
# 23rd ANNUAL REPORT 1975

# Mauritius Sugar Industry Research Institute

## ANNUAL REPORT 1975

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1976

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Mr. B.D. Roy, *representing the Ministry of Agriculture, Natural Resources and the Environment*

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Mr. G.M. Langlois
} *representing factory owners*

Mr. C. Rouillard, *representing large planters*

Mr. R. Ramsoondar
Mr. L. Tulloo
} *representing small planters*

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Mr. R. Brunet, *representing the Extension Service of the Ministry of Agriculture*

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Mr. J.M. Paturau, C.B.E., D.F.C.
Mr. J. Leclézio
} *representing the Société de Technologie Agricole et Sucrière*

and the Senior Staff of the Research Institute.

# STAFF

*(As at 31.12.75)*

**Director**

R. Antoine, C.B.E. 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**

| | |
|---|---|
| *Senior Scientific Officer* ... | J.A. Lalouette, Dip. Agr. (Maur.). *(Head of Division)* |
| *Scientific Officers* ... ... | P.R. Hermelin, Dip. Agr. (Maur.) |
| | L.C.Y. Lim Shin Chong, B.Sc. (Leicester), M.Sc. (Reading) |
| | Z. Peerun, B.Sc. (Wales) |
| *Scientific Assistants* ... ... | S. Duchenne |
| | Miss M. Ng Yan Luk |

**Plant Pathology**

| | |
|---|---|
| *Senior Scientific Officer* ... | C. Ricaud, B.Sc., Ph.D. (Lond.), D.I.C. *(Head of Division)* |
| *Scientific Officer* ... ... | S. Félix, Dip. Agr. (Maur.) |
| *Technical Officers* (II) ... ... | J.C. Autrey, B.Sc. (Lond.), M.Sc. (Exon.) |
| | P. Ferré |
| | S. Sullivan |
| *Scientific Assistant* ... ... | S. Dhayan |

**Entomology**

| | |
|---|---|
| *Senior Scientific Officer* ... | J.R. Williams, B.Sc., M.Sc., Ph.D. (Bristol), D.I.C., F.I. Biol. *(Head of Division)* |
| *Technical Officers* (I) ... ... | H. Dove, Dip. Agr. (Maur.) |
| | M.A. Rajabalee |

**Botany**

| | |
|---|---|
| *Senior Scientific Officer* ... | H.R. Julien, B.Sc., Ph.D. (Reading). *(Head of Division)* |
| *Scientific Officer* ... ... | G.C. Soopramanien, B.Sc., M.Sc. (Lond.), Dip. Agr. (Maur.) |

**Weed Agronomy**

| | |
|---|---|
| *Senior Scientific Officer* ... | G. Mc Intyre, B.Sc. (Lond.), M.I. Biol., Dip. Agr. (Maur.). *(Head of Division)* |
| *Scientific Assistants* ... ... | C. Barbe |
| | J. Pitchen |

**Sugar Cane Agronomy**

| | |
|---|---|
| *Senior Scientific Officer* ... | G. Rouillard, Dip. Agr. (Maur.). (*Head of Division*) |
| *Scientific Officer* ... ... | L. Thatcher, Dip. Agr. (Maur.) |
| *Technical Officers* (II) ... ... | A.P.F. Chan Wan Fong, Dip. Agr. (Maur.) |
| | J.R. Moutia, Dip. Agr. (Maur.) |

**Food Crop Agronomy**

| | |
|---|---|
| *Senior Scientific Officer* ... | J.R. Mamet, Dip. Agr. (Maur.) (*Head of Division*) |
| *Scientific Officer* ... ... | A.R. Pillay, B.Sc. (Q.U.B.), M.Sc. Agr., Ph.D. (Sydney), Dip. Agr. Micro (Sydney) |
| *Technical Officers* (II) ... ... | J.C. Carmagnole, Dip. Agr. (Maur.) |
| | H. Toohim |
| *Scientific Assistants* ... ... | G. Claite |
| | J.K. Wong Yen Chong |

**Soils and Plant Nutrition**

| | |
|---|---|
| *Senior Scientific Officer* ... | Y. Wong You Cheong, B.Sc., B. Agr., Ph.D. (Q.U.B.), C. Chem., F.R.I.C. (*Head of Division*) |
| *Scientific Officers* ... ... | P.J. Deville, B.Sc. (Wales), C. Chem., M.R.I.C., Dip. Agr. (Maur.) |
| | L. Ross, C. Chem., M.R.I.C.. Dip. Agr. (Maur.) |
| *Technical Officers* (I) ... ... | L.C. Figon |
| | K.F. Ng Kee Kwong, B.Sc. (Reading) |
| *Technical Officer* (II) ... ... | C. Cavalot |
| *Scientific Assistants* ... ... | Mrs. J. Gauthier |
| | I. Jhoty |
| | H. Maurice |

**Sugar Technology**

| | |
|---|---|
| *Senior Scientific Officer* ... | J.T. d'Espaignet, B.Sc. (Glasgow), A.R.C.S.T., Dip. Agr. (Maur.). (*Head of Division*) |
| *Scientific Officers* ... ... | S. Marie Jeanne, Dip. Agr. (Maur.) |
| | M. Randabel, Dip. Agr. (Maur.) |
| | E.C. Vignes, B.Sc., M.Sc. (Lond.), C. Chem., F.R.I.C., Dip. Agr. (Maur.) |
| *Technical Officers* (II) ... ... | Miss Y.L. Lan Chun Fung, B.Sc. (Hull), M.Sc. (Lond.) |
| | R. Maudarbocus, B.Sc. (Leeds), M.I. Chem. E. (Grad.) |
| *Scientific Assistants* ... ... | M. Abel |
| | L. Le Guen |
| | S. Tse Chi Shum, Dip. Agr. (Maur.) |

**Agricultural Engineering**

| | |
|---|---|
| *Senior Scientific Officer* ... | L. Li Pi Shan, B.E. (Agr.) (Sask.), Dip. Agr. (Maur.), M. I. Agr. E., M.I. Mech. E., C. Eng. (*Head of Division*) |
| *Scientific Officers* ... ... | P.Y. Chan, B.Sc., M.Sc. (Lond.), C. Chem., M.R.I.C. |
| | M. Hardy, Dip. Agr. (Maur.), |
| | G. Mazery, Dip. Agr. (Maur.) (*Part-time*) |
| *Scientific Assistants* ... ... | D. Ah Koon |
| | L. d'Espagnac |

**Administration**

| | |
|---|---|
| *Secretary-Accountant* ... ... | P.G. Du Mée |
| *Asst. Secretary-Accountant* ... | P. Rivet |
| *Confidential Clerks* ... ... | Mrs. P. Bégué |
| | Mrs. J. Cavalot |
| | Miss A. North Coombes |
| | Miss E. Cox |
| | Mrs. M. Montocchio |
| | Mrs. M.T. Rae |

**Services**

| | |
|---|---|
| *Librarian* ... ... ... | Miss M. Ly-Tio-Fane, B.A., Ph.D. (Lond.) |
| *Liaison Officer* ... ... | R. Ng Ying Sheung, Dip. Agr. (Maur.) |
| *Asst. Liaison Officer* ... ... | H. Chaillet, Dip. Agr. (Maur.) |
| *Draughtsman-Photographer* ... | L.S. de Réland, Grad. N.Y.I.P. |
| *Asst. Draughtsman-Photographer* | J. Forget |
| *Telephonist* ... ... ... | Miss G. Morin |

Also 28 Junior Technicians attached to various sections.

## THE MAURITIUS HERBARIUM

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

# FOREWORD

*Her Majesty the Queen was pleased to confer the rank of Commander of the Most Excellent Order of the British Empire on Mr. Robert Antoine in recognition of his valuable services connected with research work on sugar cane and other crops.*

*The news of this high distinction, so well-deserved, was received with pride and satisfaction by every member of the Staff and of the Board.*

*I wish to express my congratulations and those of the Board to the Director.*

*Chairman*

# IN MEMORIAM

P. OCTAVE WIEHE

1910 - 1975

The news that Paul Octave Wiehé was no more came as a painful shock to all the members of the Research Institute. He died unexpectedly of heart failure at a time when his country still needed his experience and the wealth of knowledge he had acquired more particularly in the service of the Sugar Industry of Mauritius.

Octave Wiehé was born on 21st October, 1910. He studied at the Mauritius College of Agriculture where he obtained the scholarship in 1930. After studying at the Imperial College of Science and Technology in London, he obtained an Honours Degree in Botany and the Associateship of the Royal College of Science. He started his career in the Colonial Education Service as a Science Master at the Royal College, Mauritius, a post he occupied from 1933 to 1935. He then joined the Colonial Agricultural Service as Plant Pathologist in the Department of Agriculture, Mauritius. In 1948, he was transferred to Nyasaland where he worked in the same capacity until 1953. During that year he left the Colonial Agricultural Service to become the first director of the Mauritius Sugar Industry Research Institute. In 1968 he was appointed Vice-Chancellor of the newly created University of Mauritius, a post he occupied until the end of his contract in 1973.

He is the author of numerous publications dealing not only with plant pathology, but also with ecology, such as his studies in cooperation with Reginald Vaughan on the vegetation of Mauritius.

Octave Wiehé obtained the M.Sc. in 1945 and the D.Sc. of London University in 1957 and he was elevated to the dignity of Commander of the Most Excellent Order of the British Empire in 1958.

His outstanding achievement was the creation of the Mauritius Sugar Industry Research Institute from a skeletal Sugar Cane Research Station and successfully placing it among the leading Sugar Research Organizations of the world. The other challenge he accepted with success was the Vice-Chancellorship of the newly created University of Mauritius, at a time when nothing but chaos and inertia prevailed. After his retirement, he was completing a study on sugar production for the Chamber of Agriculture when death struck him.

Octave Wiehé is deeply mourned by all those who knew him at the Research Institute not only as a very competent Director but also as a man whose charm was due not only to the keen interest he always took in his daily duties but also to a deep understanding and great simplicity of manner.

R.A.

# INTRODUCTION

**Origins of the Institute**

Organized agricultural research in Mauritius began 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 this century, it was felt that a new central organization was needed to guide the efforts of the agricultural community and in 1913 the Colonial Office created the Department of Agriculture, which absorbed the *Station Agronomique* and also the Bureau of Agricultural Statistics of the Chamber of Agriculture. The next development was in 1930, when a Sugar Cane Research Station was formed as a Division of the Department of Agriculture to cater for research and experimentation directed towards improving efficiency in the sugar industry. The Station operated until 1952 and the results of its work are to be found in 23 Annual Reports and 19 Bulletins, which contain 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 to the effect that the sugar industry should organize and conduct 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. 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 is financed mainly by means of a cess on sugar borne by all cane growers. Its programme of research is elaborated by a Research Advisory Committee, which maintains close cooperation 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, 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, Natural Resources and the Environment, 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, though to a lesser extent, for large planters (producing not less than five thousand tonnes 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.

At the inception of the Institute in 1953, the library possessed a limited collection of publications on sugar cane agronomy and sugar manufacture. The collection has been enlarged over the years and enriched with prints and original drawings of sugar cane varieties, and with publications on the history of sugar cane. Publications on other aspects of tropical agriculture and on biological sciences have also been acquired and today the library has 15 414 volumes, while the titles of periodicals and reports received total 575.

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

Owing to the distance from other research centres, library policy has been to concentrate on acquiring runs of periodicals and complete sets of many are now 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.

Publications of the Institute available for exchange with other organizations are *Annual Reports*, *Occasional Papers*, *Technical Circulars*, *Weed Flora* leaflets and occasional monographs.

**The Mauritius Herbarium**

The Mauritius Herbarium has its origins in the early 19th century. The first herbarium was housed in the Royal College, Port Louis, but was transferred in 1868 to the Royal Botanic Gardens, Pamplemousses, then under the control of the Director of Forests and Gardens. In 1928, the specimens were restored and moved to the Mauritius Institute (Public Library and Museum) to form the basis of its new botanical section. Finally in 1958, the herbaria of the Department of Agriculture and of the Sugar Cane Research Station were combined with that of the Mauritius Institute to form the Mauritius Herbarium, which was housed in the newly formed Mauritius Sugar Industry Research Institute where it became integrated with the Botany Division, the Botanist being Curator.

The Herbarium 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 on the flora of the Mascarenes by local and visiting specialists.

# GENERAL REPORT

**Board Membership**

Mr. C. Couacaud replaced Mr. J.M. Paturau, C.B.E., D.F.C., as Chairman of the Board and as the representative of the Chamber of Agriculture. Mr. R. Ramsoondar and Mr. L. Tulloo replaced Mr. G. Beeharry and Mr. S. Butan as representatives of small planters.

**Establishment**

Mr. R. Rivalland, Scientific Officer in the Division of Sugar Technology, and Mr. V. Anuth, who had been appointed Scientific Assistant in the Botany Division in January, resigned during the year.

New appointments were those of Mr. S. Tse Chi Shum as Scientific Assistant, Mr. S. Marie-Jeanne as Scientific Officer, and Mr. R. Maudarbocus and Miss Y.L. Lan Chun Fung as Technical Officers Grade II, all of whom were appointed to the Sugar Technology Division. Other appointments were those of Mr. H. Chaillet as Assistant to the Liaison Officer, and Mr. F.K. Ng Kwong as Technical Officer Grade I in the Division of Soils and Plant Nutrition.

**Finance**

Cost of living allowances equivalent to 6% and 12%, respectively, of basic salary were granted to the Staff as decided upon by Government. A thirteenth month's salary was also granted.

**Technical Assistance**

Movements of scientists whose services are provided under the Franco-Mauritian Cultural and Technical Assistance Scheme were as follows :

Mr. P. Codron, who had been attached to the Division of Plant Pathology, left in April and Messrs. G. Ecorcheville and G. Poillot, who had been attached to the Divisions of Sugar Technology and of Soils and Plant Nutrition, respectively, left in November.

Messrs. M. Patacq, D. Poulain and J.P. Roulon arrived in September and were attached to the Divisions of Sugar Technology, Plant Pathology, and Food Crop Agronomy, respectively. Messrs. P.C. Delaveau and J.M. Uro arrived in October and were attached to the Botany and Weed Agronomy Divisions, respectively.

Mr. D. Lorence, a U.S. Peace Corps Volunteer, who is attached to the Botany Division and Herbarium, assisted in the preparation of the *Flora of the Mascarene Islands*.

**Building Programme**

A very modest building programme was undertaken in 1975, the main items being modifications to the Biometry building to accommodate the computer and accessories and the addition of a Male Preparation Room for breeding work.

**Director's Missions**

The Director spent a few days in Malawi, in March, to visit the sugar cane areas. In July, he went on a mission to the U.K. and France, visiting the Tropical Products Institute, London, the Forestry Department, Edinburgh, the Rowett Research Institute, Aberdeen, the Herbarium, Kew, Richmond, and the *Museum National d'Histoire Naturelle*, Paris.

Also in July, he spent two days in Réunion, to obtain first-hand knowledge of the yellow wilt problem in that island.

In August, he went on a mission to the Seychelles to give further advice on sugar cane cultivation for fodder production. This was followed by five weeks overseas leave in Europe.

