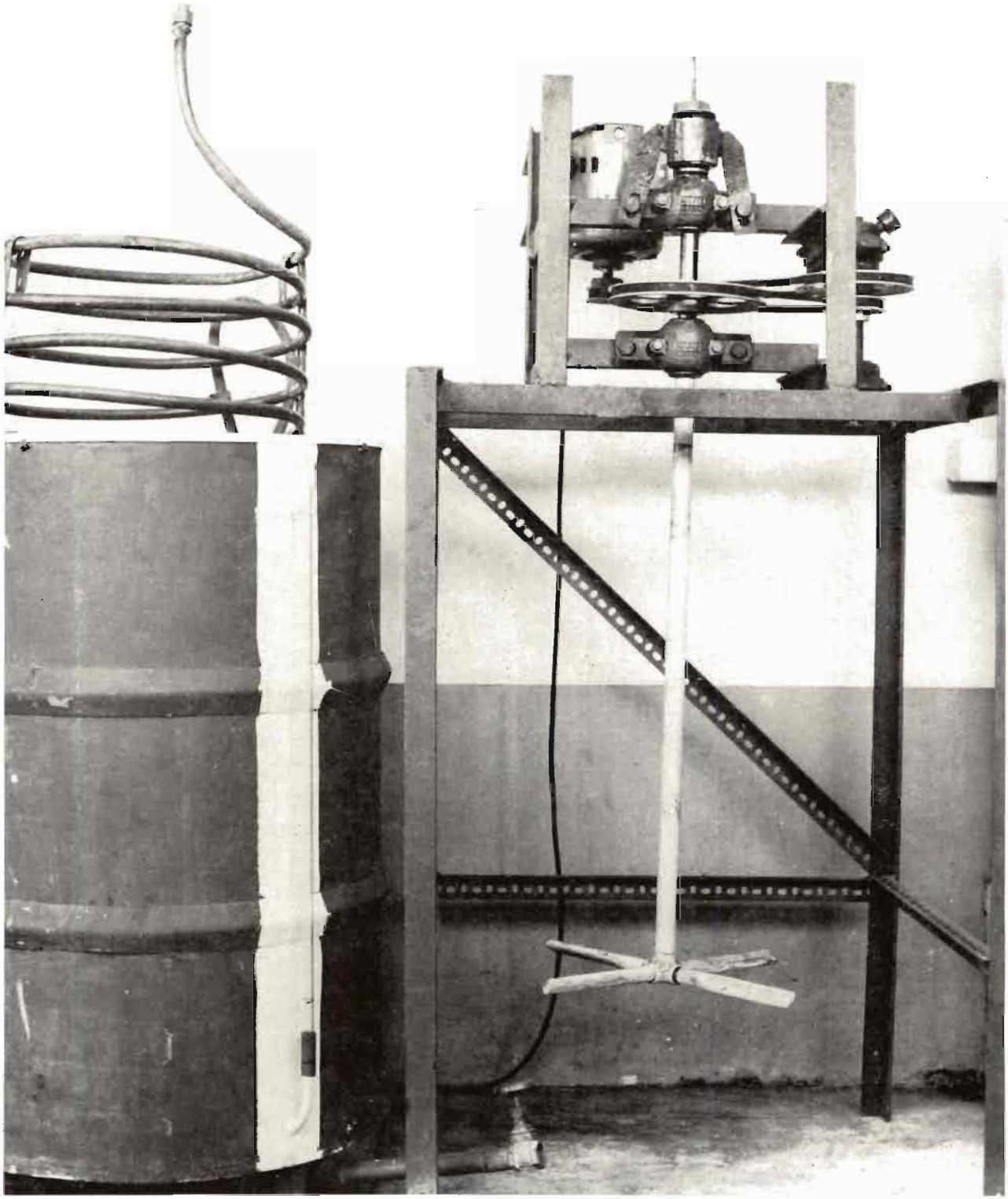


Plate IX. Pilot fermenter components. *Left*, fermenter tank and cooling coil. *Right*, air-inducing agitator.

cation aids commonly used locally. Tests were carried out using a Fletcher settling test unit without stirring. Floxin used at the rate of 1-8 ppm (recommended rate 2-3 ppm) gave no response. It must be pointed out that Floxin does not dissolve properly following the technique recommended by the manufacturers. Other techniques tried were equally unsuccessful.

Evaluation of starch hydrolising bacterial enzyme Sp 95

Experiments were undertaken to test bacterial enzyme Sp 95 under laboratory conditions.

In certain sugar producing countries where starch content of raw juice is very high, bacterial enzymes are usually added to 3rd, 4th or 5th evaporator vessel or to a special holding tank with optimal conditions for enzymic action. They are inactivated at temperatures above 82°C and this temperature determines to which evaporator vessel the enzyme should be added. Sp 95 is claimed to be more stable than traditional bacterial enzymes, which makes it possible to add the enzyme at an earlier stage in the process. It is also available in liquid form, which is an advantage.

During the laboratory experiments the enzyme was added at different concentrations to syrup of varying Brix. The inoculated syrup samples were kept in a constant temperature bath. The temperature-Brix combinations were selected to match those obtained in industrial practice. The effect of the amylase on starch and sucrose was determined at intervals of 10 minutes.

The enzyme was found to be free from invertase activity. The results of starch elimination are given in Table 28. The figures suggest that the high temperatures prevailing in the 1st vessel of the evaporator would partially deactivate the enzyme. The action of the latter would also be impaired in the end vessels of the evaporator. The action would be most active in the 2nd and 3rd vessels of a quadruple effect. It must be pointed out that under Mauritian conditions, reduction in starch content of mixed juice obtained through the action of enzymes naturally occurring in the juice has so far proved sufficient to ensure good refining qualities of raw sugar. In the Mauritian context therefore, the use of bacterial enzymes would only be justified if enzymic process with natural enzymes ceased to be an adequate measure for elimination of starch.

Table 28. Effect of bacterial amylase Sp 95 on starch in clarified juice and syrup

Temp. of incubation (°C)	*Brix of product*	*Enzyme concentration ppm cane*	*% Starch elimination after 10 minutes time intervals*			
			0	*10*	*20*	*30*
100	20	5	0	30	23	22
90	25	5	0	83	92	96
95	35	5	0	40	61	71
84	35	10	0	30	45	55
60	67	20	0	0	0	7

Exhaustibility of final molasses

A series of eleven boiling down tests were carried out on final molasses from various factories. The aim of this work was to derive a simple formula to enable expected purity of final molasses to be calculated from analytical data that can be obtained at factory laboratory level.

The boiling technique involves the following steps : dilution of the original molasses to around 60° Brix to facilitate introduction into a 10 litre laboratory vacuum pan, concentration to around 600 poise at 50°C, seeding with fine granular sugar, controlled evaporation and finally air cooling in a lagged laboratory crystallizer for 24 hours. The objective is to bring the saturation temperature of the mother liquor of the artificial massecuite to 50°C.

Separation of mother liquor is effected by pressure filtration.

The original final molasses as well as the exhausted ones obtained from the boiling down tests are analysed for refractometric Brix, moisture content (Karl Fisher), sucrose (Jackson & Gillis No. 4), reducing sugars (Lane & Eynon) and sulphated ash.

Statistical analysis of the data has shown a high degree of correlation (98.88) between True Purity and Gravity Purity for 22 molasses samples considered. The regression equation was found to be :

$$\text{True Purity} = \text{Gravity Purity} + 3.32$$

Multiple regression analysis was carried out using analytical results pertaining to the eleven molasses under consideration, and a relationship was established of the form :

$$\text{Expected Gravity Purity} = A \times \text{original Gravity Purity} - B \frac{\text{Reducing sugars}}{\text{Ash (sulphated)}} + C$$

It is envisaged to continue this work to include molasses from all 21 Mauritian factories.

Mud filtration trials at Bel Ombre factory

A "Lainyl" filter cloth was fitted over the drum of the EIMCO rotary vacuum filter at Bel Ombre to investigate if this equipment could, without major alterations, be operated along the same lines as the Rapi Floc System. The factory is also equipped with a pressure filter operating in parallel with the rotary one. This arrangement provided flexibility for sharing mud load between the two filters. The general practice at Bel Ombre is to handle as much mud as possible at the rotary filter on account of better de-sweetening and sanitation as compared to the pressure filter. The same practice was followed after installing the filter cloth. On visual examination filtrate appeared to be of better quality than previously at approximately the same filtering capacity. Some mud retention tests were carried out but data obtained so far are insufficient to assess the merits of using the filter cloth. It is planned to give further attention to the matter next season.

Table 29. Analysis of average sample of molasses
(1972 season)

Character	*% Molasses*
Dry matter	78.9
Brix	86.4
Sucrose	31.3
Reducing sugars	17.7
Sulphated ash	15.2
Gums	3.73
Wax	0.37
Starch	0.44
Glutose	4.95
Acotinic acid	3.34
Calcium (CaO)	1.60
Magnesium (MgO)	0.70
Chlorides	2.53
Potash (K_2O)	4.67
Sodium (Na_2O)	0.04
Phosphates (P_2O_5)	0.18
Iron (Fe_2O_3)	0.04
Aluminium (Al_2O_3)	Traces
Total Nitrogen	0.80
Sulphates (SO_4)	2.48
Silica (SiO_2)	0.55

Characteristics of local molasses

A thorough analysis of a sample of average Mauritius molasses that had begun in 1973 was terminated during the year. The sample was obtained from the Cane Planters and Millers Arbitration & Control Board and was derived from bulked weekly samples from the 21 factories for the 1972 season. The results are given in Table 29.

Advisory work

Problems relating to the operation of the Fives Lille Babcock continuous vacuum pan at Mon Loisir, to boiling house losses at Mon Désert-Mon Trésor, and to laboratory analytical determinations at Beau Plan, were investigated upon request by the management of those estates and reports submitted to those concerned.

Miscellaneous

Expected and actual true purities of final molasses as calculated by factory chemists were published monthly.

Issues of weekly chemical control figures were published throughout the crushing season.

A total of 15,821 samples of canes were analysed for the various Divisions of the Institute and for Estate Agronomists. This represented a marked increase over the preceding year's figure of 12,961 and was due partly to an increasing number of analyses being carried out during the growing season for the Plant Physiology Division.

BY-PRODUCTS

Steamed bagasse as a source of energy for ruminants

Tests to assess the digestibility of steamed bagasse were carried out with four sheep. The sheep were fed only steamed bagasse for a week and the faeces collected and analysed.

The apparent digestibility $\frac{(\text{ingested} - \text{faeces})}{\text{ingested}}$ of dry matter in the steamed bagasse was as high as 40%. These values are higher than those obtained by the *in vitro* technique.

Whole cane as cattle feed

Five field trials were laid down in March to study the effect of time of harvest and age of cane on yield and cane composition. Unfortunately, two of these trials were accidentally destroyed by fire but the others at Beau Champ, St. Antoine and Terracine are being harvested every three months, although two of these have been affected to some extent by drought.

Disposal of vinasse

Owing to its low pH, distillery vinasse when disposed of in irrigation water causes severe corrosion of ferrous parts of irrigation equipment.

Laboratory trials were accordingly carried out with the object of increasing the pH of vinasse by growing *Candida utilis* yeasts on this effluent. A rise in pH from 4 to 7 was obtained in the course of 18 hours.

It would therefore appear that it is technically possible to reduce the aggressiveness of vinasse by subjecting it to the action of *Candida utilis*. However, cooling of the vinasse prior to fermentation may be a serious obstacle to adoption of this technique on an industrial scale.

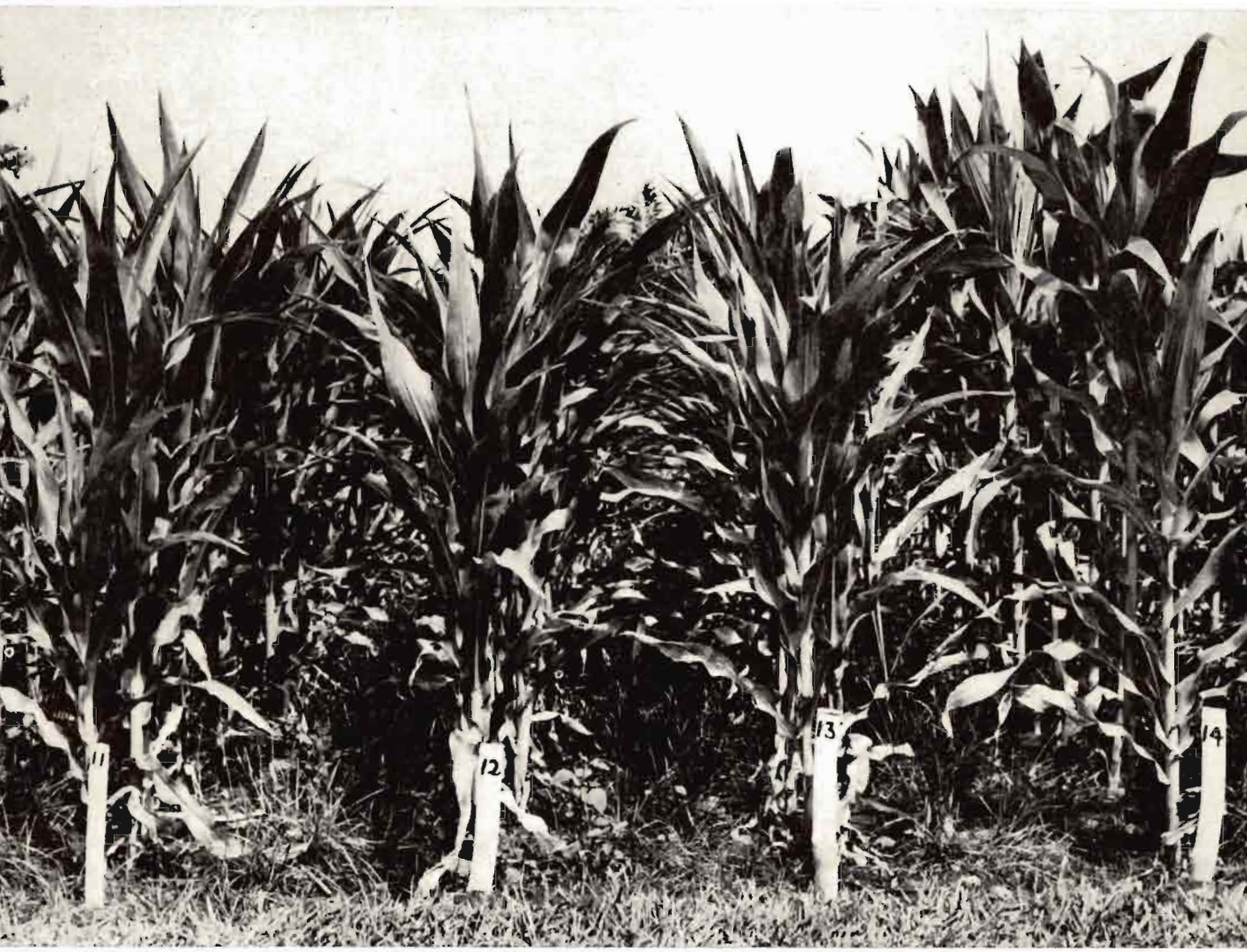
Yeast production

As a corollary to the experiment just described, studies were initiated on the production of feed yeasts with the species *Candida utilis*, using the waste liquor from alcohol distilleries as substrate. Tests were carried out under controlled and aseptic conditions in the laboratory, using a rotary shaker, to find the optimum conditions for maximum production by altering addition of nitrates to the substrate, temperature and time of fermentation.

A pilot fermenter (Plate IX) of effective capacity 100 litres and embodying an air-inducing agitator was designed and constructed. In a trial on vinasse from the O.K. Distillery and using the fermenter, yield in *Candida utilis* equivalent to 6.2 kg dried yeast/100 absolute alcohol was obtained and this was accompanied by a pH rise to neutrality.

Production of fermented beverages from cane juice

The production of alcoholic beverages by the fermentation of cane juice was investigated using the yeast species *Saccharomyces oviformis* and *S. carlsbergensis*. Using techniques normally applied, and stopping the fermentation process at the right time, a tasty cider-type beverage was obtained. It is thought that this beverage could become popular, especially among tourists, and that its production on a semi-industrial scale should be tried to run a market test.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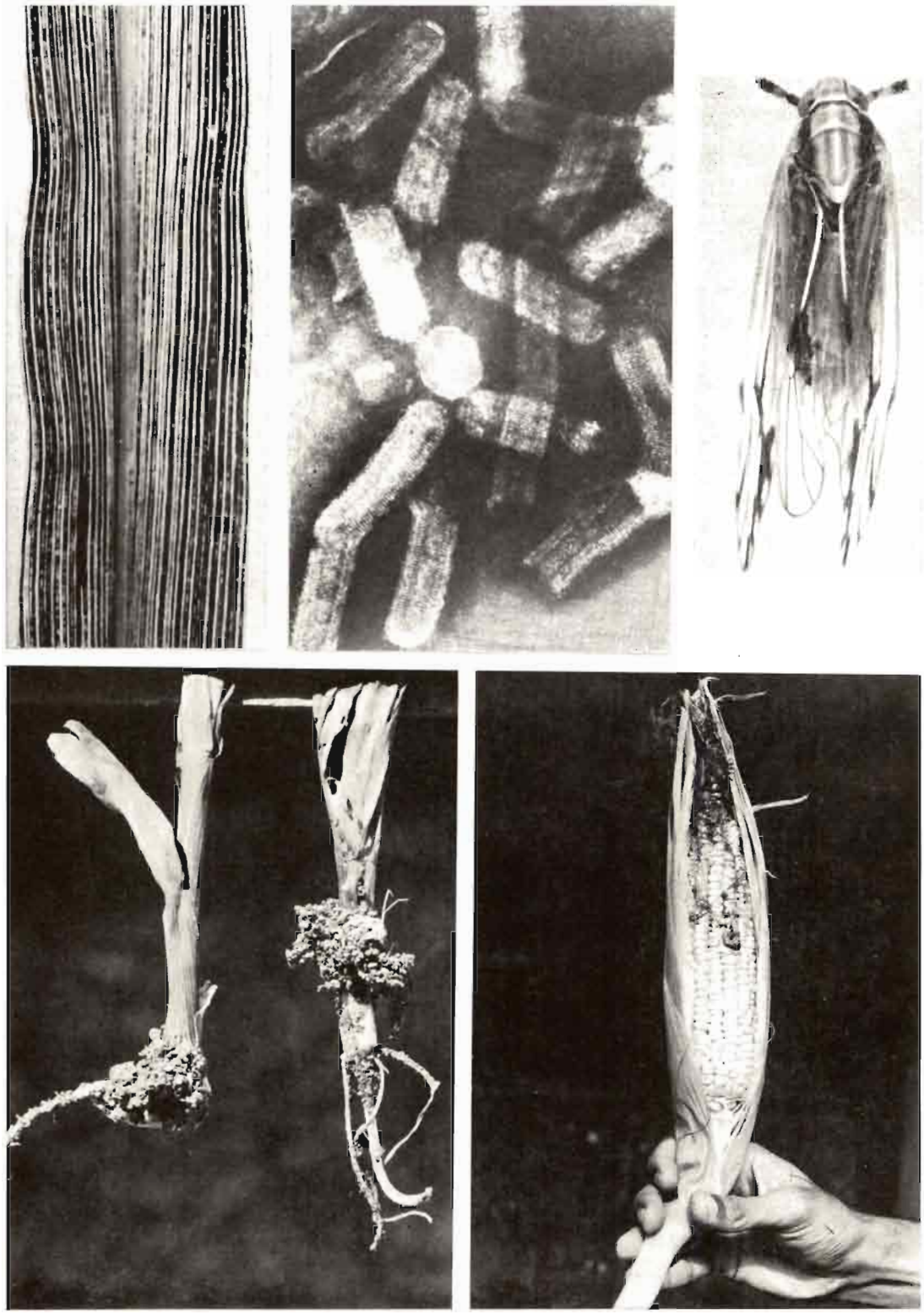


Plate X. *Top*, Stripe disease (Mosaic) of maize showing leaf symptoms, electron micrograph of virus particles, and the vector *Peregrinus maidis*. *Bottom left*, maize attacked by webworm (*Angustalius*) showing the larval gallery of silk and soil attached to the plants and, *right*, a cob attacked by the borer *Heliothis armigera*.

MAIZE

Agronomy and Plant Breeding

Breeding and Selection

The following stages were reached in the in-breeding programme for the production of local hybrids :

a) Sixth generation selfing of the basic material from Savanne and Flacq.
b) Fifth generation selfing of the stock from Morne, Pailles, Nouvelle Découverte, Richelieu and Solitude.
c) Fourth generation selfing of the material from Rodrigues.

A number of homozygous lines, showing the 'erect-leaf' character (see introductory photograph), which may be advantageous for maize cultivated in sugar cane interrows, have been selected and are to be tested for combining ability and subsequently used in production of single-cross hybrids.

Test-cross hybrids

Twenty seven homozygous lines selected from the material from Rodrigues were grown at Pamplemousses with a single-cross tester (*Dekald XL 24*). The resulting test-cross hybrids will be evaluated in replicated field trials in 1975.

Synthetic Varieties

In the programme started in 1972, experimentation continued with three of the four synthetic varieties produced. This was based on S_1 inbreds from the open-pollinated "local" variety in their second cycle of selection. Many undesirable characters have been bred out of the inbred lines. Synthetic varieties are being developed using the advanced generation inbred lines now available.

Variety Trials

Yield trials with new hybrids from France, South Africa and Yugoslavia (kindly supplied by the Universal Development Corporation (Pty) Ltd.) were continued. The hybrids were grouped according to age at maturity and planted at different densities. Table 30 shows the experimental yields of the hybrids in each maturity group at two locations, Réduit and Pamplemousses, and at two planting dates, March and September, compared to the control chosen for each group. Hybrids *Adour 220*, *Adour 250*, (Group I), *Adour 500* (Group III) and *Pioneer 88*, *Pioneer 95*, *Pioneer 353*, *NPP* × *K64R* (Group V) yielded well and are to be further tested under more diverse climatic conditions in 1975.

Of the Yugoslavian hybrids planted at 2 different densities, the most promising were *YU ZPSC 3*, *YU ZPSC 46 A*, *YU ZPSC 71 C* and *YU ZPSC 4* (Table 31).

Further trials were carried out with the high-yielding hybrids from the 1973 trials (*Vide* Ann. Rep. 1973, pp. 55-56) to assess their adaptability to different regions. The trials were planted in March and September at Belle Rive and Union Park under non-irrigated conditions. The two sites are in the super-humid zone, where conditions in March are generally considered to be unsuitable for maize production. The results (Table 32) indicated that hybrids *LG 11*, *Anjou 360*, *United 530*, *Dekalb 12*, *SSM 56* and *SSM 20* can yield well in the superhumid zone without irrigation and show adaptability to diverse climatic conditions.

Table 30. Yields and maturity behaviour of introduced maize hybrids planted in March and September at two locations. (Controls in italics)

VARIETY.	REDUIT				PAMPLEMOUSSES			
	Yield kg/ha at 12% m.c.		*Time to 50% silking (days)*		*Yield kg/ha at 12% m.c.*		*Time to 50% silking (days)*	
	March	*September*	*March*	*September*	*March*	*September*	*March*	*September*
				GROUP I — (65,000 plants/ha)				
INRA 258	*3227*	*5524*	*38*	*44*	*1439*	*3837*	*38*	*40*
PAG21	2383	4736	37	45	761	3363	39	36
ADOUR 220	1883	5597	39	45	493	4060	38	38
ADOUR 250	2466	5187	38	44	946	4605	36	39
MA 2047	3051	5349	39	45	969	3892	38	41
				GROUP II — (57,000 plants/ha)				
ANJOU 360	—	*7280*	—	*49*	—	*6032*	—	*42*
INRA 310	2688	6700	41	48	2633	5980	39	42
FUNK 433	—	5034	—	52	—	7219	—	43
				GROUP III — (50,559 plants/ha)				
UNITED 530	*3970*	*7358*	*47*	*49*	*3195*	—	*45*	—
ANJOU 500	3422	6334	44	48	1398	—	43	—
ADOUR	3624	6122	46	49	1382	—	45	—
PAG 45	1974	5361	45	49	668	—	46	—
17651	2536	6506	46	49	837	—	44	—
				GROUP V (38,000 plants/ha)				
LOCAL (improved)	*3171*	—	*77*	*74*	*2176*	*6167*	*76*	*70*
PIONEER 44	4330	7258	53	57	2029	5619	53	54
PIONEER 66	—	7252	—	54	1901	6653	51	49
PIONEER 82	2496	6559	50	55	1123	6835	51	49
PIONEER 88	—	8011	—	54	2180	6892	53	51
PIONEER 95	4949	8285	54	60	3564	6906	54	55
PIONEER 353	4098	8581	59	62	2669	7918	56	56
SA 60	3773	6755	55	56	2726	—	55	—
PP × K 64 R	3429	7195	50	54	2228	6020	53	51
NPP × K 64 R	4567	7733	53	56	2387	6811	54	53
REGOPISAR	5174	7321	58	63	3278	7826	60	58

Table 31. Performance of Yugoslavian hybrids planted at Reduit in September 1973 and March 1974 at different densities. (Controls in italics)

VARIETY (Yugoslavia)	*SEPTEMBER 1973 Density : 37,920 plants/ha*			*MARCH 1974 Density : 50,559 plants/ha*		
	Yield at 12% m.c. (kg/ha)	*50% silking (days)*	*Plant height (cm)*	*Yield at 12% m.c. (kg/ha)*	*50% silking (days)*	*Plant height (cm)*
Anjou 500	—	—	—	*3,005*	*46*	*198*
United 530	—	—	—	*5,055*	*47*	*222*
Yu ZPDC 370	4,494	49	186	2610	43	206
Yu ZPSC 3	4,828	61	194	5,065	54	245
Yu ZPSC 4	5,693	61	204	3,986	55	237
Yu ZPSC 46A	5,472	52	195	4,181	44	206
Yu ZPSC 48A	5,344	52	192	2,984	44	203
Yu ZPSC 58C	4,548	53	201	2,695	50	229
Yu ZPSC 71C	4,626	61	175	5,920	55	250
Yu ZPSC 80B	4,768	60	180	3,147	51	223
Yu ZPTC 75	5,005	61	176	2,998	56	233

Table 32. Yields and maturity behaviour of maize hybrids from the 1973 trials when planted in March and September in the superhumid zone and grown without irrigation

HYBRID	*BELLE RIVE*				*UNION PARK*			
	Yield kg/ha at 12% m.c.		*Time to 50% silking (days)*		*Yield kg/ha at 12% m.c.*		*Time to 50% silking (days)*	
	March	*September*	*March*	*September*	*March*	*September*	*March*	*September*
				GROUP I — (65,000 plants/ha)				
INRA 258	1889	3638	42	51	3266	4230	40	47
ANJOU 256	2489	—	43	—	3922	—	40	—
DEKALB 216	2417	2069	42	52	2853	—	42	—
INRA 240	2029	3069	43	52	2432	4531	42	49
LG 7	1884	3688	42	50	2849	3721	39	47
LG 11	3181	4494	41	51	3645	4998	39	47
MA 2047	2254	4458	42	51	2353	4825	41	48
				GROUP II — (57,000 plants/ha)				
ANJOU 360	—	6059	—	56	—	7001	—	52
INRA 400	3188	5067	49	55	3167	4105	47	53
UNITED 352	4565	4525	54	59	2991	6093	51	56
				GROUP III — (50,500 plants/ha)				
UNITED 530	5103	4335	53	58	4102	4920	52	53
ANJOU 500	1360	2707	52	58	2070	4221	50	52
ANJOU 510	2161	2247	53	57	2200	4017	51	53
CARGILL 444	1865	3350	57	60	—	4645	—	55
DEKALB XL 24	2064	3867	52	59	—	4937	—	55
LG 19	—	—	—	—	3175	4809	48	52
				GROUP IV — (41,350 plants/ha)				
UNITED 32A	2097	3012	53	63	—	3429	—	56
PROVENCE 610	2917	3335	54	60	3154	5003	53	56
DEKALB 12	2346	5920	53	61	1823	6740	51	61
				GROUP V — (38,000 plants/ha)				
LOCAL		3598		80		4074		71
SSM 20		5062		73		6304		63
SSM 40		5463		70		5697		60
SSM 44		6171		70		5392		61
SSM 56		6281		71		6608		60
Mean day temp. (°C)	23.7		25.2		22.4		25.8	
Mean night temp. (°C)	16.5		17.0		16.8		18.1	
Rainfall (mm)	872		564		890		566	

Cultivation of hybrid maize in interrows of ratoon cane

Cane and sugar yields were recorded from the plots of ratoon cane at Beau Plan, Rose Belle, Savannah and Saint Antoine in which maize had been planted in the interrows at different density-fertiliser levels in September 1973 (*Vide* Ann. Rep. 1973 p. 57). Data from each location were analysed separately. The F tests indicated no significant difference in yields of cane or sugar between the treatments. Table 33 shows the mean yields of maize, cane and sugar per hectare from the four localities.

Table 33. Yields of maize, cane and sugar from interrow planting of maize hybrid ANJOU 500 in ratoon cane in September 1973.

(Mean results from 4 localities)

*TREATMENT**	*Sugar cane tonnes/ha*	*Sugar tonnes/ha*	*Maize @ 12% m.c. tonnes/ha*
F0D0	97,290	10,210	—
F0D1	97,050	10,070	0,403
F0D2	94,370	10,070	0,623
F0D3	98,160	10,330	0,664
F1D0	98,590	10,020	—
F1D1	94,490	10,140	0,848
F1D2	98,050	10,070	1,301
F1D3	92,070	9,650	1,285
F2D0	104,280	10,640	—
F2D1	98,950	10,050	0,922
F2D2	98,760	10,260	1,413
F2D3	95,040	9,930	1,491
F3D0	97,690	10,520	—
F3D1	99,940	10,550	1,038
F3D2	96,860	9,930	1,498
F3D3	94,250	9,880	1,538

* F0 = without fertilizer
F1 = 38 kg N; 19 kg P2O5; 31 kg K2O/ha cane interrows
F2 = 76 kg N; 38 kg P2O5; 62 kg K2O/ha cane interrows
F3 = 114 kg N; 57 kg P2O5; 156 kg K2O/ha cane interrows

D0 = without maize plants
D1 = 9,500 plants/ha interrows
D2 = 19,000 plants/ha interrows
D3 = 28,500 plants/ha interrows

It may be concluded that an early maturing maize at a density of 19,000 plants and fertilised with 76 kg N, 38 kg P_2O_5, 62 kg K_2O/3080 m row length may be profitably grown in every second interrow of ratoon canes (= 1 ha) without adversely affecting the sugar yields.