In November, he led a mission sponsored by the Mauritius Chamber of Agriculture, which spent two weeks visiting the Queensland sugar belt to report on mechanization of agricultural operations with special emphasis on harvesting and transport of the cane crop.

Finally, as local Chairman, he led the Mauritius delegation in November to the meeting of the *Comité de Collaboration Agricole* held in Réunion Island.

**Staff Movements**

Mr. J.C. Autrey returned from the U.K. in December after 14 months study leave during which he obtained the degree of M.Sc. in Plant Pathology at the University of Exeter.

Mr. J. Deville returned in August after spending 12 months study leave at the University College of North Wales.

Dr. C. Ricaud attended the Golden Jubilee Convention of the Sugar Technologists Association of India, where he delivered a paper on leaf scald, and then visited the Sugar Cane Breeding Institute, Coimbatore, and the Central Potato Research Institute, Simla.

Dr. J.R. Williams went to Java in July to collect parasites of the sugar cane scale insect.

Dr. R. Pillay, Dr. Y. Wong You Cheong, Messrs. P.R. Hermelin, J.R. Moutia, M. Abel, M. Hardy, P.G. Du Mée, C. Cavalot and Mrs. J. Gauthier went on overseas leave. The following visits were made by these officers while on leave :

Dr. Pillay visited vegetable research Stations in England, Australia and Taïwan, and the International Rice Research Institute in the Philippines.

Dr. Wong You Cheong visited the Tropical Products Institute in London and, in France, the *Compagnie Française de Fumure Naturelle* and the *Groupement d'Études et de Recherches pour le Développement de l'Agronomie Tropicale (GERDAT)*. He also visited the International Atomic Energy Agency in Vienna.

Mr. Abel visited the firm Perkin Elmer, manufacturers of gas chromatograph equipment, to obtain training in the use of equipment manufactured by them.

Mr. Cavalot visited Rothamsted Experiment Station in England and, in France, called at the *Office de la Recherche Scientifique et Technique Outre-Mer* in Paris.

**Comité de Collaboration Agricole**

The 23rd annual meeting of the *Comité* was held in Réunion from 29th November to 4th December. No delegates from Madagascar and the Comores Islands attended.

The Mauritius delegation comprised the Director, who was head of the delegation, Mr. A.P. Dalais, Vice-President of the Mauritius Chamber of Agriculture, Mr. C. Delaître, Ministry of Agriculture, Natural Resources and the Environment, Mr. J.T. d'Espaignet, President of the *Société de Technologie Agricole et Sucrière de l'Ile Maurice*, Mr. G. Langlois, Vice-President of the *Comité Central des Administrateurs de Sucreries* and Mr. P.G. Du Mée, Secretary-Treasurer of the *Comité*.

It was decided that the next meeting would be held in Mauritius in October 1976.

Dr. Y. Wong You Cheong, Dr. C. Ricaud and Mr. G. Mazery paid visits to Réunion under the auspices of the *Comité* during the year.

**Personalia**

The following visitors were welcomed at the Institute during 1975 : Mr. A. Barber, Tropical Stored Products Centre, U.K., Prof. Barker, Tate & Lyle Ltd., U.K., Mr. P.E. Barker, University of Aston, Birmingham, U.K., Mr. P.D. Baswick, CSIRO, Australia, Mr. R. Berthet, *Fédération Nationale des Producteurs de Pommes de Terre*, Paris, Mr. D.F. Blaxell, Royal Botanic Gardens, Kew, U.K., H.E. Mr. H. Brind and Messrs. B. Pease and P. Charters, British High Commission, Mauritius, Mr. D. Burrenchobay, Prime Minister's Office, Mauritius, Mr. J. Calembert, *Faculté des Sciences Agronomiques*, Gembloux, France, Mr. J. Cahin, ODM, East Africa Development Division, U.K., Mr. L.R. Chaperon, Minister of Education, Mauritius, Messrs. Philip K.S. Clinton and J.F. Hebblethwaite, Monsanto S.A., Sandton, South Africa, Mr. E.D. de Casterlé, UNDP, Mauritius, Mr. G. Desjardin, *Agence de Coopération Culturelle et Technique*, France, Mr. G. Detraux, *Traction & Electricité*, Brussels, Mr. B. Disari, *Radio Alger*, Algeria, Messrs. Everard and Brain, UNESCO, Messrs. R.K. Jones and T.J. Johnson, Plantation Agencies SDN Berhad, Malaysia, Mr. and Mrs. Jorgensen, Mossman Central Mill Co. Ltd., North Queensland, Australia, Colonel Kashmir and Mr. E. Mandari, Kilombero Sugar Co., Tanzania, Mr. E. Latrille, *IRAT*, Paris, Mr. John Lyle, Mrs. Jill Lyle and Mr. Michael Anfield, Tate & Lyle Ltd., U.K., H.E. Mr. Philip W. Manhard, U.S. Embassy, Port-Louis, Messrs. F.O. Moreno and M.P.R. Mouras, Pedro Ometto S.A., Brazil, Mr. B.M. Padya, Meteorological Station, Mauritius, Mr. C. Plitoff, *Organisation Internationale du Sucre*, London, U.K., Miss C. Prosper and Mr. D. O'Neill, University of Stirling, Scotland, Mr. A. Quaglino, University of Torino, Italy, Mr. Jean Sevérac, *Directeur Général Adjoint*, *ORSTOM*, Mr. Smyth, Beckman G. Ltd., South Africa, Messrs. Victor Verbois and André Pécheux, *Mission Française de Coopération* (*Maurice*).

**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 : Miss A. Adler, Stanford University, U.S.A., Mrs. A. Alford, Tate & Lyle Ltd., U.K., Dr. A. Cornu, *CERF*, Réunion, Messrs. D.B. De Silva and K. Kunarajah, Shri Lanka Sugar Corporation, Mr. J. Dookley, Ministry of Agriculture, Seychelles, Messrs. A. Gibbs, R.F. Schafer and A. Lufwendo, Zambia Sugar Company Ltd., Dr. S. Graham, Messrs. B. Moor and J. Van Dokkun, Tongaat Sugar Ltd., South Africa, Mr. P.K. Jayatilake, Shri Lanka Sugar Corporation, Messrs. N. Kartohadikœsœmo and S. Sœhardjo, Indonesian Sugar Experiment Station, Messrs. K.M. Kshatriya, M.S. Pawar, A.B. Patel, S.C. Jolly and R.M. Jagdannea, Deccan Sugar Technologists' Association, India, Messrs. C.G. Mc Lennan and W.A. Greenwood, Proserpine Cooperative Sugar Milling Association, Australia, Dr. E. Rochecouste, Du Pont de Nemours, Australia, M.P. Rœderer, *ORSTOM*, Paris, Mr. G.A.M. Sharman, Rowett Research Institute, Scotland, Mr. D.H. Tayson, Ministry of Agriculture and Rural Economy, British Solomon Islands, Mr. S.U. Wanigaseka, Ceylon Tobacco Co. Ltd.

**Aimé de Sornay Scholarship**

The scholarship was awarded in 1975 to Mr. Nazim Uddin Bhugeloo, who ranked second at the Entrance Examinations of the University of Mauritius.

Miss D. Lam King Kam, the 1972 scholar, obtained the Combined Diploma in Agriculture and Sugar Technology.

The studies of the other two scholars, Miss C. Jomadar and Mr. A. Carles, progressed satisfactorily.

**University of Mauritius**

Lectures at the University were delivered by several members of the staff. Staff representation on Boards and Committees of the University are given in the following section of this report.

**Representations on Boards and Committees by Members of Staff**

Advisory Committee on Agricultural Matters, University of Mauritius
Dr. Julien

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

Bagasse-Molasses Committee, Chamber of Agriculture
Dr. Wong, Mr. d'Espaignet

Board of Agriculture, Fisheries and Natural Resources
Director

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

Board of Examiners for the Registration of Agricultural Chemists
Mr. D. de R. de St. Antoine, Mr. Vignes

Board of Examiners, School of Agriculture, University of Mauritius
Mr. d'Espaignet, Mr. Randabel, Mr. Vignes

Cane Release Committee
Director (Chairman), Mr. Lalouette, Dr. Ricaud

*Comité de Collaboration Agricole Maurice-Réunion-Madagascar*
Director, Mr. Du Mée

*Comité Engrais, Chambre d'Agriculture*
Dr. Wong

*Comité, Société de Technologie Agricole et Sucrière de Maurice*
Director, Mr. D. de R. de St. Antoine, Mr. d'Espaignet, Mr. Randabel, Mr. Figon, Dr. Ricaud

Committee for the International Hydrological Decade
Mr. Li Pi Shan

*Conseil d'Administration, La Revue Agricole et Sucrière de l'Ile Maurice*
Director, Mr. D. de R. de St. Antoine (President), Mr. Rouillard, Mr. Randabel

Council, Professional Engineers' Association (Mauritius)
Mr. d'Espaignet

Council, Registered Professional Engineers
Mr. d'Espaignet

Council, Royal Society of Arts and Sciences of Mauritius
Director, Mr. D. de R. de St. Antoine, Mr. Rouillard, Mr. Mamet, Dr. Ricaud, Dr. Ly-Tio-Fane

Council, University of Mauritius
Director

Court of the University of Mauritius
Director, Dr. Julien, Mr. Vignes
Food Crops Insurance Committee
Mr. Mamet
International Society of Sugar Cane Technologists
Director (Regional Vice-Chairman), Dr. Ricaud (Chairman, Pathology Section)
Irrigation Committee
Mr. Mazery
Livestock Committee, Chamber of Agriculture
Dr. Wong
Mauritius National Committee for ICUMSA (International Committee for Uniform Methods of Sugar Analysis)
Mr. D. de R. de St. Antoine (Chairman), Dr. Ricaud, Mr. Vignes
Mauritius National Committee for UNESCO
Dr. Ricaud
Mauritius Sub-Committee for preparation of the *Flora of the Mascarene Islands*
Director (Chairman), Dr. Julien
Ministry of Agriculture, Natural Resources and Environment: Man and Biosphere Advisory Committee
Dr. Julien, Dr. Ricaud
National Food Production Steering Committee, Chamber of Agriculture
Director, Mr. Mamet
Plant Introduction and Quarantine Standing Committee
Dr. Ricaud, Dr. Williams
Permanent Advisory Committee for the Royal Botanic Gardens, Pamplemousses
Dr. Julien
Pesticides Control Board
Dr. Ricaud, Dr. Williams
Senate, University of Mauritius
Dr. Ricaud
Sugar Technology Sub-Committee, University of Mauritius
Mr. d'Espaignet

**Lectures and Meetings at Head Office**

*20th January* — H.A. Von Derschau — Demonstration of an automatic polarimeter and a refractometer[1]

*13th May* — R. Antoine — *Revue des travaux du MSIRI en 1974 (champs)* — A. *La canne.*

*20th May* — J. T. D'Espaignet — *Revue des travaux de la Division de Technologie Sucrière en 1974.*

*27th May* — R. Antoine — *Revue des travaux du MSIRI en 1974 (champs) — B. Cultures autres que la canne.*

*28th May* — R. Thompson — Aquaculture of the Giant Fresh Water Prawn *Macrobrachium rosenbergii*[2]

*24th June* — R. Julien — *Résultats préliminaires des essais sur la maturation de la canne à sucre.*

*22nd July* — Y. Wong You Cheong — *Coup d'œil sur la fertilisation de la canne à sucre.*
*11th September* — Y. Coppens — *Recherche des ancètres de l'homme en Afrique* (*Territoire Français des Afars et des Issas*)[3]
*16th September* — C. Ricaud — *Les maladies du maïs.*
*19th September* — S.W. Baxter — (Film show on cane harvesters with commentary)
*26th September* — S. Temple — Geographical ecology and conservation of birds in the Indian Ocean[3]
*4th November* — G. Mc Intyre — *Utilisation des herbicides* — A. *Dans la canne à sucre*, B. *Dans les cultures vivrières* (*Résultats préliminaires*).
*17th November* — P. Rœderer — *La flore des Mascareignes*[4]
*20th November* — P. Rœderer — *La recherche scientifique à l'ORSTOM*[4]
*11th December* — J. Younger — (Film show on cane harvesters with commentary).
*12th December* — G.A.M. Sharman — (Film show on deer farming with commentary)[5]
*16th December* — R. Antoine — *Variétés de cannes à sucre pour la grande culture.*

(1) Meeting under the auspices of the *Societe de Technologie Agricole et Sucriere de l'Ile Maurice.*
(2) Meeting under the joint auspices of the *Societe de Technologie Agricole et Sucriere de l'Ile Maurice* and the Royal Society of Arts and Sciences.
(3) Meeting under the auspices of the Royal Society of Arts and Sciences
(4) Meeting under the joint auspices of the *Centre Culturel d'Expression Française* and the MSIRI.
(5) Meeting under the auspices of the Mauritius Meat Producers Association.

**Library Affairs**

A collection of technical books was presented to the library by Mr. Amédée Maingard de Ville-ès-Offrans, C.B.E., D.S.O.

A committee was appointed to study the creation of a Central Sugar Library in Berlin, as recommended by Resolution No. 5 of the 15th Congress of the International Society of Sugar Cane Technologists held in Durban in June, 1974. Its members are : Professor Dr. Ing. Anton Baloh, Director, *Institut für Zuckerindustrie*, Berlin; Dr. M.C. Bennett, Tate & Lyle Enterprises Ltd., England, Professor E. Malavolta, *Escola Superior de Agricultura "Luiz de Queiroz"*, Brazil and Mr. Robert Antoine, C.B.E., MSIRI, Mauritius.

Mrs. Ann Alford, Librarian, Tate & Lyle Group Research and Development, Reading, visited Mauritius from 20th-29th September 1975, to discuss library affairs of mutual interest.

**Acknowledgements**

The Institute is, of course, deeply involved in the development of Mauritian agriculture and the proper conduct of its work depends a great deal on the active assistance and participation in its affairs of various sections of the agricultural community. It is again a pleasure to acknowledge the cooperation of Sugar Estate Managers and their staff, particularly the Estate Agronomists and that of the Ministry of Agriculture, Natural Resources and Environment. The advice and support of the Chairman and Members of the Executive Board of the Institute, and the loyal endeavours of the staff, are also acknowledged with gratitude.

*Director*

# Technical Report

GENERAL

Plate I. View from Forbach Hill southwards towards Grande Rosalie, showing the Late Lava Coastal Plains (land units 1.1, 1.2, 1.3 and 1.4) in the foreground, the Northern Intermediate Plains and Slopes (land units 2.1 and 2.3) in the middle ground, and the Lower Mountain Slopes (land unit 10.1 and 10.2) and the Old Volcanic Mountains (land unit 11.1) in the background.

# TECHNICAL REPORT

## GENERAL

### Land resources survey and land use recommendations

The land resources at Mon Désert-Alma S.E. and Savannah S.E. were studied in detail by means of aerial photo-interpretation and field surveys. The land resources were identified in terms of land complexes and land units (Plate I). Factors limiting land productivity were determined and measures for increasing productivity were recommended. A comprehensive plan was also suggested for maximum agricultural diversification within cane lands.

A set of thirteen sheets of land ownership maps of Mauritius at scale 1 : 25 000 was retraced.