Effect of plant density on yield of the hybrid maize SSM 20

Yield and plant characteristics of the South African hybrid *SSM 20* when grown at different densities were compared in a trial with 4 replications planted in October at Pamplemousses. Each plot consisted of 4 rows 80 cm apart and fertilisation was at the rate of 237 kg N, 142 kg P_2O_5 and 284 kg K_2O/hectare. Yield and other data were taken from the two centre rows (Table 34)

Table 34. Yields and other characters of hybrid SSM 20 at different population levels.

Spacing between seeds (cm)	*Plant Population/ ha*	*Yield @12% m.c. (tonnes/ha)*	*No. of ears/m²*	*Height of ear setting (cm)*	*No. of Leaves per plant*
15	83,330	8,215	5.7	102	13.2
21	59,520	7,592	4.9	106	13.8
25	50,000	7,225	—	91	13.6
30	41,660	7,118	3.8	88	13.5
35	35,170	6,582	3.4	89	13.4

Grain yield increased with plant density, which had no significant effect on time of flowering, maturity or number of leaves, but had a marked effect on plant height and height of ear setting. The number of ears/unit area increased with plant density but the size of ears decreased.

Pests and Diseases

Cob borer

A survey to assess the extent of cob damage by insects was begun at the end of the year. When completed it should indicate the importance of *Heliothis armigera* (Plate X)and *Cryptophlebia leucotreta*, the main species involved. A search for parasites attacking these two borers was also begun as a preliminary to possible biocontrol measures against them.

Insecticide tests against cob borers were also in progress at the end of the year, although present observations do not indicate that insecticidal control methods could be put to practical use.

Webworm

The webworm, *Angustalius malacellus* (Plate X), caused gappy stands in some plantations in cane interrows. As attacks occur on newly germinated plants, a preventive method of insecticidal control, applied at planting or shortly afterwards, is required. Unfortunately, the locations of attacks seem unpredictable, although there is some reason to believe that they are most liable to occur in fields where the cane has been burnt. Two trials were carried out involving application of insecticides in granular formulation at planting and as sprays along the rows at germination. The results were not very satisfactory and further trials are planned.

Leafhoppers (Cicadulina spp.) and streak disease (virus)

Transmission of streak disease from maize to maize by the leafhopper *Cicadulina mbila* was demonstrated in the laboratory by carefully controlled experiments. Such transmission of the disease in the laboratory has occurred with great facility, while tests with other insects (*Peregrinus maidis*, *Cicadulina triangula*) were negative.

Two other species of *Cicadulina*, not previously recorded in Mauritius, were found during the year. One was identified as *C. triangula* Ruppel by the Commonwealth Institute of Entomology and the other awaits identification. *C. triangula* has been found commonly on the grasses *Stenotaphrum dimidiatum* and *Setaria* sp. nr. *sphacelata*, but also occurs on maize. In the laboratory, it breeds readily on all three and also on sugar cane. The unidentified species of *Cicadulina* appears to be less common than *C. mbila* and *C. triangula* and has been difficult to collect : it has, however, been taken on maize. Observations on the biology of all three species are being made.

Streak disease of maize, reported in 1972 to be confined to fields of the Morne area, Black River, was recorded from three other localities : Flacq, Réduit and Pamplemousses. The identity of the disease was confirmed in each instance by transmission to healthy maize by the vector *Cicadulina mbila*. This insect is widespread in the island and the disease is therefore likely to spread in other localities on the susceptible hybrids under cultivation at present. All of the ten hybrids grown in a field at Case Noyale became infected with streak. A virus disease survey carried out in the Black River area from February to November indicated that the disease is more severe in late, warm season plantations. Its incidence in maize fields of the local variety varied from 50-100% at Case Noyale, from 25-50% at Coteau Raffin and 0-25% in the Morne area. Very few plantations were affected in the drier season, when the incidence seldom exceeded 5%, although several fields of the hybrid *SSM* 20 grown under irrigation at Case Noyale at the end of the year showed a mean infection near harvest of about 25%. At FUEL hybrid *SSM* 20 was affected to a lesser extent, overall infection being under 5%. All other commercial plantations grown during the year on sugar estates were free from streak.

In addition to successful transmission of the disease in the laboratory from diseased to healthy maize by *Cicadulina mbila*, it was also similarly transmitted from diseased to healthy plants of sugar cane, the grass *Coix lacryma-jobi* as well as a few other grasses.

Different strains of the virus appear to exist in Mauritius, and so far three important ones have been identified : the sugar cane strain, the *Coix* strain and the maize strain. The sugar cane strain may infect *Coix* but not maize, the *Coix* strain infects both maize and sugar cane causing severe symptoms, while the maize strain is transmissible to *Coix* and cane but in the latter plant it causes only mild and often evanescent symptoms. It is possible that more than one strain is responsible for the epidemic on maize.

The disease has been detected in and successfully transmitted from the following grasses : *Brachiaria reptans*, *Cenchrus echinatus*, *Digitaria timorensis*, *Panicum maximum*, and *Paspalum conjugatum*, the last two being new host records for the disease in Mauritius. The strains involved are under study so as to elucidate the local reservoirs of the virus of importance to the two susceptible crops, sugar cane and maize.

Stripe Disease (maize mosaic virus)

Only a few cases of the so-called stripe disease were observed in maize fields during the year. Hybrid *SSM 20* grown at Case Noyale was infected to the extent of 2% in one field.

Inoculation of four varieties in the field in February using viruliferous *Peregrinus maidis* resulted in a low level of infection. Natural transmission from the infected foci thus established was also negligible and at harvest the total number of plants with stripe symptoms did not exceed 6.3% in *LG11*, the most susceptible of the four hybrids.

In the greenhouse, inoculation of ten hybrids with the viruliferous vector indicated that *U 530* was immune while all others became infected to the extent of 60-100%.

Electron micrographs of partially purified extracts from diseased maize leaves revealed the presence of bullet-shaped virus particles about 65 nm by 220 nm (Plate X). This identified the disease as corn mosaic or maize mosaic. Particles of the filamentous maize dwarf mosaic virus were also common in the leaf extracts indicating that this disease, which was reported in 1972, may be quite widespread in Mauritius without showing typical external symptoms. The assistance of Rothamstead Experiment Station is gratefully acknowledged for the electron micrographs.

Reaction of newly introduced hybrids to diseases

Twenty newly introduced hybrids were tested in two localities for resistance to maize rust (*Puccinia polyspora*) and maize blight (*Tetrametaspheria turcica*). With the exception of hybrid *SSM 20*, which had the same reaction to rust as the local variety, i.e. moderately susceptible, all showed susceptibility. Fourteen varieties proved more susceptible to blight than the local variety.

Miscellaneous Diseases

Irrigated fields on several estates were infected with bacterial stalk rot (*Erwinia* sp.). The disease may become destructive when irrigation is excessive, the bacteria being spread by soil splashings. A leaf blight symptomatised by discrete necrotic areas occurred at Montebello, Pamplemousses, FUEL and Case Noyale on hybrid *SSM 20*. Two bacteria isolated from affected leaves failed to reproduce the disease, which might be physiological.


CARDINAL


DESIREE


MARILINE


SPUNTA

XI. Control of potato blight by treatment with DPX 3217 combined with Dithane M 45.

POTATO

Introduction of varieties

The following varieties were received from the Institute for Research on Varieties of Field Crops, Wageningen, Holland: *Alpha*, *Arka*, *Cardinal*, *Désirée*, *Draga*, *Mirka*, *Monitor*, *Rector*, *Remedy*, *Spartaan*, and *Spunta*.

Variety trials

Trials were set up at Beau Plan and Ebène in May to compare the relative performance of 21 varieties in interrows of plant cane. Varieties tested previously were included for comparison with newly imported varieties. A randomised block design with four replications was adopted. In addition to the main trial in each locality, where blight was controlled by regular sprays of Dithane M 45, yields were determined, for the sake of comparison, in similarly replicated plots of the varieties grown alongside the main trials in each field but kept untreated for assessing their reaction to blight.

High yields were obtained in the treated plots at Beau Plan, varietal performance being on the whole more or less similar, except that *Désirée*, *Spunta* and *Mirka* were markedly superior to the others. The new varieties *Baraka*, *Eba*, *Cardinal*, *Monitor*, *and Remedy* gave yields ranging from 14.4 to 15.5 tonnes/6160 m row length (= 1 ha interrow plantation). At Ebène where conditions were less favourable, there were marked differences in yields between varieties, *Baraka*, *Remedy*, *Monitor*, *Eba*, *Désirée*, *Cardinal*, and *Spunta* being the best yielders. The importance of proper blight control for assessing the full potential of the varieties was apparent. Thus, in the absence of blight, varieties susceptible to the disease, such as *Désirée*, *Mirka* and *Spunta*, yielded much more than highly resistant varieties such as *Greta* and *Remedy*, whereas in the absence of treatment they did not. Certain varieties such as *Monitor* and *Eba* combined good yield potential with acceptable blight resistance.

Fertiliser trial

A trial with the variety *Mariline* was carried out to compare fertilisation with potassium chloride and potassium sulphate. As expected, no significant difference in yield was obtained. It is unlikely that any short term benefit can be obtained by the use of the relatively more expensive potassium sulphate because ammonium sulphate is by far the most important fertiliser used in Mauritius, in terms of tonnage imported, and its widespread use in sugar cane plantations has led to an enrichment of soils in sulphate.

Seed Potato Production

A performance test to assess incidence of leaf roll in seed potatoes produced locally in 1973 was carried out at Union Park Experiment Station in March. The results are shown below :

Origin of seed	*Mean % leaf roll*
Anna	4.1
Beau Champ	0.7
Beau Plan	0.9
Belle Vue	0.7
F.U.E.L.	0.6
Highlands	Nil
Rose-Belle	0.7
Tamarin	0.7

Out of a total of 467 tonnes of locally-produced seed potatoes delivered by the Agricultural Marketing Board in 1974, 232 tonnes were distributed to sugar estates and 235 tonnes to cooperatives. The performance of local seed sold in 1974 was most satisfactory, no rotting was observed in cut seeds and germination was excellent.

The large-scale distribution of local seed to all potato growers having led to successful results, it is now considered that the local seed production scheme has been launched. The evolution of this programme is summarised in Table 35. Henceforth the Institute will cease to be directly involved in the details of seed production, which will become the responsibility of a few approved growers. However, the Institute will continue to ensure seed certification through the establishment of an Inspection Service and will also be directly responsible for the bulking up of new varieties and stock seed imported from Europe as well as streamlining and improving the seed production scheme whenever necessary.

Table 35. Seed Potato Production Scheme (1970 - 75)

Year	*Seed Production*		*% Total seed requirement*	*Phase in production scheme*
	Up-to-Date	*New varieties*		
1970	Nil	Nil	—	Screening of virus diseases. Study of epidemiology of major diseases.
1971	30 tonnes	1/2 tonne	2.5	Establishment of certification standards. Disease resistance testing of new varieties.
1972	55 tonnes	3 tonnes	5	Experimentation in trials and on semi-commercial scale to compare local with imported seed. Bulking-up of stock seed of Mariline. Storage experiments.
1973	478 tonnes	20 tonnes	40	Further experimentation to assess yield of local seed. Further storage experiments. Second multiplication of variety Mariline, tolerant to bacterial wilt.
1974	420 tonnes	126 tonnes	47	Bulking up of new varieties Mariline & Désirée. Plantation on commercial scale of seed produced in 1973. Clonal selection of varieties Mariline and Greta. Experimentation with several generations of local seed.
1975*	450 tonnes	250 tonnes	60	Plantation on commercial scale of varieties Mariline and Désirée. Importation of selected new varieties for bulking-up.

* Proposed programme.

A total of 546 tonnes of seed potato was produced in 1974. Seventeen tonnes of the variety *Mariline* bulked up at Beau Plan, Rose Belle and Réduit produced 105 tonnes of seed. Four hundred and twenty tonnes of Up-to-Date were produced on nine estates from A-certified seed imported from South Africa. In addition 20 tonnes of the variety *Désirée* were produced at Montebello by the Institute.

Data from three randomised block trials comparing 1st generation (imported), 2nd generation, 3rd generation and 4th generation seed (fig. 14) confirmed the value of locally produced seed even after three years of bulking-up locally. The mean incidence of leaf roll in the imported and the successive generations of local seed was 1%, 0.6%, 2% and 2% respectively.

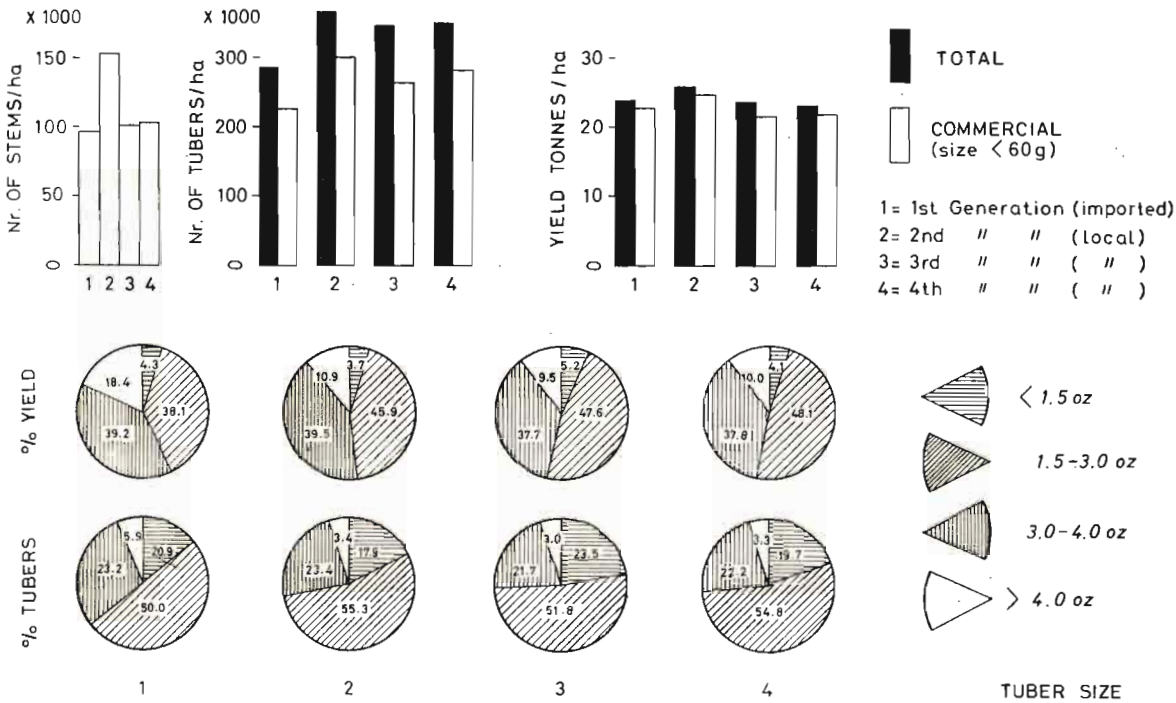


Fig. 14. Yields of seed potatoes of four generations.

Another trial showed no difference between seed produced locally from AA-certified and A-certified imported stock.

Yield data from seven varieties compared in randomised block trials over six successive generations (Table 36) indicate that seed potatoes may be bulked locally for many generations without appreciable deterioration in yield potential, provided a low level of virus incidence is maintained through efficient roguing and insecticide treatment.

Table 36. Yield (tonnes/hectare) obtained from 7 potato varieties for 6 successive generations multiplied locally

Variety	Generations					
	1st*	2nd†	3rd	4th	5th	6th
ALPHA	12.8	5.2	15.4	22.0	19.9	21.6
FURORE	12.8	11.4	18.2	22.5	20.4	18.7
GINEKE	11.4	15.4	14.5	16.8	16.1	14.2
MULTA	12.3	10.9	17.5	18.2	18.2	18.7
NASCOR	14.0	14.0	17.5	20.4	16.1	19.0
RADOSA	20.9	15.9	16.8	18.7	18.0	18.7
UP-TO-DATE	18.7	15.9	17.5	21.0	18.2	18.2

* Imported † Trial affected by bacterial wilt

Pests, diseases and weeds

Transmission of leaf roll by aphids

In 1973, two plots of 0.84 ha (1/5 arpent) each were planted with Certified Seed (leaf roll infection less than 1%) in May, July and September at three sites, namely Belle Rive, Union Park and Pamplemousses. One plot of each pair was regularly sprayed with systemic insecticides and the other left untreated. The very few plants showing seed-borne infection were rogued. At harvest, one medium-sized tuber was taken from each plant and the tubers so obtained placed in cold storage. In May 1974, the tubers were all planted at Belle Rive to determine the incidence of leaf roll symptom in the plants arising from them, i.e. to assess the extent of insect-borne disease acquired by the 1973 plantings. This proved to be negligible (< 1%) throughout.

The conclusion from this experiment was that infection of all plantings by viruliferous winged aphids from outside sources was virtually absent and that the insecticide treatments to minimise insect-borne infection were superfluous. This is the second experiment (see Ann. Rep. 1973) indicating that aphid-borne infection of potato plantations by leaf roll in Mauritius does not, under present circumstances, occur with facility.

Late Blight (Phytophtora infestans)

Blight was particularly severe in 1974. The early occurrence of weather suitable for its development resulted in the appearance of the disease by the end of March in the super-humid zone. From May to August the disease became widespread in several localities and complete defoliation was observed in a few plantations. The duration of the disease attack was roughly 20 days in the wetter localities and 45 days in the drier regions. Blight progress curves in different localities in 1974 are shown in Fig. 15.

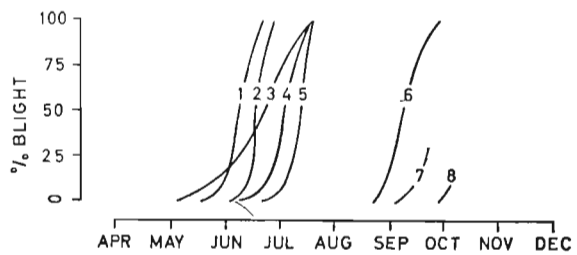


Fig. 15. Blight progress curves in different localities in 1974. 1, Solitude; 2, Union Park; 3, Ebène; 4, Tamarin 5, Belle Rive; 6, Réduit; 7, Beau Champ; 8, Réduit

Twenty four potato varieties, of which 15 were newly introduced, were tested for their reaction to blight in two contrasting localities, Highlands and Beau Plan. The results are given below :

Resistant to highly resistant	:	*Arka, Asta, Draga, Greta, Prevalent, Rector, Remedy, Spartaan.*
Moderately resistant	:	*Cardinal, Eba, Furore, Mariline, Monitor, Regale.*
Moderately susceptible	:	*Alpha, Baraka, Désirée, Element, Krasava, Mirka, Spunta.*
Highly susceptible	:	*Ilam Hardy, Sebago, Up-to-Date.*

An experiment was carried out at Union Park under exceptionally severe blight conditions to determine the effect of different dosages of Dithane M 45 applied at different intervals. Results are given in Table 37.

Table 37. Effect of Dithane M 45 applied at different dosages and intervals on blight at Union Park*

TREATMENTS			
*Dithane M 45 kg/ha** *(lb/arp)*	*Spraying intervals (days)*	*% blight at harvest*	*Plot yield kg***
2.2 (2)	10	97.0	28.3
2.7 (2.5)	10	92.5	37.6
3.2 (3)	10	81.2	29.5
2.2 (2)	7	73.7	32.7
2.7 (2.5)	7	51.2	40.7
3.2 (3)	7	35.0	46.6
2.2 (2)	4	5.3	47.4
2.7 (2.5)	4	4.5	49.0
3.2 (3)	4	1.3	55.8
Control	—	100	13.7

* Applied in 530 l/ha (50 gal/arp) with mist blowers
** Mean of 4 replicates. LSD P 0.05 = 7.0
P 0.01 = 9.4

There is evidence from the data that during epiphytotic conditions perfect blight control can be achieved through efficient spraying every 4 days with 2.7 kg Dithane M 45/530 l/ha of 11,550 m row (2.5 lb/50 gall/arp of 16,000 ft row).

An experiment carried out at Belle Rive with several stickers again showed no difference between the wetters/stickers tested and revealed that none could be a substitute for the proper timing of fungicide sprays.

A new systemic fungicide DPX 3217 from Dupont de Nemours Inc. was tested during the year in two trials at Union Park and another at Réduit, all under severe epiphytotic conditions. At Union Park spraying was started before blight set in and at Réduit it was started when 1-2% of plants had become infected. Results of the trials are given in Fig 16. DPX 3217 alone did not control blight; however, combined with Dithane M 45 it increased the efficiency of the latter and gave efficient blight control, under severe epiphytotic conditions in the super-humid zone, at a more practical spraying interval of seven days instead of the four needed with Dithane M 45 alone (Plate XI).

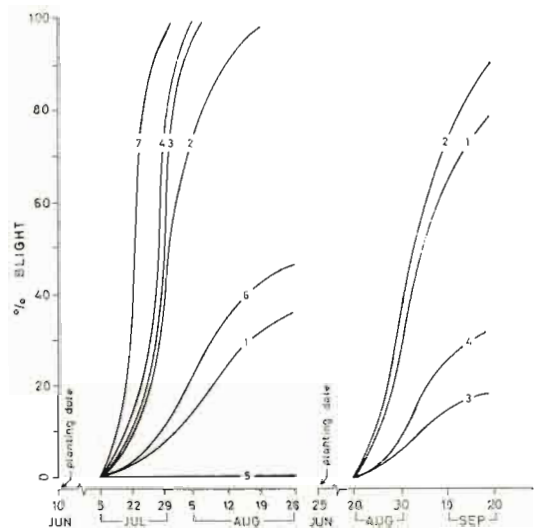


Fig. 16. Result of trials with fungicide DPX 3217 in two localities for controlling potato blight.

Left (Union Park):
1 : Dithane M 45 6 kg/ha every 7 days
2 : Dithane M 45 3 kg/ha every 7 days
3 : DPX 3217 0.38 kg/ha every 7 days
4 : DPX 3217 0.19 kg/ha every 7 days
5 : DPX 3217 0.38 kg + M 45 6 kg/ha every 7 days
6 : DPX 3217 0.19 kg + M 45 3 kg/ha every 7 days
7 : Control

Right (Reduit):
1 : M 45 6 kg/ha every 5 days
2 : M 45 6 kg/ha every 10 days
3 : M 45 6 kg/ha + DPX 0.38 kg/ha every 5 days
4 : M 45 6 kg/ha + DPX 0.38 kg/ha every 10 days

Seed treatment

Treatment with Benlate did not prevent rotting of cut seed inoculated with the soft rot organism and incubated under humid conditions, whereas the bactericide PP 073 from Plant Protection Ltd. reduced rotting under such conditions by 20%.

Results of two trials comparing cut and uncut seed and assessing the beneficial effect of seed treatment with Benomyl (Benlate) are given in Table 38. These confirmed (1) that cut seed is in no was inferior to uncut seed and (2) the efficacy of the fungicide treatment.

Experiments carried out in the laboratory with cut and uncut seed of variety *Up-to-Date* dipped in Benomyl (Benlate) suspensions of 0.125 — 2 g/l indicated no toxic effect of the fungicide. The number of sprouts from treated and untreated tubers was not significantly different.

Table 38. Yields from cut and whole seed potatoes with and without Benomyl (Benlate) treatment

	Benomyl treatment (g/litre)	*Plot Yield (kg)*
Whole seeds	0.5	40.2
	0.25	39.8
	0.125	35.4
	Control	36.9
Cut seeds	0.5	40.0
	0.25	39.1
	0.125	37.3
	Control	35.9

Clonal Selection of Potato Seeds

Clonal selection of the potato variety *Mariline* was initiated. About 100 tubers grown in an insect-proof greenhouse were screened serologically for viruses X, Y, S and M. Tests involving inoculation of *A6* potato leaves were also performed for the identification of viruses A and Y. Thirty eight per cent of the tubers were healthy, the remainder proved to have been infected with virus S or X or both. About 150 tubers obtained from the plants derived from the healthy tubers will be propagated in 1975 for further tests before bulking up as stock.

Clonal selection of the variety *Greta*, a good yielder with high resistance to potato blight and tolerant to bacterial wilt, is likely to be more difficult owing to the high incidence of virus X infection in the seeds that have been kept since its first introduction.

Bacterial wilt

Preliminary experiments were conducted to determine the influence of soil moisture on the incidence of bacterial wilt. Tomato plants were grown in pots of contaminated and sterile soil and the pots stood in water to have water tables at depths of 14 cm and 25 cm below the soil surface. The plants in contaminated soil started to wilt earlier and at a faster rate under the higher moisture régime (Fig. 17).

As no wilting occurred in sterilised soil under both water regimes, the potential of this technique for determining the level of wilt inoculum in different soils is being investigated.

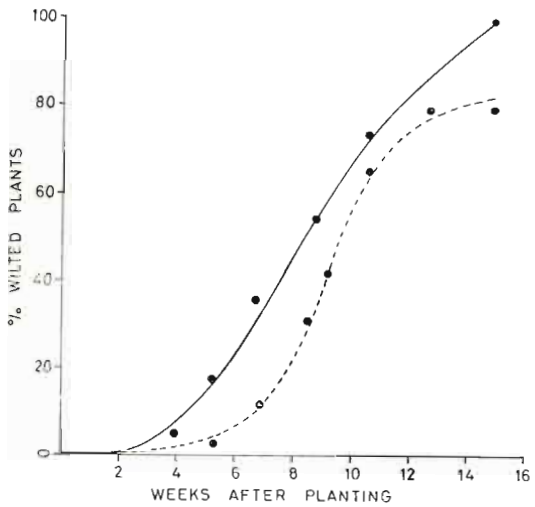


Fig. 17. Influence of soil moisture on incidence of bacterial wilt. Plain line, high level of water 14 cm from soil surface; broken line, low level of water 25 cm from soil surface.

Weeds

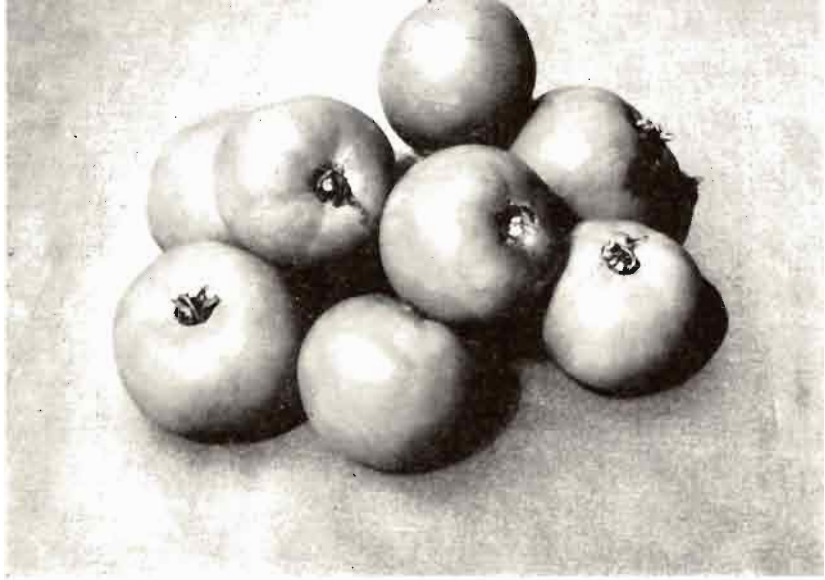
If chemical weed control is to be adopted in local potato plantations, certain cultural operations, such as the time and frequency of earthing-up will have to be altered. The present recommendation is to earth-up twice or thrice, beginning about four weeks after planting. Experimentation was therefore started at Réduit Experiment Station using variety *Désirée* in which eight treatments were compared :

1. Linuron 3 kg a.i./ha
2. Sencor 1 kg a.i./ha
3. Sencor 2 kg a.i./ha
4. Patoran 3 kg a.i./ha
5. Ametryne 2 kg a.i./ha

Sprayed 2 days after planting. Earthing up done once only at 7 weeks after planting.

6. Usual practice i.e. hand-weeding and earthing up done 4 and 7 weeks after planting.
7. Hand-weeding with one earthing-up at week 7.
8. No weeding ,, ,, ,,

Weed growth was poor throughout the duration of the experiment and there was no significant difference of yield when the potatoes were harvested three months after planting. Further experimentation is needed and is to be conducted in different localities with different varieties.



TOMATO

GINGER

GROUNDNUT

BEANS

PEAS

SOYA

GROUNDNUT

Trials to compare the performance of the newly introduced varieties of groundnuts were continued at Réduit and Pamplemousses under irrigated conditions. The yields of *Nung Yu 991* and *Tai Nan Sel. 9* were again the best among the "Spanish" types, with respective mean yields of 6,541 and 5,930 kg/ha (at 8% m.c.) from the two sites compared to a mean yield of 5,712 kg/ha for *Cabri. S.A. 156* and *Shulamit* were the best yielders of the "Valencia" and "Virginia" types, respectively.

SOYA BEAN

Introduction of varieties

The varieties introduced during the year were *Hardee*, *Jupiter*, *Biloxi*, *Bragg*, *Hutton*, *Cobb (F 66-1166)*, *Semmes*, *Improved Pelican*, through the courtesy of Dr. Edgar E. Hartwig of the Soybean Production Research, U.S. Department of Agriculture, Stoneville, Mississipi, U.S.A., and *Gilbert*, *Ross*, *Daintree*, *Leslie*, *Wills*, *Semstar*, *Davis*, *Bragg*, kindly supplied by the Department of Primary Industries, Brisbane, Queensland, Australia.

Variety Trials

Two randomised block trials with 4 replications were laid down early in April at Réduit and Pamplemousses, respectively, under irrigated conditions. The individual plot size was 2.5 m by four rows 40 cm apart. Spacing between seeds within the row was 5 cm. Data for the most promising varieties are summarised in Table 39. These varieties are to be further studied in 1975.

Table 39. Yield and other characteristics of some promising soya bean varieties.

(Mean for 2 sites : Réduit and Pamplemousses; planted 1-2.4.74)

Variety	*Origin*	*No. of days from 50% germination to flowering*	*Plant height (cm)*	*Oil% dry matter*	*Protein% dry matter*	*Seed yield* 12% m.c. (kg/ha)*
Semstar	Australia	23	38.5	17.5	29.6	1,980
Hardee	U.S.A.	27	27.3	17.3	35.8	1,569
Daintree	Australia	25	21.9	16.1	35.0	1,573
Lee 68	U.S.A.	30	25.4	18.4	33.0	1,411
Leslie	Australia	23	22.3	18.0	34.9	1,466
Ross	Australia	24	28.7	17.4	36.1	1,413
Semmes	U.S.A.	24	21.2	16.9	33.9	1,373
Shih Shih	Japan	32	31.3	—	—	1,219
Tai Tai Kao	Japan	36	50.1	—	—	1,589
Bragg	U.S.A.	24	28.3	17.8	34.9	1,224

* As the practice in Mauritius is to plant group of 4 rows with a free strip of 80 cm between groups, yield was calculated on an effective area of only 80% of a hectare.