### Publications during the year

Anon. (1975). *Les cultures vivrières. 2. L'Arachide.* Mauritius Sugar Industry Research Institute. 24 pp.

Anon. (1975). *Les cultures vivrières. 3. Le Maïs.* Mauritius Sugar Industry Research Institute. 20 pp.
Both the above are advisory booklets based on television talks given by staff of the Institute.

Antoine, R. (1975). La méchanisation de la culture de la canne au Queensland. *Revue agric. sucr. Ile Maurice* **54** : 190-204.

Arlidge, E. Z. (Comp.) (1975). *Rodriguez Island — Land Suitability Map, 1 : 20 000.* Food and Agriculture Organization of the United Nations and Mauritius Sugar Industry Research Institute.

Arlidge, E.Z. and Wong You Cheong, Y. (1975). Notes on the land resources and agricultural suitability map of Mauritius, 1 : 50 000. *Occ. Paper Maurit. Sug. Ind. Res. Inst.* **29**, 137 pp.
This publication is designed to accompany the Land Resources and Agricultural Suitability Map of Mauritius, which was issued in 1973. It describes in detail the methods used for preparation of the map, the importance and the choice of the main land physical characteristics, and the criteria determining land suitability. The final chapter describes the role of land suitability classification in planning land usage.

Chan, P.Y. and Li Pi Shan, L. (1975). Some soil moisture data and their application to irrigation of sugar cane. *Revue agric. sucr. Ile Maurice* **54** : 115-119.
Moisture constants for most of the soils under cane cultivation in Mauritius are given and their use in irrigation practice is described.

Félix S. and Ricaud, C. (1975) Chemical control of late blight of potatoes in Mauritius. *Revue agric. sucr. Ile Maurice* **54** : 205-210.
The fungicides that gave best control of potato blight in trials during 1970-74 were Dithane M-45 and Daconyl. It was concluded that perfect blight control can be achieved economically during epidemic conditions by applying 2.5 lb Dithane M-45/50 gall/ 16 000 ft of row every fourth day with power sprayers.

Julien, H.R. (1975). Revue des travaux effectués sur la canne à sucre avec les "Ripeners". *Revue agric. sucr. Ile Maurice* **54** : 34-40.
Three sugar cane ripeners have been evaluated in Mauritius — Ethrel, Racuza and Polaris. Polaris was shown to increase sucrose content of immature canes. The response depended on the variety, time of application, dosage rate and interval between application and harvest. This chemical was also shown to have growth-inhibiting properties. Ethrel and Racuza did not increased sucrose content or sugar yields.

Julien, H.R. and Soopramanien, G.C. (1975). Effects of night breaks on floral initiation and development in *Saccharum*. *Crop Sci.* **15** : 625-629.

The effect of night breaks with light of different spectral composition applied at various stages of floral development from before induction to inflorescence emergence was studied in clones of *Saccharum spontaneum* and *S. robustum*. Night interruptions with incandescent light at any stage of development decreased % inflorescence emergence and delayed flowering in *S. spontaneum*. In both *S. robustum* and *S. spontaneum* the degree of inhibition of flowering depended on the stage of development when interruptions were applied; the early stages of differentiation of the inflorescence (initiation of inflorescence axis and branch primordia) were the most sensitive. The spectral composition of the light was also important : red, orange and green light generally inhibited inflorescence development most, while far-red and ultra-violet were ineffective and similar to darkness. Attempts to reverse the inhibitory effect of red light by far-red light failed. The inhibitory effect of night breaks was maximal towards the end of the dark period and minimal at the middle of the dark period.

Ly-Tio-Fane, M. (1974). *Le séjour de Commerson à l'Isle Bourbon, 1770-1771.* Actes du Colloque Commerson, Octobre 1973. Cahiers du Centre Universitaire de la Réunion, No. spécial : 111-116

A sketch of Commerson's botanical and scientific work in Réunion.

Mamet, J.R. (1975). Two new species of Diaspididae from Agalega (Indian Ocean) (Hom., Coccoidea) *Bull. Soc. ent. France* **79** : 166-168.

Mamet, J.R. and Pillay, A.R. (1975). Potato seed production. 1. Effect of seed size on yield and tuber size distribution of the variety Mariline. *Revue agric. sucr. Ile Maurice* **54** : 30-33.

The effect of using seed of different size planted at the same density on tuber-production in var. Mariline is described. Total yield of tubers in the size range of 40 - 110 g increased with increase in seed size. The most economic return was obtained with seed of size grade 58 g.

McIntyre, G. (1975). Propriétés du Roundup et recommandations générales pour son utilisation sur plusieurs espèces d'herbes. *Revue agric. sucr. Ile Maurice* **54** : 165-166.

The post-emergence herbicide Roundup is rapidly decomposed in contact with soil. Absorbed through the leaves, it is translocated to the underground parts of the plants. A dry day is needed for its application. Roundup gives good control of a number of weeds, including *Cyperus rotundus* (Herbe à oignons), *Paspalidium geminatum* (Herbe sifflette), *Paspalum paniculatum* (Herbe duvet), *P. urvillei* (Herbe cheval), *P. conjugatum* (Herbe créole), *P. distichum* (Chiendent de mare), *Colocasia antiquorum* (Songe) and *Kyllinga monocephala* (Petit mota).

McIntyre, G. (1975). Résultats d'expériences herbicides dans diverses cultures vivrières. *Revue agric. sucr. Ile Maurice* **54** : 167-171.

Experiments showed that the herbicides Sencor and Linuron could be safely used in potatoes a few days after planting and that the single earthing-up six weeks after planting, which is then to be recommended, does not adversely affect yield. Linuron, Preforan and Cobex were used successfully in pre-emergence sprays in beans and peas, and Sencor and Prometryne, applied similarly, were successful in carrots.

Ng Kee Kwong, K.F. and Huang, P.M. (1975). Influence of citric acid on the crystallization of aluminium hydroxides. *Clays Clay Miner* **23** : 164-165.

The formation of aluminium hydroxides in the presence of citric acid was investigated by x-ray diffraction and electron microscopy. The crystallization of the aluminium hydroxides was found to be inhibited by citric acid and their surface features depended on the concentration of citric acid.

Pillay, A.R. (1975). Adsorption in soil and influence of soil depth on phytotoxicity of Diuron and Neburon. *Revue agric. sucr. Ile Maurice* **54** : 172-176.

The Freundlich isothermal relationship was used to determine adsorption of Diuron and Neburon in soil. With algae as test organisms, and a given soil-water ratio, five times more Neburon than Diuron was adsorbed by one gram of soil. The doses of Diuron required to produce 50% inhibition of growth of oats and algae decreased with increasing soil depth. The toxicity of the herbicide was greater in subsoil layers than in the top soil, which has a higher organic carbon content.

Pillay, A.R., Tchan, Y.T. and Cho, K.Y. (1975). Nucleic acids in chloroplasts of a *Chlorella* sp. *Proc. Linn. Soc. New South Wales* **99** : 197-201.

Nucleic acids in chloroplasts of *Chlorella NM1* were demonstrated by light and electron microscopy. The chloroplasts were positively stained by Feulgen stain. Electron microscopical examination showed five filmentous fibrils in association with lamellar membranes and ribosomes. The fibrils were not observed after treatment with deoxyribonuclease. It was concluded that the fibrils contain DNA and their significance is discussed.

Randabel, M. (1975). Notes on temperature control in polarimetry and refractometry. *Tech. Circ. Maurit. Sug. Ind. Res. Inst. (sp. Tech. Ser.)* **3** and *Revue agric. sucr. Ile Maurice* **54** : 110-114.

Recommendations for temperature control to obtain maximum accuracy in polarimetry and sacharimetry are reviewed. It is considered that laboratories should be air-conditioned and also that refrigerated thermostatic water baths set at exactly 20°C should be used.

Ricaud, C. (1975). Pesticide use and hazards in Mauritian agriculture. *Revue agric. sucr. Ile Maurice* **54** : 143-148.

The basic concepts of pesticide hazards are briefly discussed. Trends in the use of different pesticides in Mauritian agriculture and actual and potential hazards are described.

Ricaud, C. and Félix, S. (1975). Growers guide to seed potato production. *Mauritius Sugar Industry Research Institute, Growers Guide Series*, No. 1, 30 pp.

The methods to be used for production of seed potatoes in Mauritius and the Seed Potato Certification Scheme are described in detail. Information is provided on diseases and defects of potato in Mauritius.

Rouillard, G. (1975). Histoire des domaines sucriers de l'Ile Maurice. VIII. Grand Port. *Revue agric. sucr. Ile Maurice* **54** : 1-26; **54** : 77-94.

The settlement of the district of Grand Port is described. Historical notes on the 54-odd mills that have worked in the district are given : of these, Savannah, Mon Trésor, Rose Belle and Riche-en-Eau are still active.

Tursan D'Espaignet, J. (1975). Review of performance of sugar factories in 1974. *Revue agric. sucr. Ile Maurice* **54** : 62-69.

Tursan D'Espaignet, J. (1975) Review of performance of sugar factories in 1975. *Revue agric. sucr. Ile Maurice* **54** : 185-189

Vaughan, R.E., McIntyre, G. and Guého, J. (1975). *Weeds of Mauritius.* Leaflet **15;** 21 — *Colocasia antiquorum* Linn. (Songe blanc). Aug. 1975, 4 pp. 1 pl. Leaflet **16;** 22 — *Paspalum paniculatum* Linn. (Herbe duvet), 23 — *Paspalum commersonii* Lam. (Herbe à épée). Aug. 1975, 6 pp. 1 pl.

Vignes, E.C. (1975). The determination of sucrose in cane final molasses, *Z. Zuck. Ind.* **25** : 561-564.

Four methods for determining sucrose in molasses were compared. These were the Double Polarization method of Jackson and Gillis No. IV, the A.O.A.C. chemical method, the Sugar Research Institute (Mackay) Acid Inversion method, and the Canadian National Committee method. Statistical analysis of the results showed the Double Polarization method to be the most reliable and it was concluded that it would be against the interests of all concerned to abandon it.

Williams, J.R. (1975). The Cixiidae (Fulgoroidea : Homoptera) of Mauritius. *J. nat. Hist.* **9** : 169-204.

Thirty-two species of Cixiid leafhoppers, sixteen of which are described as new species, are recorded from Mauritius.

Williams, J.R. (1975). Cixiidae (Fulgoroidea : Homoptera) from Réunion Island. *J. nat. Hist.* **9** : 669-680.

An account is given of Cixiid leafhoppers collected in Réunion Island during December, 1973. Ten species are recorded, one of which is new.

Wong You Cheong, Y. (1975). The land resources of Mauritius. *Commerce* (*Bombay*) **131** (3371) : 38-40.

The land resources of Mauritius are defined in terms of thirteen "land complexes", which are made up of fourty-four "land units". An actual and a potential suitability classification has been worked out for each "land utilization type". Three orders of suitability, eight suitability classes and an unlimited number of suitability sub-classes have been recognised.

SUGAR CANE

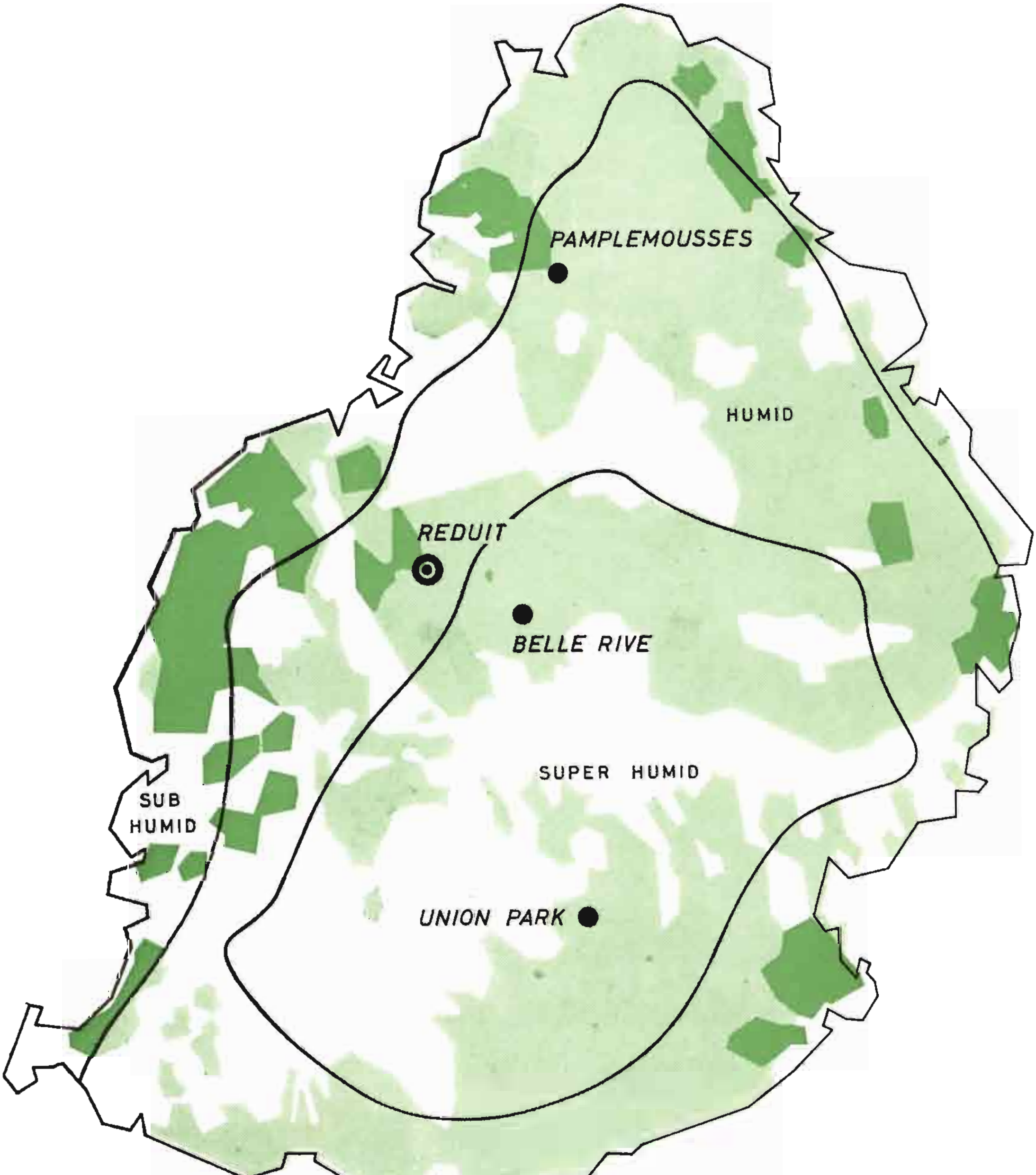



Fig. 1. The three main climatic zones, the sugar cane areas (light green, non-irrigated; dark green, irrigated), and the location of Sugar Experiment Stations.

## 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 | | |
| *Annuol 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° |
| | *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 |
| | occasional | 159 | 945 | — | 824 | — |
| Surface | intensive | 3165 | 568 | 137 | 986 | 42 |
| | occasional | 407 | 426 | 168 | 358 | 546 |
| *Area* (1000 ha) | Total | 24 | 38 | 30 | 68 | 27 |
| | Under cane | 6 | 23 | 22 | 26 | 10 |
| *Cane production, 1975* (1000 tonnes) | | 326 | 1012 | 1082 | 1369 | 527 |
| *Sugar production, 1975* (1000 tonnes) | | 38 | 106 | 114 | 151 | 59 |

# SUGAR CANE

## The 1975 crop

Rainfall early in the season was below normal except for the second half of December in the West, where it was 153 mm (normal 80 mm). Nevertheless, crop production was estimated at the end of January at between 710 000 and 720 000 tonnes of sugar.

Intense cyclone *Gervaise* passed over Mauritius on the 6th of February with gusts of 204 km/h (127 mph), although a record gust of 280 km/h (174 mph) occurred at Mon Désert-Alma. The lowest pressure recorded during the passage of the cyclone, which was accompanied by heavy rain, was 951 millibars. Little more than a month later, on the 16th March, *Inès*, a small depression of moderate intensity, passed about 96 km (60 miles) south of Mauritius with gusts of up to 113 km/h (70 mph). Weather following the cyclones was generally bad, with rainfall below normal except in the second half of May. Maximum temperatures were generally above normal and minimum temperatures below normal.

During the maturation period, weather was generally favourable, with above normal rainfall occurring only in September and minimum temperatures only slightly above normal. However, the sucrose content of canes was low because of their poor physiological condition, a result of the adverse effects of cyclonic winds.

On the whole, the serious damage caused to sugar plantations by cyclone *Gervaise* was aggravated by Inès, and subsequent weather did not allow the crop to recover. As a result, sugar production was only 469 207 metric tonnes compared to 698 201 metric tonnes the previous year.

Field experimentation was also severely affected and no information could be derived from several trials.

Details of the 1975 crop, of weather during the crop year, and of the varieties cultivated are given in Table 1 and Figs. 2-6.

**Table 1. The 1975 and 1974 crops compared**

| | 1975 | | 1974 | |
|---|---|---|---|---|
| Area cultivated, hectares* | 86 394 | (204 677) | 86 691 | (205 431) |
| Area harvested, hectares* | | | | |
| Miller-Planters | 44 231 | (104 788) | 43 904 | (104 038) |
| Planters | 35 945 | ( 85 157) | 35 977 | ( 85 258) |
| Total | 80 176 | (189 945) | 79 881 | (189 296) |
| Weight of canes, tonnes | 4 316 115 | | 5 963 655 | |
| Tonnes cane per hectare* | | | | |
| Miller-Planters | 63.0 | (26.6) | 87.9 | (37.1) |
| Planters | 42.7 | (18.0) | 58.3 | (24.6) |
| Average, Island | 53.8 | (22.7) | 74.7 | (31.5) |
| Commercial sugar recovered % cane | 10.85** | | 11.68*** | |
| Tonnes sugar per hectare * | | | | |
| Miller-Planters | 6.87 | (2.90) | 10.26 | (4.33) |
| Planters | 4.63 | (1.95) | 6.80 | (2.87) |
| Island | 5 84 | (2.46) | 8.72 | (3.68) |
| Total duration of harvest (days, Sundays and public holidays excluded) | 149 | | 157 | |
| Sucrose % cane | 12.56 | | 13.26 | |
| Fibre % cane | 13.97 | | 12.77 | |
| Tonnes sugar 98.5° pol. | 469 207 | | 698 201 | |

* Equivalent figures for arpents are given in brackets
** Equivalent to 9.2 tonnes of cane per tonne of sugar
*** Equivalent to 8.6 tonnes of cane per tonne of sugar

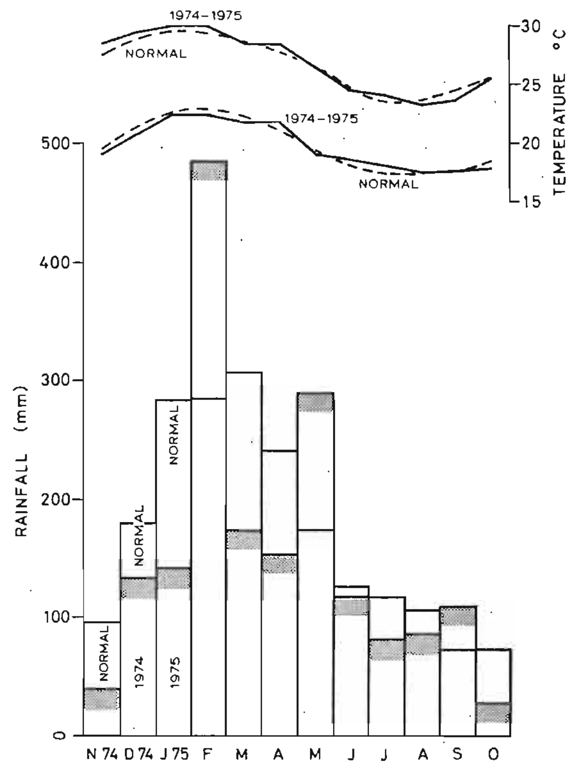



Fig. 2. Average rainfall, and maximum and minimum temperatures, over the cane area in 1975 compared to normal.

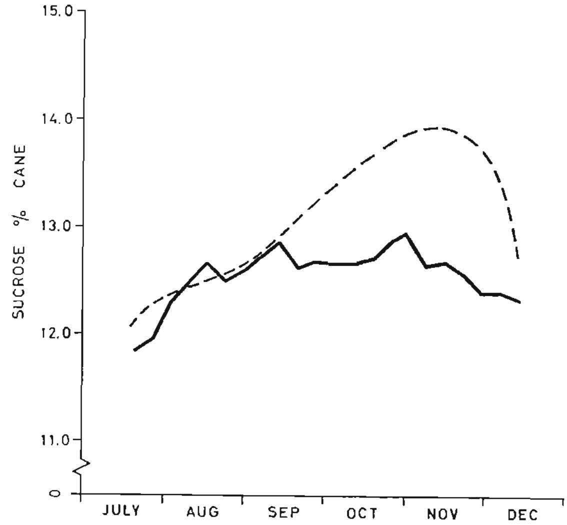



Fig. 3. Variation in sucrose % cane during the harvest season of 1975 (plain line) compared to the 1970-74 average (broken line).

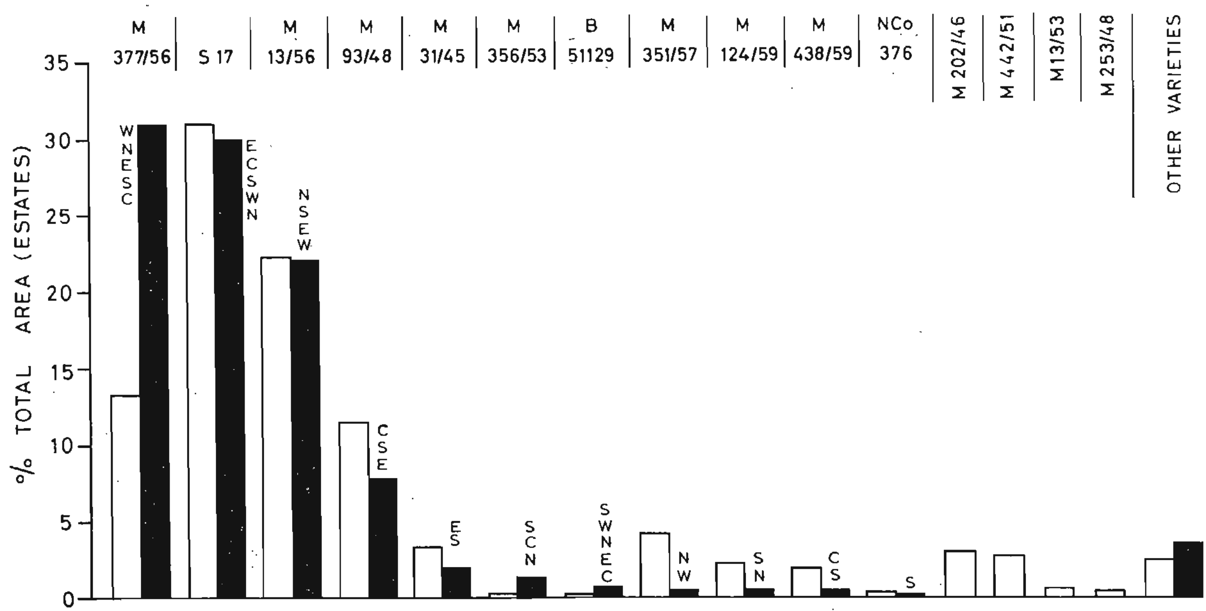



Fig. 4. Varietal trend in 1975 as illustrated by area under cultivation (plain columns) and area planted during the year (black columns). Letters denote sectors arranged in descending order of magnitude of plantations.

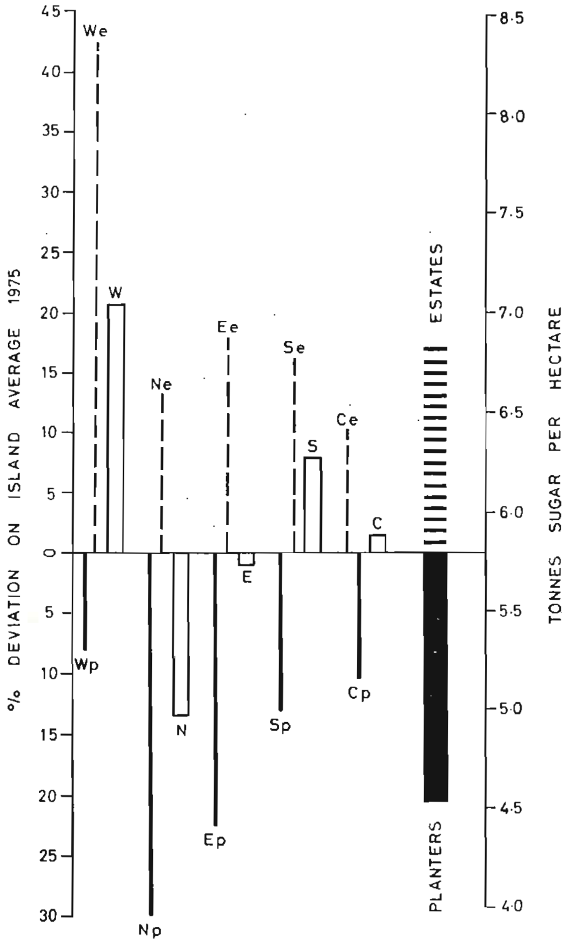



Fig. 5. Relative yields of sugar/ha in different sectors. Average island yield 5.84 tonnes of 98.7° pol sugar/ha (2.46 tonnes/arp.). Plain lines, planters; broken lines, estates; columns, sector averages.

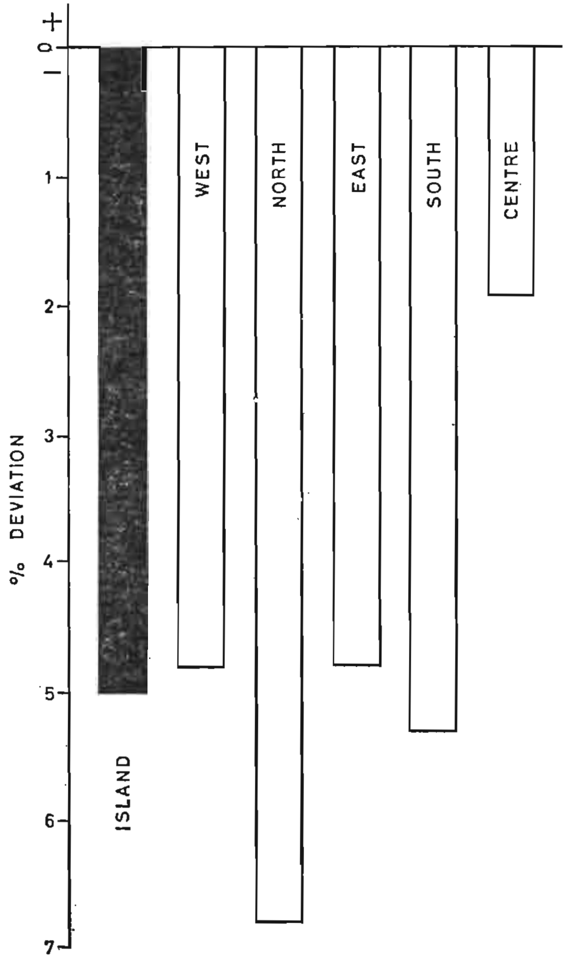



Fig. 6. Sugar manufactured % cane in 1975 for the various sectors expressed as % deviation from the 1970-74 average.

## BREEDING AND VARIETIES

### Crossing

The crossing period lasted from May 13th to August 3rd. The number of crosses made was 1133 and they involved 488 combinations and 240 parents, the latter comprising 32 clones as male, 123 as female, and 85 as both male and female. The nobilization programme accounted for 62 crosses involving 44 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 450 seedlings.

## Selection

A summary of the preliminary phases of variety testing in 1975 is given in Table 2.

**Table 2. Summary of variety testing in 1975. Preliminary phases**

| *Stage* | *Series* | *Crop Cycle* | *Different varieties* | *Total locations* |
|---|---|---|---|---|
| | | **(i) Stages measured and selected** | | |
| 1. Seedling | M/73 | Plant Cane | 63 245 | 18 263 |
| 2. Bunch Selection Plot | M/72 | Plant Cane | 17 780 | 17 780 |
| 3. Propagation Plot | M/70 | 1st Ratoon | 2298 | 3609 |
| 4. 1st Selection Trial | M/67 | 2nd Ratoon | 81 | 86 |
| ,, ,, | M/66 | 2nd Ratoon | 83 | 88 |
| ,, ,, | Foreign | 2nd Ratoon | 27 | 54 |
| | *Total measured and selected* | | *83 514* | *29 880* |
| | | **(ii) Stages measured** | | |
| 3. Propagation Plot | M/71 | Plant Cane | 2893 | 5011 |
| 4. 1st Selection Trial | M/69 | Plant Cane | 82 | 90 |
| ,, ,, | M/68 | 1st Ratoon | 113 | 120 |
| ,, ,, | Named | 1st Ratoon | 1 | 1 |
| | *Total measured* | | *3089* | *5222* |
| | | **(iii) Stages planted** | | |
| 1. Seedling | M/74 | | 67 511 | 23 441 |
| 2. Bunch Selection Plot | M/73 | | 16 958 | 16 958 |
| 3. Propagation Plot | M/72 | | 2056 | 2805 |
| 4. 1st Selection Trial | M/41 | | 1 | 2 |
| ,, ,, | M/70 | | 103 | 110 |
| ,, ,, | Foreign | | 25 | 40 |
| 5. 1st Multiplication M1 | M/66 | | 18 | 18 |
| ,, ,, | M/67 | | 21 | 21 |
| ,, ,, | Foreign | | 4 | 4 |
| | *Total planted* | | *86 697* | *43 399* |
| | *Grand Total* | | *173 300* | *88 501* |

About 2.25 ha (5.32 arp) of multiplication plots containing 75 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). Owing to a breakdown in the hot water tank at Réduit, it was not possible to hot-water treat planting material used for M2 and M3. Planting material used for M1, however, received a short hot water treatment (52°C/20 min) at Highlands Sugar Factory.