COWPEA

The varieties *Coloona*, *Champion*, *Pyramid*, *Producer*, *Brandon*, and *Reeves* were received from the Department of Primary Industries, Brisbane, Queensland, Australia. They were planted in multiplication plots.

PEA

The yielding potential and other characters of 18 varieties were assessed in trials sown on 4th April and 30th July. Yields from the April sowing were relatively low and yields of both early and late varieties were similar, ranging from 4 - 9 tonnes/ha. The most promising varieties appeared to be : (i) Early type : *Chemin Long*, *Precovil*, *Tezier Regal*, *Meteor*; (ii) Late type : *Green Feast*, *Lancet*, *Clamart*, "*Local*".

BEAN

French bean

Yields of green pods were assessed at Réduit on 32 varieties sown on 4th April and 30th July, respectively, and grown at a density of 231,300 plants/ha. Yields from the July sowing were generally higher than those from the April sowing. Taking into account plant height and earliness of flowering, the varieties listed in Table 40 seem particularly interesting and are to be more intensively studied in 1975.

Table 40. Results obtained with more promising varieties of French bean at two planting dates

Variety	*Planted: 4.4.74*			*Planted: 30.7.74*		
	50% germination to 1st flower (days)	*Average plant height (cm)*	*Yield tonnes/ha*	*50% germination to 1st flower (days)*	*Average plant height (cm)*	*Yield tonnes/ha*
			Green beans (with strings)			
Canadian wonder	25	51	18,220	31	37	21,430
Long Tom	26	48	16,420	32	35	14,305
Pioneer	26	48	14,340	32	41	13,750
Bush Primeur	25	52	12,700	32	39	12,635
Local Red	27	52	12,090	32	35	12,895
			Green beans (stringless)			
Processor	28	39	13,535	32	33	15,240
Tenor	27	41	12,055	34	34	14,055
Coco nain blanc	25	48	13,890	31	34	11,160
Slender white	26	45	11,890	34	36	13,410
Saxa mangetout (Tézier)	25	41	11,890	31	33	14,070
			Yellow (Butter) beans (stringless)			
Beurre de Rocquencourt	29	38	14,500	33	35	19,485
Tézier d'Or	27	50	15,405	32	37	12,215
Beurre de Paradis	26	45	12,260	31	41	14,750

Navy bean

The varieties *Kerman* and *Gallaroy* were kindly supplied by the Department of Primary Industries, Brisbane, Queensland, Australia, and were planted in multiplication plots.

TOMATO

Introduction of varieties

Two varieties *OTB 2* and *Venus*, resistant to bacterial wilt in Martinique, were introduced through the courtesy of Mr. P. Daly of the *Institut de Recherches Agronomiques Tropicales et des Cultures Vivrières* of Fort de France, Martinique. Mr. P. Harel of the Universal Development Corporation (Pty.) Ltd. of Port Louis, Mauritius, kindly supplied seeds of the hybrid *VC II-20* from Philippines.

Varietal trial

A formal variety trial was laid down at Réduit with 16 varieties from France, Martinique and the Philippines but infection by bacterial wilt was so great that no worthwhile data on yield potentials could be obtained. However, it was observed that the varieties *Saturn* and *Venus* again showed very high resistance to the disease while the newly introduced hybrid *VC II-20* and the small tomato variety *OTB 2* were tolerant.

Spacing trial

The effects of planting rate were studied with variety *Saturn* grown at Réduit. Experimental details were as follows :

Sowing date : 23rd July
Planting date : 5th September
Spacings : Two rows 60 cm apart and three distances (30 cm, 45 cm and 60 cm) between plants within the row
Fertilisation : (i) Basic: 16 tonnes farmyard manure, 24 kg N, 140 kg P_2O_5 and 118 kg K_2O/ha
(ii) Complementary: 4 top dressings totalling 147 kg N and 118 kg K_2O/ha

Table 41 shows that the total tomato yield was highest at the narrowest spacing (60 × 30 cm).

Table 41. Results of tomato spacing trial (variety : SATURN) at Reduit.

Spacing	*Number of days from date of transplantation to*			*Yield (tonnes/ha)*
	First flowers	*First harvest*	*Last harvest*	
60 cm x 30 cm	26	66	115	44.4
60 cm x 45 cm	26	71	115	23.6
60 cm x 60 cm	26	71	115	26.7

Weed control

Two experiments were laid down, one in pre- and the other in post-emergence of tomatoes. In post-emergence, when the tomato plants were about 6 inches tall, three herbicidal treatments were compared to the control. These were Sencor at 0.5 and 1.0 kg and Cobex at 1.0 kg a.i./ha. At 0.5 kg/ha, Sencor caused slight temporary scorching of the leaves but the growth of the plants was not affected. At 1.0 kg/ha, however, the scorching was fairly severe, especially on younger plants, and plant growth was retarded. In the Cobex-treated plots, malformation of young leaves was observed but there was no effect on growth.

In pre-emergence, in addition to Cobex and Sencor, Patoran at 2 kg a.i./ha was included. Sencor at both rates did not affect germination or growth of the tomato plants. However, no tomato plants emerged in the Cobex-treated plots and only 30% germination occurred in the Patoran-treated plots.

It seems, therefore, that Sencor can safely be applied at either rate in pre-emergence of tomatoes. However, if it is to be applied in post-emergence of the crop, care must be taken to avoid spraying the foliage and dosage rate should be 0.5 kg/ha.

GINGER

Trials were carried out at California (super-humid zone) and Constance (humid zone) to to investigate the effects of mulching with dry cane trash and use of different rates of farmyard manure or sugar cane scums as organic fertilisers when supplemented with different rates of N, P, K fertilisers. Irrigation versus non-irrigation was also included in the Constance trial.

Table 42 summarises some of the results obtained. Mulching significantly increased yields under the different treatments. Increase in mineral fertilisation increased yields only in the non-irrigated plots in the relatively dry locality of Constance. The different rates of farmyard manure had no effect on yields while the higher rates of scums increased yields. Detailed results will be reported elsewhere.

Table 42. Effect of mulching, etc. on ginger yields

Analysis of variance

	CONSTANCE				*CALIFORNIA*	
	Irrigated		*Non-Irrigated*		*Non-Irrigated*	
	Scums	*FYM*	*Scums*	*FYM*	*Scums*	*FYM*
Mulching v/s Earthing up	**	**	**	**	**	N.S.
Mineral Fertiliser rates (1)	N.S.	N.S.	**	*	N.S.	N.S.
Organic Fertiliser rates (2)	*	N.S.	**	N.S.	*	N.S.

Significant difference in favour of treatment :
* 5% level of significance
** 1% level of significance
N.S. non-significant

(1) Mineral fertilisers : application rates/hectare

	A	B	C
Sulphate of ammonia	440 kg	880 kg	1320 kg
Single superphosphate	295 kg	590 kg	890 kg
Muriate of potash	355 kg	710 kg	1065 kg

(2) Farmyard manure or scums : application rates/hectare

(a) 23.7 tonnes (b) 47.4 tonnes (c) 71.1 tonnes

Statistical Tables

CONVERSION FACTORS

Length

1 cm	=	0.3937 (1/2.5400) inch
1 m	=	3.2808 (1/0.3048) ft
	=	1.0936 (1/0.9144) yd
	=	3.0784 (1/0.3248) Pied de Roi
	=	0.3078 (1/3.2484) gaulette*
1 km	=	0.6214 (1/1.6093) mile

Area

1 m^2	=	10.7639 (1/0.0929) ft^2
	=	1.1960 (1/0.8361) yd^2
1 ha	=	10000 (1/0.0001) m^2
	=	2.4711 (1/0.4047) acre
	=	2.3692 (1/0.4221) arpent*
	=	236.9211 (1/0.0042) perch*

Volume

1 l	=	0.2200 (1/4.5460) gall (Imp.)
	=	1.7598 (1/0.5682) pint (Imp.)
	=	0.0353 (1/28.3168) ft^3
	=	0.0010 (1/1000) m^3
1 m^3	=	35.3148 (1/0.0283) ft^3

Weight

1 kg	=	2.20462 (1/0.4536) lb (avoirdupois)
	=	0.00098 (1/1016) ton (avoirdupois)
	=	0.00110 (1/907.2) short ton (avoirdupois)
	=	0.00100 (1/1000) tonne or metric ton

Energy

1 J	=	0.0009048 (1/1055) BTU

Power

1 kW	=	1.341 (1/0.7457) HP

* = local measures

Table I. Area under sugar cane, 1970 - 1974
(*in thousand ha*)

Year	Area under cane Island	Area harvested					
		Island	West	North	East	South	Centre
1970	86.52	80.38	5.25	21.62	19.76	23.69	10.06
1971	86.39	70.89	5.24	21.14	19.68	23.59	10.24
1972	86.60	80.23	5.31	21.08	19.84	23.89	10.11
1973	87.37	80.95	5.37	21.41	19.95	23.90	10.32
1974	86.69	79.89	5.28	20.92	19.66	23.85	10.18

Table II. Sugar production 1970 - 1974
(*in thousand tonnes*)

Crop Year	No. of factories operating	Av. Pol.	Island	West	North	East	South	Centre
1970	21	98.8	576.2	47.0	158.1	125.3	184.8	61.0
1971	21	98.8	621.1	44.3	121.4	155.2	209.8	90.4
1972	21	98.7	686.4	51.1	164.9	164.8	218.2	87.4
1973	21	98.7	718.5	57.8	179.8	165.8	225.5	89.6
1974	21	98.7	696.8	50.0	161.4	175.6	218.9	90.9

Table III. Yield of cane, 1970 - 1974
(*in tonnes/ha*)

SECTORS	1970	1971	1972	1973	1974
ISLAND					
Miller-Planters	74.7	79.9	90.0	88.4	87.9
Planters*	51.4	49.5	65.5	64.0	58.3
Average	63.8	65.9	78.7	77.0	74.7
WEST					
Miller-Planters	84.4	83.0	94.3	97.6	88.2
Planters*	59.7	51.2	66.7	72.5	57.1
Average	73.5	68.7	82.0	86.5	74.9
NORTH					
Miller-Planters	82.7	65.6	91.7	90.8	88.9
Planters*	55.2	39.1	65.6	64.7	53.1
Average	65.2	48.8	75.4	74.4	66.6
EAST					
Miller-Planters	72.8	84.4	94.3	87.9	92.4
Planters*	44.8	51.4	63.0	59.5	60.2
Average	59.0	68.7	79.3	74.2	77.3
SOUTH					
Miller-Planters	74.2	80.1	87.5	87.5	84.6
Planters*	55.2	60.4	67.8	67.3	61.9
Average	68.0	73.9	81.3	81.3	78.0
CENTRE					
Miller-Planters	62.8	87.9	84.8	83.4	88.6
Planters*	42.9	56.9	65.9	61.6	65.2
Average	54.3	75.1	76.7	73.9	78.7

* *Inclusive of tenant planters*

Table IV. Average sucrose % cane, 1970 - 1974

Crop year	Island	West	North	East	South	Centre
1970	12.86	13.81	12.92	12.45	12.96	12.62
1971	13.41	14.00	13.52	13.06	13.61	13.14
1972	12.33	13.02	12.01	11.91	12.64	12.65
1973	13.06	13.84	13.00	12.73	13.12	13.19
1974	13.09	14.04	13.07	13.07	13.09	12.63

Table V. Yield of sugar, 1970 - 1974

A = Tonnes sucrose/ha

B = Tonnes sugar manufactured 98.5° Pol/ha

Crop year	Island		West		North		East		South		Centre	
	A	B	A	B	A	B	A	B	A	B	A	B
1970	8.20	7.19	10.15	8.97	8.42	7.32	7.35	6.37	8.81	7.80	6.85	6.08
1971	8.84	7.81	9.62	8.48	6.60	5.74	8.97	7.93	10.06	8.91	9.87	8.85
1972	9.70	8.56	10.68	9.58	9.06	7.85	9.44	8.32	10.28	9.15	9.70	8.68
1973	10.06	8.89	11.97	10.75	9.67	8.42	9.45	8.34	10.67	9.46	9.75	8.69
1974	9.78	8.74	10.52	9.50	8.70	7.75	10.10	8.96	10.21	9.22	9.94	8.96

Table VI Monthly rainfall (mm), 1970 - 1974

(average over whole sugar cane area)

Crop year	GROWTH PERIOD (deficient months in italic characters)								MATURATION PERIOD (excess months in italic characters)			
	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.
Normals 1875 - 1949	96	180	280	281	307	241	176	126	117	105	74	71
Extremes to date	13 335	44 1138	68 825	66 915	85 990	37 701	41 544	25 419	41 260	15 318	18 205	9 250
1970	*30*	350	401	*188*	567	*102*	*109*	141	*124*	*123*	49	37
1971	*47*	*67*	*182*	296	*121*	273	195	*85*	112	79	22	42
1972	133	*74*	*213*	372	*193*	244	*161*	230	*153*	*246*	26	*155*
1973	261	*134*	283	318	324	*116*	*141*	160	113	*135*	59	30
1974	*14*	*92*	*213*	*212*	*256*	*73*	*110*	*107*	116	*154*	62	22

Table VII. Monthly air temperatures (°C), 1970 - 1974

(mean maximum & minimum recorded at Plaisance Airport)

YEAR	NOV.		DEC.		JAN.		FEB.		MAR.		APR.		MAY		JUNE		JULY		AUG.		SEPT.		OCT.	
	M	m	M	m	M	m	M	m	M	m	M	m	M	m	M	m	M	m	M	m	M	m	M	m
Normals 1950 - 73	27.5	19.6	28.8	21.4	29.3	22.5	29.3	22.6	28.9	22.4	27.9	21.1	26.3	19.5	24.8	17.9	23.9	17.6	23.7	17.2	24.6	17.5	25.7	18.3
1970	29.0	21.2	29.5	22.4	29.9	23.6	30.3	23.8	29.2	23.3	27.8	21.4	26.0	20.1	24.7	18.8	23.9	18.2	23.6	17.5	24.7	18.6	26.4	18.2
1971	27.3	20.3	29.0	21.3	30.3	22.7	28.8	22.7	28.7	21.5	28.0	22.1	26.7	19.7	24.6	18.1	24.0	18.4	23.6	16.8	24.6	17.1	25.4	18.7
1972	27.8	18.7	29.3	20.8	29.9	22.5	28.9	22.2	28.6	22.0	28.1	21.1	26.9	19.9	25.8	17.9	24.9	18.0	24.7	17.7	25.6	17.6	26.1	19.4
1973	26.8	20.2	28.8	22.7	29.4	23.3	29.4	23.3	29.5	23.1	28.0	21.7	27.2	20.4	24.5	18.1	24.2	18.3	23.5	17.8	24.5	17.2	26.1	18.6
1974	28.6	19.7	29.6	21.0	29.3	22.0	28.3	22.0	28.3	21.8	27.8	20.7	26.3	18.3	24.6	16.7	23.7	17.2	23.7	17.3	24.1	16.3	26.1	18.5

Table VIII. Highest sustained wind speed during one hour in km

(average over Mauritius)

Crop Year	1960	1970	1971	1972	1973	1974
November	31	26	29	27	**56**	26
December	24	24	34	27	31	25
January	**85**	43	32	29	36	30
February	**119**	**52**	43	**60**	30	28
March	24	**72**	26	45	34	31
April	24	32	26	29	28	29
May	27	31	27	32	22	25