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, B 51129 was also planted in M5 nurseries to enable distribution of this variety to the planting community in 1976. The areas planted to each variety at various sites are shown in Table 3.

**Table 3. Areas (ha) of M4 & M5 Nurseries established on Estates in 1975**

| *Nursery Site* | *M4* | | | | *M5* | | | | | *Total* |
|---|---|---|---|---|---|---|---|---|---|---|
| | *M 391/60* | *M 1955/ 62* | *M 2207/ 62* | *M 94/63* | *B 51129* | *M 1595/ 61* | *M 574/ 62* | *M 1227/ 62* | *M 2370/ 62* | |
| Beau Champ | 0.21 | 0.21 | 0.21 | 0.15 | 1.85 | 1.24 | 1.57 | 1.06 | 1.27 | 7.77 |
| Belle Vue | 0.38 | 0.33 | 0.25 | 0.27 | 2.63 | 2.47 | 3.90 | 2.64 | 2.57 | 15.44 |
| Bénarès (Union) | 0.24 | 0.07 | 0.06 | 0.09 | 2.64 | 1.16 | 1.16 | 1.16 | 1.16 | 7.74 |
| F.U.E.L. | 0.16 | 0.11 | 0.08 | 0.09 | 0.70 | 0.32 | 0.22 | 0.84 | 0.48 | 3.00 |
| Médine | 0.14 | 0.15 | 0.09 | 0.13 | 1.48 | 0.73 | 1.12 | 0.75 | 0.78 | 5.37 |
| Mon Désert | 0.08 | 0.80 | 0.08 | 0.11 | 1.24 | 0.68 | 2.38 | 1.18 | 2.29 | 8.12 |
| Mon Trésor | 0.23 | 0.15 | 0.11 | 0.07 | 0.60 | 1.29 | 2.12 | 1.12 | 1.16 | 6.85 |
| Riche-en-Eau | 0.08 | 0.11 | 0.05 | 0.10 | 1.16 | 0.99 | 0.89 | 0.91 | 1.14 | 5.43 |
| TOTAL | 1.52 | 1.21 | 0.93 | 1.01 | 12.30 | 8.88 | 13.36 | 9.66 | 10.85 | 59.72 |

*1st Testing : T1*

Two series of four trials each were planted in 1975. In each series the trials were laid out as 5×5 lattice squares with 3 replications. One series included 20 varieties and 5 controls and the other 19 varieties and 6 controls. Table 4 gives details of varieties undergoing testing at stage T1.

**Table 4. Varieties planted in 1st Test : T1**

| *Varieties* | **1972** | **1973** | **1974** | **1975** | *Total* |
|---|---|---|---|---|---|
| M 63 | 14 | 13 | — | — | 27 |
| M 64 | — | 9 | 28 | — | 37 |
| M 66 | — | — | — | 37 | 37 |
| Foreign | 4 | 8 | — | 2 | 14 |
| *Total* | *18* | *30* | *28* | *39* | *115* |
| No. of series | 1 | 2 | 2 | 2 | 7 |
| No. of trials | 4 | 8 | 8 | 8 | 28 |

* A flow chart depicting the final phase of testing and multiplying varieties is given in the Annual Report for 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 and 6 controls. Table 5 gives details of varieties undergoing testing at stage T2.

**Table 5. Varieties planted in 2nd Test : T2**

| *Varieties* | 1972 | 1973 | 1974 | 1975 | *Total* |
|---|---|---|---|---|---|
| M 60 | 2 | — | — | — | 2 |
| M 61 | 4 | 1 | 1 | — | 6 |
| M 62 | 1 | 8 | 3 | — | 12 |
| M 63 | — | — | 2 | 5 | 7 |
| M 64 | — | — | — | 5 | 5 |
| Foreign | 2 | 1 | 4 | — | 7 |
| *Total* | *9* | *10* | *10* | *10* | *39* |
| No. of series | 1 | 1 | 1 | 1 | 4 |
| No. of trials | 4 | 4 | 4 | 4 | 16 |

*3rd Testing : T3*

Ten paired trials were planted as usual, one trial of each pair for harvest in the first half of the crop period and the other for harvest in the second half of the crop period. These trials were laid out as randomised blocks of 12 treatments with 3 replicates and they included 4 varieties and 8 controls. 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* | 1972 | 1973 | 1974 | 1975 | *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 | 2 |
| M 62 | — | — | — | 2 | 2 |
| Foreign | — | — | — | 1 | 1 |
| *Total* | *5* | *5* | — | *4* | *14* |
| No. of series | 2 | 2 | — | 2 | 6 |
| No. of trials | 16 | 20 | — | 20 | 56 |

**Table 7. Varieties in the final phase of testing**

| *Varieties* | 1963—1971 | 1972 | 1973 | 1974 | 1975 | *Total* |
|---|---|---|---|---|---|---|
| Planted T1 | — | 18 | 30 | 28 | 39 | 115 |
| Under testing at later stages | 36 | — | — | — | — | 36 |
| *Total* | *36* | *18* | *30* | *28* | *39* | *151* |

Trials planted in 1971 at all stages of the final phase of testing were harvested in 3rd ratoon. They included only the T1 and T2 stages. A summary of results is presented in Table 8.

**Table 8. Varieties planted in 1971 at the final phase and harvested in 3rd ratoon**

| | |
|---|---|
| Varieties planted 1971 | 50 |
| Varieties previously discarded | 4 |
| Varieties discarded | 28 |
| Varieties released 1975 | 0 |
| Varieties still under selection | 18 |

**Varieties still under selection**

| *Varieties* | *Parents* | | | *Gumming Disease rating** | *T1* | *T2* | *T3* | *M4* | *M5* |
|---|---|---|---|---|---|---|---|---|---|
| M 1453/59 | N Co 310 | x | M 147/44 | O | 69 | 71 | 73 | 72 | 73 |
| M 555/60 | M 241/40 | x | M 213/40 | O | 69 | 71 | 73 | 72 | 73 |
| M 861/60 | N Co 376 | x | M 423/41 | P | 69 | 71 | 73 | 72 | |
| M 907/61 | M 202/46 | x | R 47 2777 | O | 69 | 69 | 70 | 72 | |
| ,, | | | | | | 71 | 73 | 74 | |
| M 1595/61 | N Co 376 | x | M 307/57 | P | 71 | 73 | 75 | 74 | 75 |
| M 574/62 | Co 779 | x | M 147/44 | P | 71 | 73 | 75 | 74 | 75 |
| M 986/62 | M 146/56 | x | M 196/31 | P | 71 | 74 | | | |
| M 1227/62 | M 311/41 | x | POJ 3016 | O | 71 | 73 | 75 | 74 | 75 |
| M 1572/62 | M 117/55 | x | R 47 2777 | P | 71 | 74 | | | |
| M 1713/62 | N Co 376 | x | M 147/44 | P | 71 | 73 | | | |
| M 1951/62 | N Co 376 | x | M 147/44 | P | 71 | 73 | | | |
| M 1955/62 | N Co 376 | x | M 147/44 | P | 71 | 73 | | 75 | |
| M 2206/62 | N Co 376 | x | M 147/44 | O | 71 | 74 | | | |
| M 2207/62 | N Co 376 | x | M 147/44 | P | 71 | 73 | | 75 | |
| M 2370/62 | N Co 376 | x | M 147/44 | O | 71 | 73 | | 74 | 75 |
| M 2526/62 | N Co 376 | x | M 196/31 | P | 71 | 73 | | | |
| H 47 4991 | H 40 3966 | x | Unknown | P | 71 | 74 | | | |
| H 48 3166 | H 40 729 | x | Unknown | P | 71 | 74 | | | |

Years planted: T1, T2, T3, M4, M5.

*O = Indications of susceptibility : reaction of variety needs confirmation.
P = No indications of susceptiiblity

**Varieties discarded**

| | | |
|---|---|---|
| M 461/54 | M 90/60 | M 1945/62 |
| M 146/55 | M 702/60 | M 2217/62 |
| M 259/55 | M 282/62 | M 2468/62 |
| M 40/57 | M 480/62 | M 2494/62 |
| M 379/57 | M 514/62 | M 2550/62 |
| M 537/57 | M 779/62 | B 52107 |
| M 9/58 | M 839/62 | |
| M 64/58 | M 844/62 | |
| M 145/59 | M 1567/62 | |
| M 662/59 | M 1786/62 | |
| M 738/59 | M 1800/62 | |

**Release of varieties**

The Cane Release Committee met on December 15th to consider the performance of varieties planted in M5 nurseries. Eight varieties were considered for release but it was decided to release none of them as their performance in 1975 had been affected by cyclones *Gervaise* and *Inès*.

**Approved cane varieties**

The cane varieties officially proclaimed for commercial cultivation as at 31st December, 1975 are as follows :

| *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 (*1975*) | 18. 2.64 |
| 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 |
| NCo 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.

**Miscellaneous**

The new computer (Plate II) was commissioned on June 23rd and in spite of initial teething troubles, all data relevant to plant breeding, including results of the final phase, were processed on it. It soon became evident that the 8K core store was inadequate and it was decided to enhance the system to 16K.

**Cane quarantine and export of varieties**

A new quarantine cycle was started in September with the following cane varieties.

| *Country of origin* | | *Variety* |
|---|---|---|
| South Africa | (3) | 66 W 1437, N 65-1542, N 9 |
| Réunion | (8) | R 540, R 565, R 567, RP 341/65, RP 99/66, RP 119/66, RP 347/67, CRA 60/26 |
| Australia (CSR) | (4) | MQ 33-371, Demos, Hebe, Apollo |
| (Queensland) | (5) | Q 63, Q 90, Q 96, Q 97, Q 98 |
| Hawaii | (4) | H 57-5026, H 58-4392, H 60-5657, H 65-2857 |
| Taïwan | (5) | F 156, F 168, F 169, F 170, F 171 |
| USA | (6) | CP 65-357, CP 67-412, CP 68-1026, CP 68-1067, PB 52-1-1, US 1694 |
| India | (3) | Co 270, Co 312, Co 1287 |

Forty-one varieties were distributed to the following countries : Kenya (4), Malaysia (3), Taïwan (10), Pakistan (1), France (7), Zambia (6), Réunion (10).

## AGRONOMY AND PLANT PHYSIOLOGY

### Plant Nutrition

*Rates of fertilization*

Fertilizer rates recommended to planters are those that give maximum profit. The main factors governing profit are the price of sugar and the cost of fertilizers.

Fluctuation in both factors in recent years led to revisions in rates of fertilizer application that frequantly were not in the national interest. It was, therefore, felt that some degree of stability was desirable and the Government's decision to subsidize the cost of fertilizers as from 1st October, 1975, was very welcome. The object of the substantial decrease of price, in the order of 30-40% for some fertilizers, was to encourage planters to use sufficient fertilizers but cheaper fertilizers also make higher rates of fertilization profitable and will result in an increase in the national production of sugar. Following the subsidy, recommendations to increase rates of fertilization were made to the planting community.

*Field trials*

Cyclone *Gervaise* played havoc with field experiments and the damage suffered by the cane precluded the acquisition of data on cane yield in all field trials on plant nutrition.

*Fertilizer application after a cyclone*

Depending upon the severity of wind damage and the time of year, past policy has been to recommend the application of nitrogen after the passage of a cyclone to boost recovery of cane growth. There was, however, no experimental basis for this practice. Trials were therefore laid down in March-April, 1-2 months after cyclone *Gervaise*, with treatment plots receiving 100 kg of sulphate of ammonia. The trials were harvested either early or late.

Results were erratic and failed to show that the cane had benefited from the application of fertilizer (Table 9). Owing to the high cœfficient of variation observed in these trials, future trials will have to be designed to assess the significance of small yield differences.

**Table 9. Effect of supplementary nitrogen (240 kg sulphate of ammonia/ha) applied after cyclone Gervaise on cane and sugar yields**

| | EARLY HARVEST | | | | | LATE HARVEST | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | TCH | | TSH | | | TCH | | TSH | |
| | *Variety* | *0 kg* | *240 kg* | *0 kg* | *240 kg* | *Variety* | *0 kg* | *240 kg* | *0 kg* | *240 kg* |
| Rose - Belle | S 17 | 38.4 | 39.3 | 4.46 | 4.65 | M 93/48 | 55.7 | 56.4 | 5.40 | 5.24 |
| Britannia | S 17 | 68.5 | 69.4 | 7.80 | 7.37 | — | — | — | — | — |
| Hermitage | S 17 | 42.9 | 50.0 | 4.29 | 4.60 | M 377/56 | 53.3 | 51.7 | 5.69 | 5.88 |
| Union Vale | S 17 | 53.3 | 50.2 | 7.09 | 6.54 | S 17 | 54.0 | 57.1 | 7.23 | 7.58 |
| Beau Bois | S 17 | 65.4 | 64·4 | 5.88 | 5.55 | M 124/59 | 28.4 | 31.3 | 3.08 | 3.41 |
| Mon Loisir | M 13/56 | 58.1 | 70.9 | 6.04 | 7.73 | M 377/56 | 70.6 | 70.2 | 7.75 | 7.73 |
| F.U.E.L. | M 438/59 | 51.4 | 54.3 | 4.53 | 4.79 | M 93/48 | 48.6 | 51.7 | 4.50 | 4.76 |
| Riche-en-Eau | S 17 | 54.7 | 51.9 | 6.23 | 5.93 | M 124/59 | 72.5 | 71.8 | — | — |
| St. Aubin | S 17 | 59.5 | 62.8 | 6.90 | 6.92 | S 17 | 56.9 | 51.4 | 6.55 | 5.66 |
| Savannah | M 13/56 | 75.4 | 75.6 | 6.56 | 6.42 | M 13/56 | 43.6 | 48.3 | 3.93 | 4.29 |
| Mount | M 438/59 | 74.4 | 75.4 | 6.71 | 6.11 | — | — | — | — | — |
| Belle Vue | S 17 | 56.9 | 55.7 | 5.97 | 6.00 | — | — | — | — | — |
| Mean | | 58.2 | 60.1 | 6.04 | 6.05 | | 53.7 | 54.4 | 5.52 | 5.56 |

*Potassium*

The role of organic matter on the fate of potassium in local soils was studied. Samples of soils were freed of organic matter and then analysed for extractable ($HNO_3$ method) and exchangeable ($NH_4OAC$ method) potassium. The results were compared with those obtained from soils with organic matter still present. In general, organic matter contained only about 14% of the extractable, but 92% of the exchangeable, potassium.

*Silicon*

Recommendations concerning application of silicate are based on the amount of Truog-extractable Si in the soils concerned. Tests were made to determine if the Truog-extractable Si in acid soils is affected by application of coral sand or lime. It was found that the index of Truog-extractable Si in Humic Ferruginous Latosols rises curvilinearly with pH above 6.5 but is unaffected when pH is lower.

*Sulphur*

Soil, leaf and sheath samples were taken from trials comparing sulphate of ammonia and calcium ammonium nitrate.

Correlation tests showed that soil acetate-soluble sulphate was significantly correlated with sheath sulphur (5% level, $v = 0.424$, d.f. $= 28$) but no significant relationship was obtained either between soil sulphur and leaf sulphur or between leaf sulphur and sheath sulphur.

The amount of sulphur removed in a cane crop (tops and stalks) ranged from 0.1 to 0.5 kg per tonne of cane, the millable cane generally removing about 0.2 kg per tonne cane and the tops about 0.1 kg per tonne cane (Table 10).

**Table 10. Sulphur exported by sugar cane at harvest — 1971 series**
*(canes harvested in 1974)*

| *Trial no.* | *Locality* | *Soil family* | *Variety* | *kg S per tonne* | |
|---|---|---|---|---|---|
| | | | | *Stalks* | *Tops* |
| 11/71 | S. Souci | $F_2$ | M 93/48 | 0.13 | 0.06 |
| 12/71 | B. Veine | $H_2$ | M 93/48 | 0.15 | 0.07 |
| 13/71 | Ebène | $L_3$ | S 17 | 0.23 | 0.12 |
| 14/71 | N. Grove | $B_1$ | M 93/48 | 0.16 | 0.12 |
| 15/71 | Riche Bois | $F_1$ | S 17 | 0.38 | 0.13 |
| 16/71 | U. Park | $F_2$ | M 93/48 | 0.06 | 0.06 |
| 17/71 | B. Climat | $B_1$ | M 93/48 | 0.17 | 0.08 |
| 18/71 | St. Antoine | $P_3$ | S 17 | 0.33 | 0.09 |

*Soil acidity*

The nature of soil acidity in local soils, particularly the Latosolic Brown Forest soils, is being investigated to improve recommendations on liming.

The results to date indicate that N KCl-extractable Al in Latosolic Brown Forest soils rarely exceeds 2 m.e./100 g soil. As expected, it decreases with increasing pH to a constant minimum value of 0.12 m.e./100 g of soil at a pH of 6.0. Titration of KCl extracts with a base was found to give too high a value for total acidity since conductance measurements showed that the $H_30^+$ in the extract did not come from exchange sites but rather from the hydrolytic reaction of Al.

*Soil organic matter*

Studies were begun to determine if the addition of organic matter to certain soils will remedy their apparent loss of fertility from continuous cane cropping. A compost heap was prepared from a mixture of bagasse (90 tonnes fresh weight), scums (90 tonnes fresh weight) and COFUNA Special Bagasse (20 tonnes fresh weight), the last being a rich mixture of anaerobic spores and cellulolytic and nitrogen-fixing microorganisms specifically prepared for bagasse by the *Compagnie Française des Fumures Naturelles*, France. The compost is to be tried next year in field trials.

*Effect of fertilizer and date of harvest on sugar yields*

The two trials laid down in 1973 with variety S 17 at St. Aubin and variety M 438/59 at Beau Champ were harvested in spite of the damage caused by cyclone *Gervaise*. In these trials, 3 levels of nitrogen and potassium, and 3 dates of harvest, were included in a 3 × 3 × 3 factorial design.

Date of harvest was found to be the dominant factor affecting yield of cane and IRSC in both plant cane and 1st ratoons in both trials. Yield of sugar also responded significantly to date of harvest, except for the 1st ratoon crop at Beau Champ where an increase in IRSC was offset by a decrease in fresh weight of cane from early to late harvest.

The effect of nitrogen and potassium was less marked. IRSC generally decreased with increasing levels of nitrogen in the 1st ratoons; this effect was not observed in plant canes. There was a significant increase in fresh weight of cane due to nitrogen, but yield of sugar responded to nitrogen in the trial at Beau Champ only.

There was no response of IRSC to potassium. However, fresh weight of cane significantly responded to potassium in the trial at Beau Champ where sugar yield also increased with potassium treatment.

*Foliar diagnosis*

Except on some estates, where one leaf sampling had already been carried out, sampling was not done because of cyclone *Gervaise*.

*Soil analysis*

Estate chemists used the Institute's laboratory facilities to determine phosphorus (891 samples) silicon (423 samples), potassium (732 samples) and pH (844 samples) in soils where re-planting was to be carried out.

**Irrigation**

*Overhead irrigation*

Results obtained during the 1975 crop for the three irrigation trials laid down in 1972 were again, as in the 1974 crop, so variable that no conclusions were possible. The erratic results have led to two of these trials being discontinued and new, simpler trials, comparing only two water regimes instead of three, were laid down at Mon Désert-Mon Trésor, St. Antoine and Belle Vue. In addition, an experiment with three water regimes, and using intermediate-pressure, semi-solid sprinkler sets, was initiated at Beaux Songes (Médine S.E.)

*Neutron Probe*

Field calibration of the Neutron Probe acquired in 1974 was completed on a Low Humic Latosol at Tamarin. The calibration curve obtained is given by the equation :

$$y = 1.57x - 0.17$$

where y is the count ratio (counts in soil/counts in water) and x the moisture volume fraction (volume of water per unit volume of soil). A correlation cœfficient of 0.67 ($P = 0.001$) was obtained.

Only readings below 20 cm soil depth were taken for calibrating the probe. A serious drawback of the neutron scattering equipment is the unreliability of its readings in the top 20 cm of soil due to the loss from that layer of fast and thermal neutrons. Reports of the Institute of Hydrology, Wallingford, U.K., indicate that readings within the upper 20 cm of soil can be made using fibre-glass soil trays.

*Drip irrigation*

The trial at Palmyre (L1 soil), Médine S.E., to compare drip irrigation with surface irrigation and to determine the influence of different spacings of cane rows and dripper lines was harvested in first ratoon.

The trial consists of 2 replicates × 5 treatments × 2 varieties, the treatments being as follows:

1. Unirrigated
2. Dripper lines along every cane row, with the rows spaced at the normal 5 ft.
3. Dripper lines in the middle of every alternate interrow, with the rows spaced at 5 ft.
4. Dripper lines in the middle of the 3 ft interrow, with the rows spaced alternately at 3 ft and 7 ft.
5. Surface irrigated.

Irrigation was daily in the drip treatments and fertilizer was applied through the system over 4 months, starting when the cane was about 1 1/2 months old. Surface irrigation was carried out once every 14 to 21 days. Irrigation was stopped one month before harvest. The depth of water applied in the drip treatments was 1406 mm and the estimated depth applied in the 19 surface irrigations was 2172 mm. Precipitation over the season totalled 896 mm.

Results are presented in Table 11. Treatment 2 gave significantly higher cane and sugar yields than all other treatments. Treatments 3 and 4 gave yields that did not differ significantly from each other but their yields were significantly higher than those from treatment 5. Yields from treatment 5 were significantly higher than those from treatment 1. No significant difference was obtained for IRSC. The trial is being continued.

**Table 11. Drip irrigation experiment. Yields in 1st ratoon**

| | *Var. M 13/56* | | | *Var. S 17* | | |
|---|---|---|---|---|---|---|
| *Treatment* | *TCH* | *IRSC* | *TSH* | *TCH* | *IRSC* | *TSH* |
| 1 | 42 | 11.6 | 4.87 | 23* | 12.1* | 2.82* |
| 2 | 125 | 10.6 | 13.19 | 115 | 11.7 | 13.43 |
| 3 | 107 | 10.6 | 11.29 | 106 | 11.5 | 12.22 |
| 4 | 112 | 10.6 | 11.90 | 110 | 11.4 | 12.53 |
| 5 | 85 | 11.2 | 9.44 | 72 | 12.8 | 9.16 |

* Values for this treatment adjusted to take into account one abnormal result

## Sugar cane ripeners

The ripener "Polaris" gave promising results in field plot trials. Response depended on the variety, the time of application, the dosage rate and the interval between harvest and application. A good response was obtained with varieties M 13/56, M 93/48 and S 17 when 4 kg/ha was applied before August and the canes were harvested 9 to 12 weeks after application.

Plate II. The new MSIRI computer.

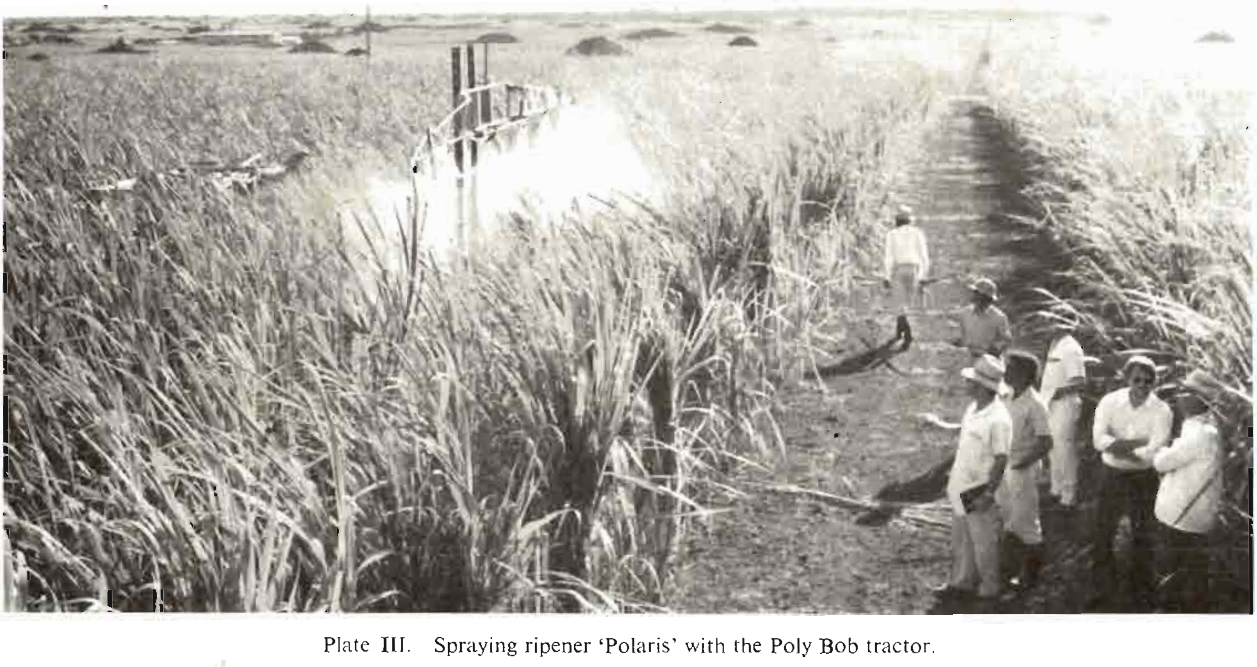


Plate III. Spraying ripener 'Polaris' with the Poly Bob tractor.

The presence of stone heaps and power lines in sugar cane fields and the proximity of villages limit the use of airplanes for industrial application of Polaris in Mauritius: helicopters would be more suitable. In the absence of the latter, the potential of the Poly Bob tractor (Plate III) for industrial application of the ripener was investigated.

The chemical was sprayed at the rate of 4 kg/ha on variety M 13/56 using both the tractor and a knapsack sprayer. Controls comprised no spraying and spraying with water only. Pol % cane was determined on samples removed by hand and also by the core sampler.

The tractor drove easily through the experimental plots, the canes being short as a result of the cyclones, and stalk breakage was relatively low. Variation in volume sprayed by tractor was of the order of 10%. A significant increase in Pol % cane, in plots treated by tractor and by knapsack-sprayer, was shown by samples taken by hand and was partly confirmed by core samples (Table 12). Treatments had no significant effect on fresh weight yield.

**Table 12. Effect of ripener "Polaris" on Pol % cane of variety M 13/56**

| *Treatment* | | *Core sample* | *Manual sample* |
|---|---|---|---|
| No spraying | | 14.74 | 13.14 |
| Poly Bob. No spraying | | 14.37 | 12.82 |
| Poly Bob. Water | | 14.81 | 12.91 |
| Knapsack. Water | | 14.30 | 12.92 |
| Poly Bob. 4 kg/ha Polaris | | 14.37 | 13.59** |
| Knapsack. 4 kg/ha Polaris | | 15.07* | 13.77** |
| LSD | 0.05 | 0.63 | 0.27 |
| | 0.01 | | 0.36 |
| | 0.001 | | 0.47 |

* Significantly different from control (knapsack water) at P = 0.05
** Significantly different from controls (Poly Bob water, Knapsack water) at P = 0.001

Further trials on a large scale involving the use of helicopters or fixed-wing aircraft are necessary before recommendations for the industrial application of the ripener can be made.

**Physiology of flowering**

In 1973, the relationship between flowering and yield was studied in the plant cane crop of varieties M 351/57 and S 17 in a single environment. It was concluded that flowering had no adverse effects on yield even when harvest was delayed to November.

To elaborate on previous studies, four experiments had been laid down in 1974 with the same varieties but in two contrasting environments (Réduit and Belle Rive). Three ages of crop at induction, resulting from different planting dates, were also included as a factor in the experiments. Owing to cyclone *Gervaise*, inhibition of flowering by the use of night breaks, as planned, was not possible but naturally vegetative and flowering stalks were compared when the experimental plots were sampled at a constant age of 64 weeks in July, September and November.

Irrespective of harvest date, flowered stalks were heavier than vegetative stalks for both varieties in both environments. For M 351/57 at Belle Rive, however, the difference between flowered and vegetative stalks was at no time significant (Fig. 7). Flowered stalks generally had a slightly higher pol % cane, this being more pronounced for variety M 351/57 in November at both sites. Also, irrespective of harvest date, flowered stalks yielded more sugar than vegetative stalks in both varieties in both environments; this difference was less pronounced the later the harvest. At Belle Rive the difference was not significant for variety M 351/57. No difference in dry matter % cane was evident between the two types of stalks in any of the experiments and consequently the differences in dry matter production were similar to those of fresh wieght. Partitioning of dry matter into fibre and sucrose was in favour of the latter in flowered stalks while in vegetative stalks partitioning was equal.