NOTE : Cyclonic winds over 50 km/hr during one hour indicated in bold characters

Table IX. Highest sustained wind speed during one hour in km, cyclone years

Cyclone Years		West	North	East	South	Centre
January	1960 *Alix*	97	77	69	97	—
February	1960 *Carol*	134	132	126	119	89
December	1961 *Beryl*	79	72	53	82	64
February	1962 *Jenny*	103	119	79	93	87
January	1964 *Danielle*	77	98	89	130	85
February	1964 *Gisèle*	60	53	42	68	52
January	1966 *Denise*	85	84	56	71	64
January	1967 *Gilberte*	53	61	66	72	60
February	1968 *Ida*	53	48	32	40	45
March	1968 *Monica*	39	27	50	50	32
February	1970 *Jane*	56	56	43	58	48
March	1970 *Louise*	63	74	84	77	61
February	1972 *Eugénie*	61	63	43	80	56
November	1972 *Ariane*	48	64	63	54	48

Table X. Cane Varieties, 1967 - 1974

(% *area cultivated on estate lands*)

	B 37172 (1953)	Ebène 1/37 (1951)	Ebène 50/47 (1962)	M 134/32 (1937)	M 147/44 (1955)	M 31/45 (1955)	M 202/46 (1959)	M 93/48 (1959)	M 253/48 (1961)	M 442/51 (1964)	M 99/48 (1965)	M 409/51 (1966)	M 13/53 (1966)	M 13/56 (1966)	M 377/56 (1966)	M 351/57 (1970)	S 17 (1970)	M 124/59 (1971)	M 438/59 (1971)
1967	6	6	6	2	23	5	14	17	2	7	1	—	—	—	—	—	—	—	—
1968	5	4	5	2	19	6	14	19	2	9	1	1	1	3	1	—	—	—	—
1969	3	2	4	1	15	6	15	21	2	10	1	1	1	6	3	—	—	—	—
1970	2	1	3	1	12	6	12	21	2	10	1	1	1	8	8	2	4	—	—
1971	1	1	2	1	7	6	11	20	1	10	1	1	1	11	8	4	10	—	—
1972	1	—	1	—	3	5	10	18	1	9	1	1	1	15	9	4	16	1	—
1973	—	—	—	—	1	5	7	16	1	8	1	1	1	18	9	4	23	2	1
1974	—	—	—	—	—	4	5	13	—	6	—	1	1	21	10	5	28	2	2

NOTE : Year of approval by Cane Release Committee in brackets

Table XI. Cane varieties on miller-planters' land 1970-1974

(% *annual plantation*)

Year / Varieties	Island					West					North					East					South					Centre				
	1970	1971	1972	1973	1974	1970	1971	1972	1973	1974	1970	1971	1972	1973	1974	1970	1971	1972	1973	1974	1970	1971	1972	1973	1974	1970	1971	1972	1973	1974
M 31/45	2.0	2.0	1.6	0.7	2.2	0.3	0.8	—	—	—	0.5	1.8	—	—	—	7.2	5.2	5.2	2.8	7.9	0.4	0.8	0.1	0.4	1.6	0.3	0.4	2.0	—	—
M 202/46 ...	0.9	0.7	0.1	—	—	—	—	—	—	—	—	—	—	—	—	0.2	—	—	—	—	2.1	1.8	0.3	—	—	—	—	—	—	—
M 93/48 ...	12.3	9.9	8.8	3.9	6.8	—	—	—	—	—	—	—	—	—	—	3.9	2.7	1.6	—	2.2	13.2	11.5	7.5	3.0	3.3	41.4	40.7	36.1	19.9	33.9
M 442/51 ...	0.4	0.5	0.4	0.9	—	—	—	—	—	—	0.4	1.0	0.9	0.8	—	0.4	0.5	—	—	—	0.8	0.5	0.6	—	—	0.1	—	—	—	—
M 13/56 ...	16.6	25.8	25.1	23.3	24.6	13.4	19.1	17.5	14.6	13.5	30.5	56.9	63.3	44.9	35.6	17.0	19.1	13.7	21.4	24.1	16.1	24.6	25.6	22.9	30.5	3.8	—	1.1	—	—
M 377/56 ...	20.7	—	3.0	2.0	19.7	8.1	—	18.0	10.0	43.5	39.2	—	2.7	2.0	36.1	17.0	—	5.4	1.5	20.8	19.1	—	—	0.5	10.9	15.9	—	—	2.9	9.7
M 351/57 ...	6.4	8.7	3.4	1.7	1.7	4.8	2.0	7.8	2.2	6.0	1.4	2.2	1.2	2.7	3.0	2.5	6.2	0.6	0.2	0.2	10.3	10.3	3.8	1.2	0.5	8.2	23.3	6.9	3.3	4.1
N Co 376 ...	0.4	0.1	0.2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.9	0.3	0.5	—	—	—	—	—	—	—
S 17 ...	37.3	48.2	47.0	50.1	36.0	69.8	67.1	50.8	49.9	35.3	25.2	37.2	26.9	37.3	19.1	49.5	61.7	54.6	54.3	41.3	33.9	47.0	54.9	58.1	40.4	27.0	29.8	38.6	44.8	39.3
M 124/59 ...	—	1.7	5.4	8.2	3.0	—	2.7	—	9.5	0.1	—	—	—	0.6	1.5	—	1.0	9.5	3.8	0.5	—	1.9	4.5	9.5	3.7	—	0.4	10.0	22.4	7.8
M 438/59 ...	—	—	2.7	7.6	2.2	—	—	—	9.6	0.4	—	—	2.4	10.5	2.7	—	—	7.7	15.2	1.1	—	—	0.4	2.6	2.3	—	—	2.6	5.5	3.3
Other varieties	3.0	2.4	2.3	1.6	3.8	3.6	8.3	5.9	4.2	1.2	1.9	0.9	2.6	1.2	2.0	2.3	3.6	1.7	0.8	1.9	3.2	1.3	1.8	1.8	6.8	3.3	5.4	2.7	1.2	1.9
Total area planted (ha.)	6,018	6,317	6,139	5,678	5,263	374	521	458	435	310	965	1,143	1,070	1,214	1,028	1,399	1,445	1,369	1,121	1,117	2,385	2,466	2,279	2,095	2,020	895	742	963	813	788

Table XII. Area harvested and yields, 1974 crop

A = area, ha

B = yields, tonn s/ha

	Island		West		North		East		South		Centre	
	A	B	A	B	A	B	A	B	A	B	A	B
1. Miller-planters												
(a) Virgin cane												
(i) Grande Saison	3,843	100.0	284	110.0	915	99.3	824	97.7	1,169	101.2	651	97.2
(ii) Petite Saison	1,473	88.9	94	93.8	146	84.6	492	96.7	685	83.2	56	93.5
1st Ratoon	6,202	91.6	433	93.5	1,158	97.2	1,407	95.4	2,279	88.0	925	87.1
2nd ,,	6,306	88.8	425	85.3	1,173	91.7	1,501	90.8	2,470	87.3	737	87.6
3rd ,,	6,114	88.0	388	86.4	983	87.4	1,464	91.1	2,373	86.2	906	89.2
4th ,,	5,960	88.9	339	87.9	1,072	90.0	1,447	92.8	2,234	86.5	868	90.4
5th ,,	5,360	84.4	266	79.0	1,045	82.2	1,241	90.6	2,057	81.7	751	86.7
6th ,,	3,411	81.2	205	79.0	704	78.9	789	87.7	1,332	76.8	381	88.6
Older ratoonss	5,235	81.0	582	83.8	681	77.3	1,258	91.0	2,113	75.6	601	80.8
Total Miller-Planters	43,904	87.9	3,016	88.2	7,877	88.9	10,423	92.4	16,712	84.6	5,876	88.6
Total Owner-Planters	33,573	59.0	2,263	57.1	13,036	53.3	8,153	62.0	5,923	64.0	4,198	65.6
Total Tenant-Planters	2,404	48.6	—	—	10	43.3	1,080	45.5	1,210	51.7	104	46.7
Grand Total	79,881	74.7	5,279	74.9	20,923	66.6	19,656	77.3	23,845	78.0	10,178	78.7

Table XIII. Evolution of Cane Quality 1974 Crop
(*Sucrose % Cane*)

Week ending	Island	West	North	East	South	Centre
13th July	12.44	—	13.13	12.67	12.31	11.74
20th ,,	12.53	13.86	12.60	12.58	12.39	11·92
27th ,,	12.77	13.77	12.70	12.81	12.83	12.25
3rd August	13.06	14.40	12.83	13.22	13.05	12.50
10th ,,	12.95	14.13	12.79	12.94	13.03	12.46
17th ,,	12.97	14.34	12.68	12.97	13.05	12.66
24th ,,	12.83	14.21	12.62	12.80	12.87	12.33
31st ,,	13.07	14.02	12.79	13.14	13.19	12.64
7th September	13.05	13.95	12.85	13.02	13.17	12.82
14th ,,	13.16	13.80	12.88	13.18	13.33	12.91
21st ,,	13.19	13.92	12.92	13.21	13.32	13.01
28th ,,	13.33	14.10	13.04	13.44	13.39	13.12
5th October	13.41	14.13	13.23	13.53	13.45	13.11
12th ,,	13.49	14.15	13.42	13.61	13.46	13.14
19th ,,	13.69	14.25	13.72	13.73	13.59	13.46
26th ,,	13.85	14.50	13.99	13.87	13.62	13.64
2nd November	14.89	14.23	14.15	13.84	13.75	13.55
9th ,,	14.07	14.24	14.38	14.11	13.84	13.77
16th ,,	14.27	14.58	14.44	14.22	14.15	13.96
23rd ,,	14.24	14.83	14.54	14.12	14.03	14.11
30th ,,	14.22	15.34	14.36	14.04	14.08	13.99
7th December	14.15	14.97	14.38	14.05	13.94	14.49
14th ,,	13.26	14.23	13.24	13.24	13.26	12.80

Table XIV. Comparative mid-harvest dates 1970 - 1974

A = Mid-harvest date weighed by weekly tonnages of cane crushed
B = Interval between mid-harvest dates (days)

Crop Year	Island		West		North		East		South		Centre	
	A	B	A	B	A	B	A	B	A	B	A	B
1970	13/9	359	20/9	360	19/9	365	9/9	360	16/9	364	28/8	339
1971	22/9	374	29/9	374	28/9	374	14/9	370	25/9	374	19/9	387
1972	23/9	367	23/9	360	26/9	364	26/9	378	21/9	362	16/9	363
1973	15/9	357	13/9	355	19/9	358	11/9	350	15/9	359	12/9	351
1974	16/9	366	22/9	374	17/9	363	15/9	369	21/9	371	11/9	364

Table XV. Summary of chemical control data 1974

(i) CANE CRUSHED AND SUGAR PRODUCED

		Médine	Solitude	Beau Plan	The Mount	Belle Vue	St. Antoine	Mon Loisir	Constance	Union Flacq	Beau Champ	Riche en Eau	Mon Trésor	Savannah	Rose Belle	Britannia	Union St. Aubin	St. Félix	Bel Ombre	Réunion	Highlands	Mon Désert Alma	Totals & Averages
CRUSHING PERIOD	From	13/7	11/7	19/7	6/7	5/7	28/6	18/7	5/7	7/6	1/7	2/7	29/6	28/6	21/6	26/6	2/7	9/7	8/7	5/7	29/6	24/6	—
	To	3/12	16/11	23/11	11/12	22/11	31/10	10/12	5/12	13/12	20/12	20/12	13/12	16/12	27/11	14/12	16/12	2/12	14/12	6/12	16/11	23/11	—
	No. of crushing days	114	103	101	126	113	97	117	123	154	140	138	135	138	126	139	134	117	126	124	113	123	126
	Net crushing hours per day	20.85	22.22	23.54	21 11	20.17	19.41	20.43	19.64	21.27	21.37	18.47	16.83	19.27	19.75	20.04	19.58	20.98	19.42	19.14	19.30	20.51	20.22
	Hours stoppages per day	0.95	0.45	0.44	0.71	1.01	1.03	1.88	0.40	1.31	0.60	0 51	0.20	0.27	1.24	0.66	1.57	0.97	0.86	0.88	0.31	0.33	0.79
	Overall time efficiency	86.9	92.6	95.9	88.0	84.0	80.9	85.1	81.8	88.6	89.0	77.0	70.1	80.3	82.3	83.5	81.6	87.4	80.9	79.8	90.9	85.5	84.3
	Mechanical time efficiency	95.5	98.0	98.1	96.7	95.2	95.0	91.6	90.8	94.2	97.3	97.3	98.8	98.7	94 1	96.8	92.6	95.6	95.8	95.6	98.4	98.4	96.2
CANE CRUSHED (Tonnes)	Factory	265,978	55,689	73,026	158,878	138,458	99,308	176,415	141,330	506,072	315,289	240,171	202,555	208,800	170,399	157,657	284,272	56,984	94,632	153,315	133,985	233,529	3,866,742
	Planters	129,007	141,414	137,916	70,277	139,512	96,681	105,755	116,711	302,497	135,672	43,560	38,566	80,429	65,477	65,374	3,393	82,050	63,503	77,094	79,928	122,097	2,096,913
	Total	394,985	197,103	210,942	229,155	277,970	195,989	282,170	258,041	808,569	450,961	283,731	241,121	289,229	235,876	223,031	287,665	139,034	158,135	230,409	213,913	355,626	5,963,655
	Factory % total	67.3	28.3	34.6	69.3	49.8	50.6	62.5	54.8	62.6	69.9	84.6	84.0	72.1	72.2	70.6	98.8	41.0	59.8	66.5	62.6	65.7	64.8
	Per day	3,465	1,914	2,096	1,819	2,460	2,021	2,411	2,098	5,250	3,221	2,056	1,786	2,096	1,872	1,604	2,147	1,188	1,255	1,858	1,893	2,891	2,257
	Per hour actual crushing	166.2	86.1	89.0	86.2	122.0	104.1	118.0	106.8	247.0	150.7	111.3	106.1	108.8	94.8	80.1	109.6	56.6	64.6	97.1	98.1	141.0	111.6
PERCENTAGE VARIETIES CRUSHED (Factory)	S 17	35.3	22.0	17.8	15.2	32.2	21.3	10.6	38.9	34.3	29.6	27.7	16.0	25.9	17.8	20.3	42.8	26.9	54.2	23.6	32.0	14.1	27.5
	M 13/56	13.8	39.8	37.9	44.6	35.5	48.6	55.3	30.4	7.1	17.2	24.3	43.7	31.4	2.4	2.3	14.8	29.7	20.6	6.9	2.9	1.1	20.8
	M 93/48	0.1	—	0.5	6.1	—	—	0.6	0.9	15.3	8.1	0.7	5.5	10.6	30.3	34.8	13.8	6.6	—	30.5	39.9	64.3	14.2
	M 377/56	14.3	16.2	17.4	11.0	11.8	8.7	8.2	14.5	12.4	6.0	8.9	12.0	9.7	7.7	8.7	9.4	7.0	8.2	5.7	9.8	7.7	10.1
	M 442/51	7.0	3.4	11.4	8.9	11.9	13.4	20.6	3.2	2.0	4.8	6.0	6.2	3.1	0.1	0.1	3.4	4.4	7.5	1.1	—	—	5.0
	M 202/46	12.8	6.9	4.3	3.4	1.9	2.3	0.5	0.8	0.4	9.5	2.7	6.3	6.9	21.2	5.0	2.3	0.5	3.3	3.6	0.2	—	4.7
	M 351/57	3.9	3.0	0.1	4.2	—	0.1	—	0.3	4.5	2.1	13.6	2.2	3.4	9.3	7.7	3.4	7.6	0.4	9.8	1.7	6.0	4.3
	M 31/45	0.1	—	1.5	0.5	0.1	0.1	1.0	4.6	11.9	13.8	2.8	1.2	2.8	2.9	5.4	3.4	5.7	1.2	3.9	—	—	4.2
	M 124/59	1.3	—	0.1	—	—	0.5	0.1	0.1	2.2	2.3	3.0	0.6	1.6	4.7	3.1	1.0	2.1	0.6	5.1	4.7	5.6	2.0
	M 438/59	1.4	0.1	1.4	2.1	5.3	1.6	0.6	3.9	4.2	1.2	0.4	0.3	0.4	0.2	0.7	0.4	1.6	1.3	0.8	1.9	0.9	1.6
	Other varieties	9.5	8.6	7.6	4.0	1.3	2.4	2.5	2.4	5.7	5.4	9.9	6.0	4.2	3.4	11.9	5.3	7.9	2.7	9.0	6.9	0.3	5.6
SUGAR PRODUCED (Tonnes)	Raw sugar	50,057	22,158	25,707	26,973	19,864	12,848	32,558	30,674	76,760	40,469	32,503	29,142	35,636	27,254	26,421	33,813	15,577	18,471	25,133	25,161	40,574	647,753
	White sugar	—	—	—	—	13,171	8,059	—	—	15,265	12,368	—	—	—	—	—	—	—	—	—	—	—	48,863
	Total sugar	50,057	22,158	25,707	26,973	33,035	20,907	32,558	30,674	92,025	52,837	32,503	29,142	35,636	27,254	26,421	33,813	15,577	18,471	25,133	25,161	40,574	696,616
	Total sugar at 96° Pol	51,431	22,232	26,413	27,755	34,094	21,576	33,412	31,572	94,759	54,458	33,504	29,973	36,632	28,056	27,177	34,805	15,988	18,945	25,800	25,886	41,620	716,088