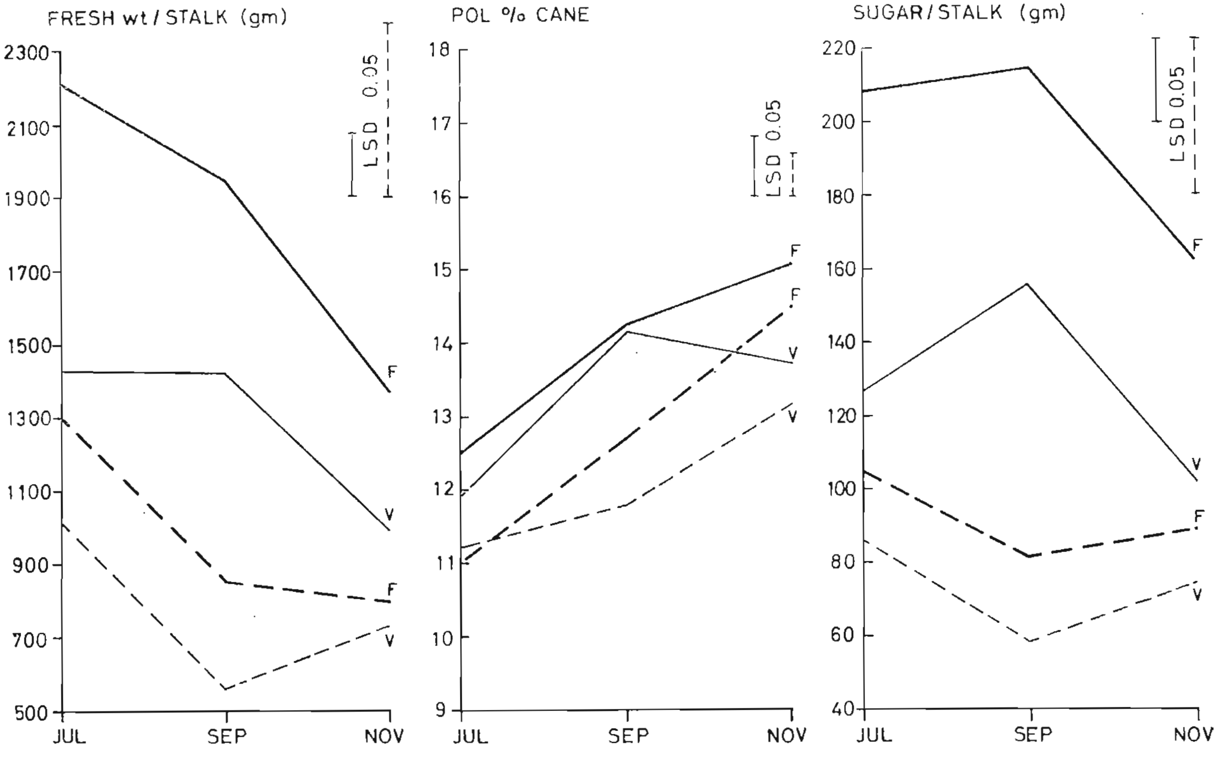



Fig. 7. Fresh weight, Pol % cane, and sugar/stalk of flowering and vegetative shoots of variety M 351/57 grown in two contrasting environments. F — flowering, V — vegetative, line — Réduit, dash — Belle Rive.

In 1976, the experiments are to be repeated as planned originally with vegetative stalks produced artificially by photoperiodic treatments compared to naturally-flowering stalks in the first ratoon crop.

**Physiology of growth**

To study the adaptability to environment of commercial sugar cane varieties, three trials were laid down in contrasting environments, viz : Pamplemousses, Trianon and Alma. The trials included four varieties (M 93/48, M 13/56, M 351/57 and S 17), and four planting dates (H1 — March 5; H2 — April 30; H3 — June 25; H4 — August 20) in a factorial design. For the plant cane crop the plots were harvested at a fixed age giving four equally spaced harvest dates (H1 — June 24; H2 — August 14; H3 — October 14; H4 — December 9).

The varietal main effect for sugar yield indicated that one variety in each environment outyielded the others. These were M 13/56, S 17 and M 93/48 at Pamplemousses, Trianon and Alma, respectively. The performance of M 13/56 at Pamplemousses is explained by a high fresh weight yield and a moderate sucrose content at harvest whilst at Alma the superiority of M 93/48 was due to both a high sucrose content and a high fresh weight yield at harvest. At these two sites, the mean fresh weight per tiller at harvest for M 93/48 was significantly higher than for M 13/56 but at both sites the latter variety had significantly more tillers. At Trianon, the superiority of S 17 was mainly due to its significantly higher sucrose content at all harvest dates, its fresh weight yield being similar to that of the other varieties.

The harvest date main effects (Fig. 8) followed a similar trend at Pamplemousses and Alma where a significant increase in sugar yield occurred from the June to August harvest and a significant drop from the October to the December harvest. For both sites, the increase in sugar yield was mainly due to a significant increase in sucrose content whilst the drop in sugar yield late in the harvest season was due to a significant decrease in fresh weight yield. At Pamplemousses, the drop in fresh weight yield at later harvests was due to a reduced number of tillers; the mean fresh weight

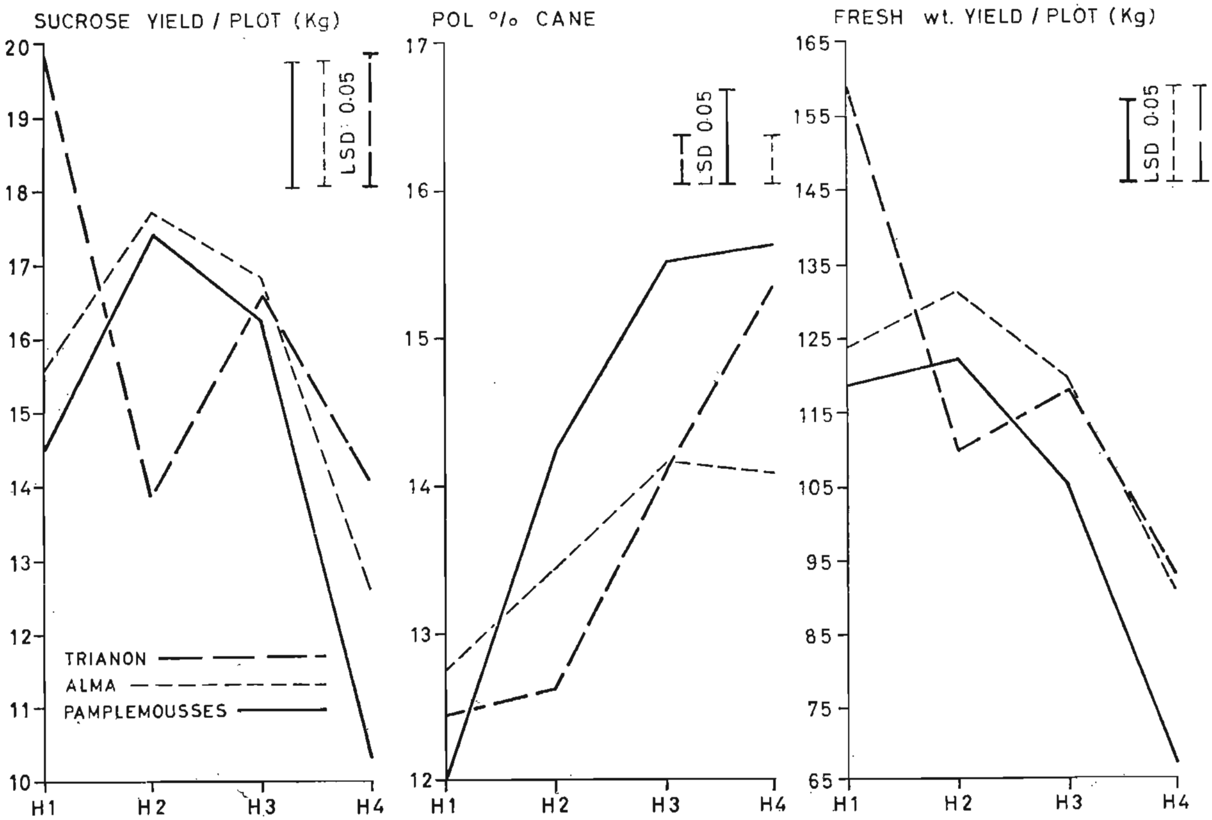



Fig. 8. Main effect of time of harvest on sugar/plot, pol % cane, and fresh weight of varieties M 93/48, M 13/56, M 351/57, and S 17 grown in three contrasting environments (Graphs represent means of the four varieties).

per tiller remained stable throughout the harvest season (Fig. 9). At Trianon, the significantly low sugar yields for the August and December harvests were mainly due to low fresh weight yield, this being explained only by a significantly lower number of tillers reaching harvest in December.

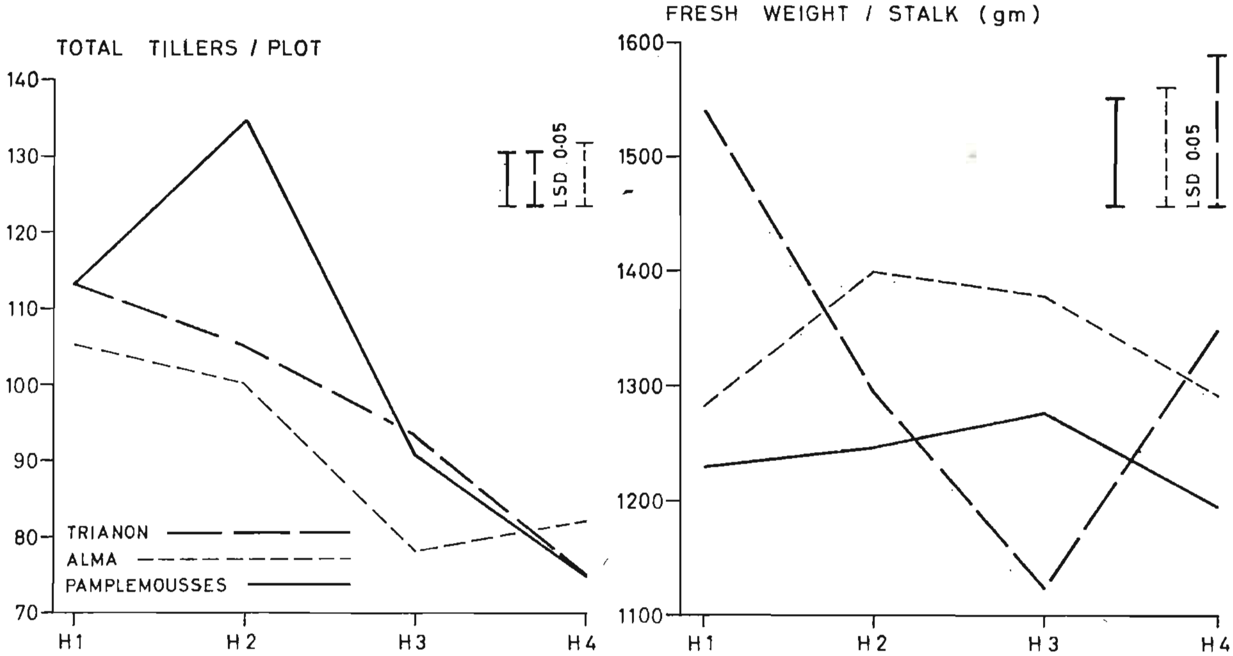



Fig. 9. Main effect of time of harvest on total tillers and fresh weight per stalk of varieties M 93/48, M 13/56, M 351/57, and S 17 grown in three contrasting environments (Graphs represent means of the four varieties).

The above data indicate that the yield of sugar at harvest within and between environments is primarily dependent upon the harvest date and to some extent on the variety grown. In all environments, the sucrose content increased from June to October and sometimes even later. The trend was the other way for the fresh weight component, mainly because of fewer tillers reaching harvest later in the crop season. The mean fresh weight per tiller component was maximal around October. A given variety may achieve high fresh weight yield at harvest through a combination of a high number of tillers with a low mean fresh weight per tiller or vice versa (e.g. variety M 13/56 at Pamplemousses, variety M 93/48 at Trianon and Alma).

The variety x harvest-date interaction was significant only at Alma and is not discussed here. All interactions mentioned as well as data on tiller production and survival and on accumulation and partitioning of dry matter up to harvest for both the plant cane and ratoon crops will be considered in greater detail elsewhere.

## DISEASES

### Disease situation and control

The two severe cyclones early in the year and the following dry spell caused a recrudescence of some of the most troublesome of sugar cane diseases.

Gumming disease was severe in a number of fields of M 377/56; systemic infection was not uncommon at Nouvelle Industrie, Ferney, Queen Victoria and Riche en Eau, and was also observed in a few fields planted after the cyclones. On the whole, however, the situation was satisfactory and certain areas found infected in the past were free from the disease, no doubt the result of the campaign for the removal of infected M 147/44 and the restriction imposed on the planting of M 377/56. The following recommendations were made to strengthen the sanitary measures necessary to maintain the high yielding but susceptible M 377/56 in cultivation: (i) the uprooting of severely infected fields, (ii) the restricted planting of the variety after a cyclone in regions where the disease is most prevalent, (iii) the acquisition of planting material from healthy fields and (iv) the roguing of stools showing systemic infection in young fields planted in 1975.

Leaf scald was often observed in fields of M 13/56 and S 17, and death of diseased stalks occurred in one field of the latter variety. A few of the new varieties in M 4 and M 5 nurseries were also affected.

Smut was detected in a few fields of M 377/56 in the North, where the disease has not been observed in commercial plantings for several years. Field surveys showed the level of infection to be low in most fields, although two had about 7% overall infection (about 1547 smut whips per hectare) and about 30% infected stools. Extensive roguing was carried out and badly infected fields will be uprooted after the 1976 harvest. Two varieties in M 4 and M 5 were also affected.

Wilt disease was severe in several fields of variety M 438/59. A general yellowing of leaves in many fields of variety S 17 after the cyclones was probably physiological and not due to the disease.

Some estates adopted Benlate for the treatment of cane setts against pineapple disease, using it as a cold dip treatment at the planting site or incorporating it in the hot water treatment. Assistance was given to estates in monitoring the fungicide concentration if they used the latter method.

Seven hectares of RSD-free A nurseries were established on estates and 400 hectares of B nurseries were planted. Of the B nurseries, 16% was planted with material from RSD-free nurseries.

**Table 13. Results of gumming resistance trials in 1975**

| *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 | 2896 | 0.2 | 3.8 | 79.9 | 16.1 |
| III*** | 1st Multiplication | 40 | 0 | 15.0 | 82.5 | 2.5 |

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

### Disease resistance trials

*Gumming*

The gumming trials (Table 13) were affected by adverse weather. The two cyclones delayed inoculation with the result that infection was low when the surveys were carried out. The trial for the second testing stage was gappy because of drought at planting and had to be abandoned.

Selecting for resistance at the first stage, which had been tried for five years, was abandoned because it has proved inefficient. The discards over the five years amounted to only 2.9%, 6.3%, 0.8%, < 0.1% and 0.2%, respectively.

*Leaf scald*

The resistance trial established in 1972 was re-inoculated in second ratoon. Results obtained in the second surveys, about two months after inoculation, have been consistent, except for a few varieties, over the three years and show good correlation with field reaction for the standards (Table 14). The first surveys, one month after inoculation, when only leaf infection is recorded, have given poor correlation. Also, uninoculated rows have not proved useful because they have shown little natural infection.