Table XV. Summary of chemical control data 1974

(ii) CANE, BAGASSE AND JUICES

		Médine	Solitude	Beau Plan	The Mount	Belle Vue	St. Antoine	Mon Loisir	Constance	Union Flacq	Beau Champ	Riche en Eau	Mon Trésor	Savannah	Rose Belle	Britannia	Union St. Aubin	St Félix	Bel Ombre	Réunion	Highlands	Mon Désert Alma	Totals & Averages
CANE/SUGAR RATIO	Tonnes cane per tonne sugar made	7.90	8.89	8.21	8.50	8.41	9.37	8.67	8.41	8.79	8.53	8.73	8.27	8.11	8.65	8.44	8.51	8.92	8.56	9.17	8.50	8.76	8.56
	Tonnes cane per tonne sugar made @ 96° Pol	7.68	8.70	7.99	8.25	8.15	9.08	8.45	7.92	8.53	8.28	8.47	8.04	7.90	8.41	8.21	8.27	8.70	8.35	8.93	8.26	8.54	8.32
	Sucrose per cent	14.23	12.93	13.43	13.04	13.58	12.99	13.29	13.45	12.99	13.56	12.91	13.78	13.79	12.93	13.12	13.11	12.88	13.31	12.67	12.91	12.79	13.25
	Fibre per cent	12.34	14.81	14.14	13.71	14.23	14.15	13.21	13.66	12.50	12.74	12.07	12.55	12.68	12.58	11.57	10 75	12.84	13.47	12.97	11.61	12.02	12.77
BAGASSE	Pol per cent	1.97	1.90	1.54	1.53	2.06	2.17	1.96	1.79	2.07	2.07	1.96	2.27	2.21	2.09	2.45	1.84	2.12	2.24	2.14	1.42	1.87	1.99
	Moisture per cent	51.4	47.3	45.2	47.0	47.3	52.2	49.6	47.2	50.1	47.8	50.3	49.6	49.9	49.8	48.6	47.4	48.5	49.6	50.8	49.9	49.1	49.1
	Fibre per cent	45.8	50.1	52.8	50.9	50.1	45.0	47.8	50.2	47.2	49.4	47.0	47.5	47.2	47.5	48.4	49.9	48.7	47.5	46.4	48.2	48.5	48.2
	Weight per cent cane	26.90	29.58	26.80	26.96	28.40	31.45	27.68	27.19	26.50	25.77	25.69	26.42	26.89	26.50	23.93	21.50	26.37	28.30	28.00	24.11	24.78	26.49
FIRST EXPRESSED JUICE	Brix (BI)*	19.71	19.19	19.47	18.46	19.78	18.73	19.37	19.23	18.03	19.06	18.35	18.86	19.12	17.79	18.07	18.37	17.75	19.00	17.72	17.44	17.32	18.61
	Gravity purity	88.4	87.0	88.9	89.3	89.3	88.0	87.7	87.9	89.4	89.0	87.6	89.9	90.4	89.4	91.4	88.9	87.5	90.1	89.3	89.5	89.7	89.0
	Reducing sugars/sucrose ratio	3.1	3.8	3.9	3.4	2.4	3.6	3.3	4.7	4.3	3.8	3.8	2.9	2.7	3.9	3.7	3.4	3.7	2.8	3.4	3.1	4.1	3.5
LAST EXPRESSED JUICE	Brix*	1.55	3·25	2.98	2.72	4.97	3.14	2.46	2.36	4.29	2.78	2.97	2.58	3.12	3.01	3.04	2.36	3.01	3.22	2.69	1.80	2.34	2.89
	Apparent purity	69.7	72.6	75.5	72.1	79.1	77.1	71.9	68.7	77 4	74 1	72.7	79.3	75.3	76.7	80.6	71.2	74.1	78.6	75.1	71.7	79.1	74.9
MIXED JUICE	Weight per cent on cane	102.7	97.8	104.1	101.3	95·4	103.9	98.3	105.5	91.9	99.1	109.3	102.3	103.1	105.4	104.1	106.4	105.2	102.0	99.3	103.0	101.2	100.9
	Brix*	15.24	14.84	14.30	14.37	15.56	13.67	15.03	14.34	15.40	15.08	13.29	14.58	14.49	13.30	13.42	13.66	13.65	13.65	13.87	13.87	13.77	14.43
	Gravity purity	87.5	85.2	87.4	86.7	87.5	86.7	86.3	85.7	87.9	87.2	85.4	88.4	88.3	88.3	89.7	87.5	85.9	87.7	88.0	88.0	88.4	87.4
	Reducing sugars/sucrose ratio	3.4	4.9	4.9	4.2	3.5	4.1	4.9	5.2	5.2	4.6	4.7	3.4	3.4	4.4	4.3	4.3	4.9	3.3	3.7	3.4	4.4	4.3
	Gty. Pty drop from first expressed juice	1.0	1·8	1.5	2.6	1.8	1.3	1.4	2.2	1.5	1.8	2.2	1·5	2.1	1.1	1.7	1.4	1.6	2.4	1.6	1.5	1.3	0.9
ABSOLUTE JUICE	Brix (Ba)	18.74	17.95	17.98	17.53	18.18	17.57	17.90	18.34	16.98	17.95	17.32	17.91	18.01	11.86	16.62	16.91	17.34	17.63	16.73	16.70	16.52	17.49
	Ba/BI	0.95	0.94	0.92	0.95	0.92	0.94	0,92	0.95	0.94	0.94	0.94	0.94	0.94	0.95	0.92	0.92	0.97	0.93	0.94	0.95	0.95	0.94
	Gravity purity	86.6	84.6	86.9	86.2	87.1	86.2	85.6	85.0	87.4	86.6	84.8	88.0	87.7	87.7	89.2	86.8	85.3	87.2	87.0	87.5	88.0	86.8
CLARIFIED JUICE	Brix*	15.11	14.47	13.99	13.86	14.47	13.09	14.69	14.35	15.66	14.79	13.39	14.09	13.98	12.73	12.93	13.57	13.30	13.80	13.99	13.08	13.85	13.98
	Gravity purity	—	85.8	85.7	87.0	88.2	87.8	87.8	85.9	88.4	87.7	87.2	88.6	89.3	—	89.9	—	85.9	88.1	88.1	88.2	89.2	87.8
	Reducing sugars/sucrose ratio	3.6	4.4	4.7	4.1	3.1	3.8	—	5.1	5·1	4.2	4.2	3.2	3.3	3.9	4.0	—	4.7	3.3	3.6	3.4	4.3	4.0

* Refractometric Brix

Table XV. Summary of chemical control data 1974

(iii) FILTER CAKE, SYRUP, pH, FINAL MOLASSES, SUGAR

		Medine	Solitude	Beau Plan	The Mount	Belle Vue	St Antoine	Mon Loisir	Constance	Union Flacq	Beau Champ	Riche en Eau	Mon Trésor	Savannah	Rose Belle	Britannia	Union St Aubin	St. Félix	Bel Ombre	Réunion	Highlands	Mon Désert Alma	Totals & Averages
FILTER CAKE	Pol per cent	0.95	0.95	1.13	1.84	0.81	0.72	1.04	0.73	0.61	1 91	0.74	1.63	0.71	1.16	1 71	1 13	7.17	4.04	8.52	2.41	2.72	1.61
	Weight per cent cane	4.66	2.34	4.74	3 40	2.70	2.20	3.03	3.55	3.17	3.77	4.92	2.75	2.59	2.69	3.66	2.74	1.77	3.31	2.12	3.04	5.11	3.37
SYRUP	Brix*	63.4	64.2	61.6	63.1	61.9	64.5	61.5	65.3	65.2	62.2	64.6	61.7	60.8	69.6	59.3	57.8	59.2	54.5	60.4	60.9	60.0	62.0
	Gravity purity	–	86.2	87.3	87.3	83.2	87.6	—	86.0	88.0	87.5	87.2	89.0	89.5	—	90.0	—	86.1	87.6	87.9	88.2	88.5	87.8
	Reducing sugars/sucrose ratio	4.2	3 4	4.6	4.4	3.6	4.2	—	5.3	4.9	4.3	4.2	3.4	2.5	3.9	4.1	—	3.9	1.5	3.9	3.4	4.4	3.9
pH VALUES	Limed juice	8.0	8.1	8.4	7.6	8.1	—	—	8.0	8.3	—	8.2	—	7 7	7.9	8.1	—	7.5	7.8	8.5	8.1	8.0	8.0
	Clarified juice	7 1	7 1	7.2	7.0	7.2	7.1	7.0	7.3	7.4	7.3	7 1	7.3	7.0	7.0	7 1	7.1	7.0	7.0	7.6	7.3	7.0	7.2
	Filter press juice	—	-	9.4	—	6.6	—	7.2	7.0	8.8	7.0	8 4	7.2	7.4	7.3	—	6.4	7.0	—	6.7	6.8	8.3	7.4
	Syrup	6.3	-	7 1	6.6	6.6	6.4	6.6	6.6	6.9	6.7	6 4	6.9	6 8	6.5	7.1	6.4	—	6.6	7.2	6.9	6.9	6.7
FINAL MOLASSES	Brix**	86.2	83.7	85.2	83.1	83.0	84.9	82.3	81.5	83.7	82.9	85.5	85.6	83.8	86.3	84.7	88.5	86.5	81 7	90.9	85.1	84.9	84.6
	Sucrose per cent	31.53	31.29	29.07	28.87	29.57	34.60	31.11	28.82	30.20	33 40	30.85	32.86	31.67	30.73	31 74	33.85	32.20	30.62	36.30	30.63	31.45	31.39
	Reducing sugars per cent	16.71	12.79	16.96	15.51	14.00	13.15	20.56	17.12	19.50	16.40	15.04	14.86	14.18	17.90	16.63	15.95	18.00	12.72	14.37	14.56	17.31	15.82
	Total sugars per cent	48.24	44.08	46.03	44.38	43.57	47.75	51.67	45.92	49.70	49.80	45.89	47 72	45.85	48.63	48.37	49.80	50.20	43.34	50.66	45.19	48.76	47.21
	Gravity purity	36.6	37.4	34.1	34.7	35.6	40.7	36.5	35.4	36.1	40.3	36.1	38.4	37.8	35.6	37.5	38.3	37.2	37,5	39.9	36.0	37.0	37.1
	Reducing sugars/sucrose ratio	53.0	40.9	58.3	53.7	47.4	38.0	66.1	59.4	64.6	49.1	48.8	45.2	44.8	58.3	52.4	47.1	55.9	41.5	39.6	47.6	55.0	50.4
	Weight per cent cane at 85° Brix	2.88	3.47	3 19	3.02	3.36	3.67	3.68	3.21	2.89	3.30	2.80	2.77	2.67	2.35	2.29	2.66	3.04	2.82	2.82	2.62	2.40	2.94
SUGAR MADE	White sugar recovered per cent cane	—	—	—	—	4.74	4.11	—	—	1.89	2.74	—	—	—	—	—	—	—	—	—	—	—	0.82
	Raw sugar recovered per cent cane	12.67	11.26	12.19	11.77	7.14	6.56	11.54	11.89	9.49	8.97	11.46	12.09	12.32	11.55	11.85	11.75	11.20	11.68	10.91	11.76	11.41	10.86
	Total sugar recovered per cent cane	12.67	11.26	12.19	11.77	11.88	10.67	11.54	11.89	11.38	11.72	11.46	12.09	12.32	11.55	11.85	11.75	11.20	11.68	10.91	11.76	11.41	11.68
	Average pol of sugars	98.64	98.15	98.64	98.78	99.08	99.07	98.52	98.81	98.85	98.95	98.96	98.74	98.68	98.83	98.74	98.82	98.53	98.46	98.55	98.77	98.47	98.74
	Total sucrose recovered % cane	12.50	11.03	12.02	11.63	11 78	10.57	11.37	11 75	11.25	11.58	11.34	11.93	12.16	11.42	11 70	11.62	11.04	11.50	10.75	11.62	11.24	11.53
	Moisture per cent raw sugar	0.34	0.45	0.36	0.37	0.40	0.35	0.42	0.35	0.36	0.44	0.35	0.31	0.34	0.42	0.36	0.32	0.48	0.35	0.39	0.28	0.35	0.37
	Dilution indicator of raw sugar	33.6	32.4	35.4	43.3	43.2	35.2	39.4	41 1	37.3	50.1	51.3	32.7	34.9	55.1	39.0	37.8	47.9	29.2	36.1	28.7	29.6	41.1

* Refractometric Brix 1 : 5 *w/w*

** Refractometric Brix 1 : 6 *w/w*

Table XV. Summary of chemical control data 1974

(iv) MASSECUITES

		Médine	Solitude	Beau Plan	The Mount	Belle Vue	St. Antoine	Mon Loisir	Constance	Union Flacq	Beau Champ	Riche en Eau	Mon Trésor	Savannah	Rose Belle	Britannia	Union St Aubin	St. Félix	Bel Ombre	Réunion	Highlands	Mon Désert Alma	Totals & Averages
MAGMA	Apparent purity	84.4	—	87.9	85.3	85.7	84.7	82.8	82.2	84.0	83.1	83.1	85.9	89.7	85.1	85.3	85.1	84.1	86.4	85.6	86.1	83.8	85.0
A-MASSECUITE	Brix**	92.1	91.5	90.8	92.4	91.2	89.9	92.5	93.0	93.0	92.1	92.5	92.5	92.1	93.5	92.6	93.3	90.9	91.1	91.4	92.5	91.9	92.2
	Apparent purity	82.3	81.4	85.1	84.3	87.5	85.0	78.9	79.4	81.2	84.0	83.4	83.9	80.1	84.6	84.3	80.2	81.2	84.3	81.0	82.1	79.7	82.4
	Apparent purity of A molasses	63.9	58.4	66.4	60.5	71.0	72.4	54.5	54.9	57.3	61.8	63.8	59.4	58.8	55.0	57.5	54.7	58.8	65.7	61.2	57.1	60.9	60.4
	Drop in purity	18.4	23.0	18.7	23.8	16.5	12.6	24.4	24.5	23.9	22.2	19.6	24.5	21.3	29.6	26.8	25.5	22.4	18.6	19.8	25.0	18.8	22.0
	Crystal per cent Brix in massecuite	51.0	55.3	55.7	60.3	56.9	45.7	53.6	54.3	56.0	58.1	54.1	60.3	51.7	65.8	63.1	56.2	54.4	54.2	51.0	58.3	48.1	55.6
	Litres per tonne Brix in mixed juice	828	1,028	798	980	805	1,118	—	942	953	1,120	855	914	1,314	934	1,102	1,217	1,074	857	829	1,128	1,115	995
	A-Massecuite per cent total massecuite	64.6	73.9	58.7	78.8	54.1	59.5	—	80.0	71.8	70.9	67.0	68.1	85.0	82.1	80.3	81.0	78.5	61.7	70.1	82.9	74.7	71.8
B-MASSECUITE	Brix**	91.5	—	90.6	—	92.5	91.4	—	—	93.0	92.4	93.1	93.3	—	—	—	—	—	92.0	91.7	—	92.2	92.1
	Apparent purity	71.8	—	74.4	—	77.3	76.5	—	—	74.9	76.4	77.0	76.0	—	—	—	—	—	75.7	75.5	—	72.8	75.2
	Apparent purity of B molasses	53.9	—	51.3	—	55.6	57.9	—	—	53.6	55.2	57.4	48.0	—	—	—	—	—	54.0	54.0	—	55.2	54.5
	Drop in purity	17.9	—	23.1	—	21.7	18.5	—	—	21.3	21.2	19.6	28.0	—	—	—	—	—	21.7	21.5	—	17.6	20.7
	Crystal per cent Brix in massecuite	38.8	—	47.4	—	48.9	43.9	—	—	45.9	47.3	46.0	53.8	—	—	—	—	—	47.2	46.7	—	39.3	45.5
	Litres per tonne Brix in mixed juice	277	—	322	—	403	453	—	—	156	431	181	155	—	—	—	—	—	272	130	—	156	194
	B massecuite per cent total massecuite	21.6	—	23.7	—	27.1	24.1	—	—	11.8	11.1	14.2	11.6	—	—	—	—	—	19.6	11.0	—	10.4	10.3
	Kg sugar per cubic metre of A & B massecuites	732	753	738	825	531	478	—	835	725	605	761	748	627	883	769	665	726	716	826	730	644	707
C-MASSECUITE	Brix**	95.2	96.0	93.6	95.5	95.6	94.9	94.1	95.0	93.8	94.6	96.5	95.0	96.3	93.6	94.6	94.0	93.6	94.8	94.3	94.9	97.0	95.1
	Apparent purity	56.3	58.9	57.8	60.5	59.0	60.4	60.2	57.6	57.3	59.1	60.0	60.5	61.2	56.9	63.4	60.4	61.0	59.0	60.0	59.2	59.1	60.8
	Apparent purity of final molasses	32.5	37.4	28.4	32.5	35.6	39.2	35.8	30.9	29.7	37.2	31.5	32.5	36.6	29.6	31.9	32.2	31.2	34.6	39.9	31.6	32.0	33.4
	Drop in purity	23.8	21.5	29.4	28.0	23.4	21.2	24.4	26.7	27.6	21.9	28.5	28.0	26.6	27.3	31.5	28.2	29.8	24.4	20.1	27.6	27.1	27.4
	Crystal per cent Brix in massecuite	35.3	34.3	41.1	41.5	36.3	34.9	38.0	38.6	39.3	34.9	41.6	41.5	40.7	38.8	46.3	41.6	43.3	37.3	33.4	40.4	39.9	41.1
	Litres per tonne Brix in mixed juice	177	362	239	264	279	307	328	236	218	284	240	272	232	203	271	285	294	260	223	235	222	252
	C-massecuite per cent total massecuite	13.8	26.1	17.6	21.2	18.8	16.4	—	20.0	16.4	18.0	18.8	20.3	15.0	17.9	19.7	19.0	21.5	18.7	18.9	17.2	14.9	17.9
TOTAL MASSECUITE	Litres per tonne Brix in mixed juice	1,283	1,390	1,359	1,244	1,487	1,878	—	1,178	1,327	1,580	1,275	1,341	1,547	1,138	1,373	1,501	1,366	1,389	1,182	1,363	1,493	1,384
	Litres per tonne sugar made	1,585	1,796	1,661	1,540	1,857	2,501	—	1,499	1,650	2.015	1,618	1,655	1,875	1,380	1,620	1,856	1,752	1,719	1,492	1,655	1,824	1,723

** Refractometric Brix 1 : 6 *w/w*

Table XV. Summary of chemical control data 1974

(v) MILLING WORK, SUCROSE LOSSES AND BALANCE, RECOVERIES.

		Médine	Solitude	Beau Plan	The Mount	Belle Vue	St. Antoine	Mon Loisir	Constance	Union Flacq	Beau Champ	Richelieu en Eau	Mon Trésor	Savannah	Rose Belle	Britannia	Union St. Aubin	St. Félix	Bel Ombre	Réunion	Highlands	Mon Désert Alma	Totals & Averages
MILLING WORK	Imbibition water % cane	29.7	27.4	30.9	28.2	23.8	35.4	26.0	32.7	18.4	24.9	35.0	28.7	30.0	31.9	28.1	27.9	31.5	30.3	27.2	27.1	26.0	27.4
	Imbibition water % fibre	240	185	219	206	167	250	197	239	147	195	290	228	237	253	243	260	245	225	210	233	216	214
	Extraction ratio	30.2	29.4	21.7	23.2	30.3	37.2	30.8	26.5	33.6	30.8	32.1	34.7	34.3	33.9	38.6	28.1	33.9	35.4	36.3	22.8	30.2	31.3
	Mill extraction	96.3	95.7	96.9	96.8	95.7	94.7	95.9	96.4	95.8	96.1	96.1	95.7	95.7	95.7	95.5	97.0	95.7	95.2	95.3	97.4	96.3	96.0
	Reduced mill extraction	96.2	96.4	97.3	97.1	96.3	95.4	96.2	96.7	95.8	96.2	96.0	95.7	95.7	95.8	95.1	96.4	95.8	95.6	95.5	97.1	96.2	96.1
SUCROSE LOSSES	Sucrose lost in bagasse % cane	0.53	0.56	0.58	0.41	0.58	0.68	0.54	0.49	0.55	0.53	0.50	0,60	0.60	0.55	0.59	0.40	0.56	0,64	0.60	0.34	0.46	0.53
	,, ,, filter cake % cane	0.04	0.02	0.05	0.06	0.02	0.02	0.03	0.03	0.02	0.07	0.04	0.04	0.02	0.03	0.06	0.03	0.13	0.13	0.18	0.07	0.14	0.05
	,, ,, molasse % cane	0.90	1.14	0.92	0.89	1.02	1.27	1.14	0.96	0.88	1.13	0.86	0.90	0.86	0.71	0.73	0.86	0.97	0.90	0.96	0.80	0.76	0.93
	Undertemined losses % cane	0.26	0.16	0.03	0.05	0.18	0.47	0.21	0.23	0.29	0.24	0.17	0.31	0.15	0.21	0.04	0.20	0.18	0.14	0.19	0.08	0.20	0.20
	Industrial losses % cane	1.20	1.32	1.00	1.00	1.22	1.74	1.38	1.22	1.19	1.44	1.07	1.25	1.03	0.95	0.83	1.09	1.28	1.17	1.33	0.95	1.09	1.18
	Total losses % cane	1.73	1.88	1.41	1.41	1.80	2.42	1.92	1.71	1.74	1.97	1.57	1.85	1.63	1.50	1.42	1.49	1·84	1.81	1.93	1.29	1.56	1.71
SUCROSE BALANCE	Sucrose in bagasse % sucrose in cane	3.72	4.35	3.07	3.14	4.31	5.26	4.07	3.62	4.21	3.93	3.87	4.35	4.32	4.27	4.46	3.02	4.35	4.77	4.71	2.65	3.63	3.99
	,, ,, filter cake % sucrose in cane	0.28	0.17	0.40	0.46	0.16	0.12	0.24	0.19	0.15	0.53	0.31	0.32	0.13	0.24	0.48	0.24	1.01	1.01	1.42	0.57	1.09	0.41
	,, ,, molasses % sucrose in cane	6.33	8.53	6.88	6.83	7.50	9.76	8.61	7.17	6.82	8.34	6.66	6.56	6.22	5.49	5.57	6.59	7.53	6.74	7.55	6.28	5.91	6.99
	Undetermined losses % sucrose in cane	1.83	1.60	0.11	0.38	1.33	3.53	1.54	1.70	2.21	1.72	1.32	2.16	1.14	1.69	0.34	1.53	1.40	1.06	1.49	0.52	1.55	1.54
	Industrial losses % sucrose in cane	8.44	10.31	7.39	7.67	8.99	13.41	10.39	9.06	9.18	10.59	8.29	9.04	7.49	7.35	6.39	8.35	9.94	8.81	10.47	7.37	8.54	8.94
	Total losses % sucrose in cane	12.16	14.66	10.46	10.81	13.30	18.67	14.46	12.68	13.39	14.52	12.16	13.29	11.81	11.62	10.85	11.37	14.29	13.58	15.19	10.02	12.17	12.93
RECOVERIES	Boiling house recovery	91.3	89.3	92.4	92.1	90.6	85.8	89.2	90.6	90.4	89.0	91.4	90.5	92.2	92.3	93.3	91.4	89.6	90.8	89.0	92.4	91.1	90.7
	Reduced boiling house recovery (Pty. M.J. 85°)	89.2	98.2	90.7	90.9	88.4	83.7	88.0	90.0	87.7	86.6	91.1	87.3	89.6	89.8	89.7	89.3	88.8	88.4	85.9	90.2	88.1	88.6
	Overall recovery	87.9	85.4	89.5	89.2	86.7	81.3	85.5	87.3	86.6	85.5	87.8	86.6	88.2	88.4	89.2	88.6	85.7	86.4	84.8	90.0	87.8	87.1
	Reduced overall recovery (Pty. M..J. 85° F % C 12.5)	85.9	86.0	88.3	88.3	85.1	79.9	84.7	87.1	84.0	83.3	87.4	83.5	85.7	86.0	85.4	86.1	85.1	84.5	82.0	87.6	84.7	85.1
	Boiling house efficiency	98.9	99.1	99.3	99.7	98.0	95.5	97.6	99.0	97.4	98.2	100.7	98.0	99.7	99.2	99.6	99.8	96.4	98.4	97.4	99.6	98.0	98.6

APPENDIX

THE MAURITIUS HERBARIUM

Flora of the Mascarene Islands

Considerable progress was made in the preparation of the *Flora* and manuscripts of the following families were completed : Amaranthaceae, Campanulaceae, Capparidaceae, Chenopodiaceae, Commelinaceae, Dilleniaceae, Eriocaulaceae, Flacourtiaceae, Goodeniaceae, Hypoxidaceae, Juncaceae, Magnoliaceae, Menispermaceae, Plumbaginaceae, Portulacaceae, Ranunculaceae, Rutaceae, Smilacaceae and Taccaceae.

Progress was made in reviewing the draft sections on Agavaceae, Amaryllidaceae, Campanulaceae, Iridaceae and Liliaceae.

It is expected that the parts of the *Flora* dealing with several of these families, as well as the glossary and introductory volume, will go to press in 1975.

Scientific Missions

Mr. J. Bosser of the *Office de la Recherche Scientifique et Technique Outre Mer* (*O.R.S.T.O.M.*) made extensive surveys of the vegetation of Mauritius during his visit in April. Mr. M.J.E. Coode of the Royal Botanic Gardens, Kew, visited the island during the same month. They both visited Rodriguez with Messrs. F. Friedman of *O.R.S.T.O.M.* and J. Guého of the Mauritius Herbarium. The latter, during two months overseas leave, studied the specimens of Rhamnaceae from the Mascarenes at the Royal Botanic Gardens, Kew and at the *Muséum National d'Histoire Naturelle*, Paris.

Accessions

During the year, 629 specimens were added to the collections, as follows :

From Mauritius —	...	510
From Rodriguez	...	107
From Agalega ...	...	6
From Seychelles	...	6
TOTAL ...	...	629

Thanks are due to Mr. A. Cheeke of the British Ornithological Union for the donation of several specimens which he gathered at Rodriguez, Agalega and Seychelles. Amongst the most valuable acquisitions from Rodriguez were specimens of the endemics *Psiadia rodriguesiana* and *Pilea balfouri* both extremely rare species.

A species of *Asplenium* not represented in our collections was found growing at Piton du Fouge and material was collected for cultivation and for the herbarium collection.

A rare fern of the genus *Lamariopsis* was collected at Mt. Lagrave and will be sent to Prof. R.E. Holttum at the Royal Botanic Gardens, Kew, who is treating the genus for the *Flora*.

Field Work

The staff, with visiting research workers, was actively engaged in field studies on the *Flora*. Duplicates of the annotated material collected were distributed to the Institutions concerned.

Dr. L. Bernardi of the *Conservatoire et Jardin Botanique de Genève*, made collections of botanical specimens in December. He was accompanied by Mr. J.Y. Lesouef who collected seeds and cuttings of endangered native species for despatch to Conservatories overseas.

Visitors

During the month of December, Mr. J. Procter visited the island and made recommendations to the Government of Mauritius on nature conservation. He consulted the Herbarium collections and made field surveys of the vegetation and fauna in collaboration with the Herbarium staff. He was accompanied by Mr. R. Salm, who studied marine biology at several sites to seek an area suitable for setting up a marine park. The Herbarium's collections of reef building red algae proved useful to Mr. Salm during his studies.

Distribution and loan of specimens

Herbarium material belonging to forty-three families of Phanaerograms were despatched for study at the Kew and Paris Herbaria.

Flower buds of the endemic species *Psiloxylon mauritianum* were despatched to Prof. Rudolf Schmid of the University of California, Berkeley, U.S.A. for comparative and floral anatomy studies.

Seedlings of an indigenous species of *Dracaena* from the banks of Rivière Papayes, in the neighbourhood of Perrier Nature Reserve, were sent to the Royal Botanic Gardens, Kew, for cultivation.

Some two dozen mature seeds of an undescribed palm from Mauritius, the *Palmiste Bouclé*, were sent to Mr. De Armand-Hull, Florida, U.S.A., for cultivation.

Duplicate material of *Thelypteroid*, and other ferns, were presented to the Royal Botanic Gardens, Kew and the *Muséum National d'Histoire Naturelle*, Paris, as part of the current exchange programme.

Research

Taxonomic research carried out by the Herbarium staff during the year consisted of the following :

a) Further studies on the family Rhamnaceae, more specifically on the genera *Phylica* and *Gouania*, by J. Guého.

b) Completion of an account of the fern genus *Elaphoglossum*, for inclusion in the *Flora*, by D. Lorence. Four interspecific hybrids of *Elaphoglossum* have been found in Mauritius and one in Réunion.

c) Compilation of the results of a visit to Rodriguez, including a survey of the island's Pteridophytes.