**Table 14. Reaction of varieties to leaf scald disease in a trial over three successive years**

| *Variety* | *Infection %* | | | |
|---|---|---|---|---|
| | *1973* | *1974* | *1975* | *Mean* |
| M 124/59 | 48.1 | 51.4 | 25.0 | 41.5 |
| M 555/60 | 41.3 | 63.6 | 28.6 | 41.2 |
| B 6103 | 43.6 | 49.3 | 28.4 | 40.4 |
| H 371933 | 47.9 | 49.5 | 19.5 | 39.0 |
| M 202/46* | 39.8 | 47.8 | 15.5 | 34.4 |
| S 17* | 35.6 | 42.1 | 24.0 | 33.9 |
| Phil 53-33 | 42.7 | 34.8 | 14.4 | 30.6 |
| M 907/61 | 37.4 | 19.6 | 21.4 | 26.1 |
| M 496/59 | 27.7 | 43.2 | 7.0 | 26.0 |
| M 1453/59 | 20.9 | 50.7 | 6.0 | 25.9 |
| M 13/56* | 22.5 | 39.1 | 14.8 | 25.5 |
| M 861/60 | 19.0 | 24.8 | 5.8 | 16.2 |
| M 31/45* | 15.2 | 21.9 | 9.1 | 15.4 |
| B 4906 | 29.9 | 2.0 | 0 | 10.7 |
| M 1189/61 | 16.9 | 6.6 | 7.1 | 10.2 |
| M 335/51 | 11.9 | 13.3 | 4.5 | 9.9 |
| PR 1059 | 10.2 | 5.3 | 8.7 | 8.1 |
| F 146 | 6.4 | 12.2 | 4.1 | 7.6 |
| M 93/48* | 9.5 | 1.3 | 4.8 | 5.2 |
| M 438/59 | 6.3 | 3.9 | 1.4 | 3.9 |
| M 260/59 | 1.9 | 3.6 | 2.0 | 2.5 |

* Standards : M 202/46 = Highly susceptible (8/9)**
S. 17 = Susceptible (7)
M 13/56 = Moderately susceptible (5)
M 31/45, M 93/48 = Resistant (2/3)

** ISSCT rating

The high relative susceptibility of the recently released variety M 124/59, hitherto rated slightly susceptible, and that of M 555/60, which is now in M 5 nurseries, is to be noted. Variety M 1453/59, which showed moderate susceptibility, was found infected to the extent of 25% in an M 5 nursery. Field observations indicate that it is tolerant to the disease.

A trial established in 1974 was inoculated in plant cane. Of eleven varieties under test, only one showed susceptibility.

*Smut*

Smut observation plots have been established annually since 1971 to assess the reaction of new varieties to the disease. Infection of the varieties under test is by natural means from inoculated rows of a susceptible contaminant. Disease uptake and expression is low in the plant crop but increases in ratoons. Thus, of twenty eight varieties established in 1973, only one showed susceptibility in the plant crop but thirteen showed infection in 1st ratoon, five of which were rated susceptible to highly susceptible and five moderately susceptible. Of forty varieties in plant crop in 1975, two showed susceptibility.

*Yellow spot*

Assessment of varietal reaction to yellow spot in the observation plot in the superhumid zone has been found to be more accurate in ratoon than in plant cane. Of 26 varieties assessed in 1975, 15 were resistant to highly resistant, 6 susceptible to highly susceptible, and the rest of intermediate reaction.

**Specific investigations**

*Ratoon stunting disease*

Typical symptoms of RSD are uncommon in commercial varieties in Mauritius and losses due to the disease cannot be easily demonstrated. As such symptoms have been detected frequently in unthrifty canes of variety M 438/59, and following reports of the close association of a coryneform bacterium with RSD in Australia, research on the disease and on assessment of its importance under local conditions was resumed.

Attempts were made to detect the presence of the bacterium reported in diseased canes, using the technique described in Australia. This involves leaving sliced diseased tissues in water for the bacteria to diffuse out of the cells. The diffusates are centrifuged and the sediment examined by dark field and by electron microscopy. The facilities provided to a member of the staff for this work at the Department of Biological Sciences, University of Exeter, England, are gratefully acknowledged.

Bacteria very similar to those reported in Australia and Taïwan were observed in all stalks of M 438/59 showing typical nodal symptoms of the disease and also in two other varieties (Plate IV). They are characterized by their shape, their size ($1.0 - 2.6\ \mu \times 0.13 - 0.26\ \mu$), and by the presence of coiled mesosomes. The bacteria were obtained from nodes, internodes and leaves of mature stalks as well as from young tillers but they were absent from canes grown from cuttings that had received the long hot water treatment and from canes showing the vascular discoloration of chlorotic streak, gumming and leaf scald diseases.

Electron microscopy was essential to ascertain the similarity of the bacterium observed with that reported in Australia but routine examinations proved possible with the light microscope, the bacterium being distinguishable by its peculiar size and shapes (filiform rod, curved, S and L — shaped.

Although appearing to be constantly associated with RSD, the role of the bacterium in the etiology of the disease remains to be shown. In Mauritius at least, its association with yield reduction has to be demonstrated. The long hot water treatment applied to M 438/59 causes disappearance of visual symptoms but early growth is no better than that from untreated cuttings showing disease symptoms.

A field experiment has been laid down to assess yield loss due to RSD in M 438/59 and M 514/62, the two varieties that show the disease symptoms best in Mauritius.

Inoculations of juice from diseased cane stalks into the grass *Pennisetum purpureum*, according to a method used for disease detection in Brazil, did not give good results. The bacterium could not be obtained from the inoculated grass.

Trials established since 1973 to compare the effects of the long and the short hot water treatment and to elucidate if there is any combined effect of RSD and chlorotic streak on cane growth given any results to date.

*Leaf scald*

The detection of latent infection with leaf scald disease is important in cane quarantine and for research on the disease. A method involving macerating cane tissue in water, centrifuging the exudate and inoculating the sediment into a susceptible variety has shown promise and its reliability is being assessed.

*Streak*

Serological studies were carried out to determine the relationship between the local and the East African strains of the streak virus infecting cane. Antisera for the maize, cane and *Panicum* strains of the virus in Kenya were kindly supplied by Dr. K. Bock of the U.K. Overseas Development Administration. The agar gel diffusion technique was adopted using crude extracts from infected leaves for the virus antigens. No reaction was obtained between the local cane antigen and any of the antisera. In a test where several strains of the virus were inoculated into *Cenchrus*, which develops severe symptoms with all the local strains, the result was still negative for the cane strain while reaction with some other strains was positive (see maize section in this report).

These results agree with those of transmission tests carried out in 1974, which indicated that the local cane strain of the virus might be different from the one in Africa. The lack of serological relationship needs further elucidation.

*Effect of Dithane M-45 on cane growth*

No significant differences in growth and yield in the plant crop and in tillering after harvest were observed in the experiment laid down in 1974 to study the effect on cane growth of high dosages of Dithane M-45 applied to potatoes grown in interrows of the cane. Some of the plots had received a total of as much as 75 kg/ha of Dithane M-45 during the three and a half months of potato cropping. Potatoes were grown again in the first ratoon and the same fungicide treatments applied in the same plots to assess effect on yields in the first ratoon.

## PESTS

**The stem borer** (*Chilo sacchariphagus*)

Owing to cyclone *Gervaise*, the acquisition of data on population dynamics in selected fields during the 1974-75 crop had to be abandoned in February. For the same reason, further investigations to obtain a reliable method of estimating borer damage to canes at harvest-time had to be postponed.

*Sex pheromones*

Work on the sex pheromone of *Chilo sacchariphagus* was started with the cooperation of the Tropical Products Institute, London. Sex pheromones are chemicals emitted by individuals to attract and condition the sexual behaviour of the opposite sex and they are an essential factor in

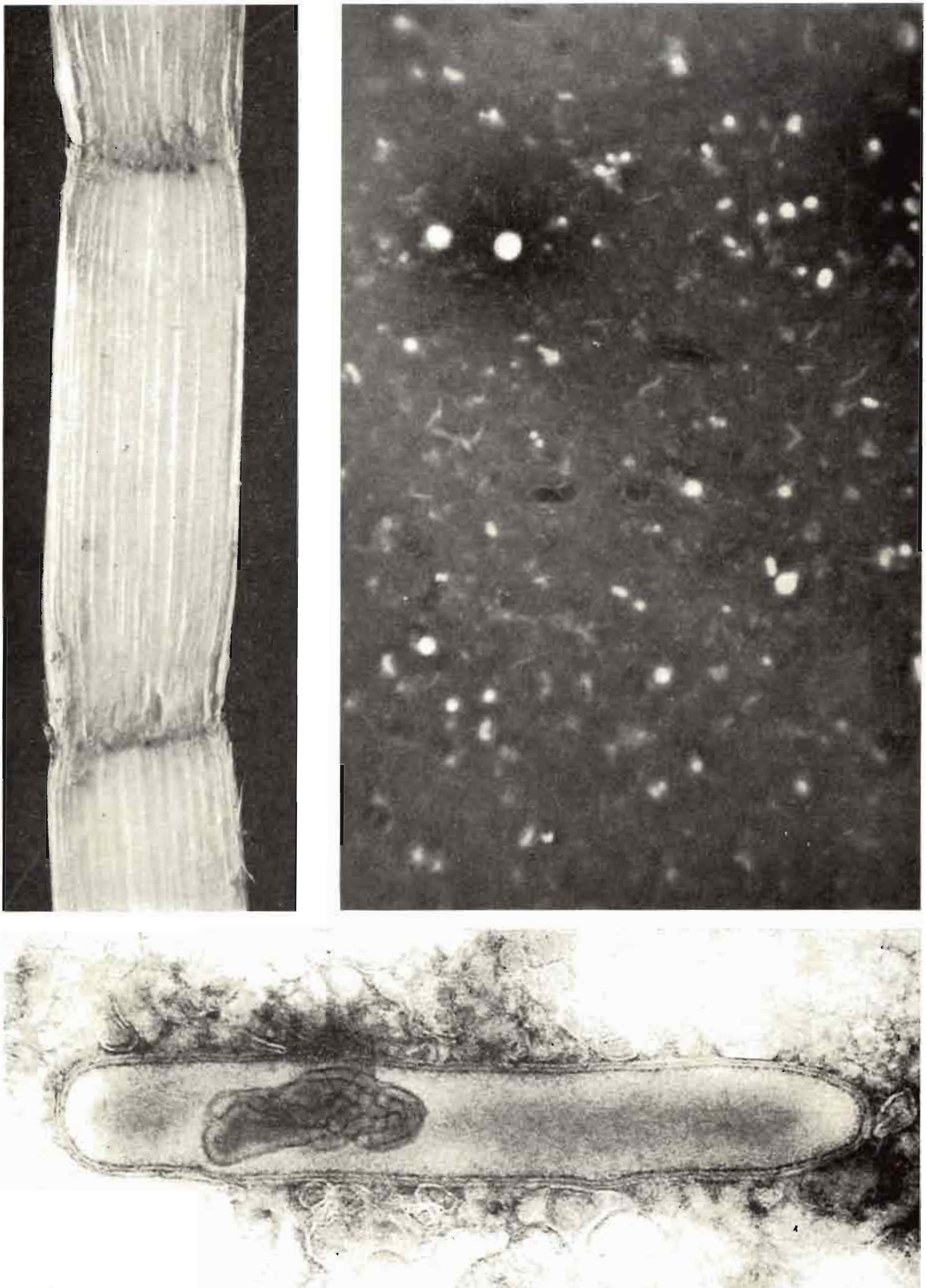


Plate IV. Ratoon stunting disease. *Top, left*; Nodal symptoms in var. M438/59. *Top, right*; Phase contrast micrograph of bacteria from diseased plants. *Bottom*; Electron micrograph of bacterial cell.

Plate V. *Top*; Adults of *Aphytis* sp., a parasite of *Aulacaspis tegalensis* introduced from Java. Actual size about 1.0 mm long. *Bottom*; Water-trap used with sex pheromone of *Chilo sacchariphagus* the reproduction of many insect species. They are commonly called sex attractants because one or more of the components of a pheromone are often instrumental in attracting the opposite sex (usually the males) over considerable distances. The ultimate aim of the work now in progress is the use of synthetic pheromone components in the field to control *C. sacchariphagus* by suppressing mating.

Several consignments of pupae were sent by air to the Tropical Products Institute where freshly-emerged moths were needed for chemical determination of the female pheromone. Progress was made with the identification of the attractive components of the pheromone and towards the end of the year synthetic compounds were received for testing their attractiveness to male moths in the field. The synthetic pheromone components were received in sealed polythene vials, through the walls of which the chemicals diffuse on exposure to air at ambient temperatures. These vials were exposed in the field by attaching them to the underside of the lids of specially designed water-traps (Plate V). Traps baited with fresh virgin females confined in mini-cages and empty traps (with neither vials nor females) were used as controls. The first trapping experiments were made in December in two localities and the results, that is, the catches of males, showed the vials to be attractive, though apparently not as attractive as the female moths, while the empty traps, as expected, caught no moths. These early results are encouraging but much further work is required both with identification of pheromone components and with field testing of synthetic components.

*Borer damage and wind breakage*

It is common observation that canes often snap easily at a point where borer damage has occurred and it has generally been held that bored canes suffer most from wind breakage. After the passage of cyclone *Gervaise* over Mauritius on February 6-7, a study was made of wind breakage in relation to borer injuries.

The results of the study showed, surprisingly, that there is no evidence of borer damage in Mauritian cane fields being an important factor in cane breakage during strong cyclonic winds. While not providing reason to deny that borer injuries could, on occasion, augment wind breakage, the data obtained and other considerations show the error of believing that such injuries normally augment breakage. The circumstances prevailing during the cyclone season are, in fact, such that little correlation is to be expected between wind breakage and incidence of bored canes.

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

*Introduction of* Aphytis *sp. from Java*

In pursuance of biological control work against the scale insect, Dr. Williams went to Java in July to collect a parasitic micro-hymenopteran of the genus *Aphytis* (Aphelinidae). The parasite in question (Plate V) had been first reported from *A. tegalensis*, and also from the very similar *A. madiunensis*, in 1972 by Dr. D.J. Greathead of the Commonwealth Institute of Biological Control during a survey of the natural enemies of *Aulacaspis* spp. on sugar cane in Java.

The parasite was found in adequate numbers for collection near Semarang in Central Java, where a few fields of sugar cane were slightly infested by *A. madiunensis*. Some 550 pupae were collected over several days and immediately carried back to Mauritius. Emergence and death of adults in transit nevertheless caused some loss of material but over 300 living adults were obtained in Mauritius to start a laboratory culture. The task of finding and collecting the parasite in Java was greatly facilitated by the ready cooperation of the Indonesian Sugar Experiment Station, Pasuruan, and the management of Sragi Sugar Factory: the aid of these organisations and particularly that of Ir. Baril Laoh and Ir. Bœdijono, Director and Entomologist, respectively, of the Experiment Station, is gratefully acknowledged.

Laboratory breeding of *Aphytis*, started in July, was continuing at the end of the year with the intention of releasing the parasite in large numbers during January-May 1976, the months when scale insect appears in most plantations. However, about 145 000 had been released by the end of the year under review.

*Parasite surveys*

Parasitism of scale insect in the field was studied to assess the relative abundance of the different species and to determine the fate of the species introduced in recent years. The method adopted was to collect "mummified" scale insects (i.e. scale insects with symptoms induced by endoparasitism) and to retain them in vials for emergence of adult parasites. Results are given in Table 15. During the collection of the 5000-odd mummified scale insects, ectoparasites were encountered only once, when a few individuals were found with the rare *Aphytis* sp. noted in previous years. It is this virtual absence of ectoparasites that has led to the recent introduction of diffrennt *Aphytis* species from Queensland (see Ann. Rep. 1974) and Java (see above).

**Table 15. Parasitic hymenoptera in *Aulacaspis tegalensis* 1975**
**Emergents from samples of individuals killed by endoparasitism**

| | | | *Primary parasites* | | *Hyperparasites* | | | |
|---|---|---|---|---|---|---|---|---|
| *Locality* | *Date* | *No. parasitised Aulacaspis* | *Adelencyrtus miyarai* | *Physcus seminotus (female)* | *Physcus seminotus (male)* | *Tetrastichus sp.* | *Azotus spp.* | *Marietta carnesi* |
| Pte. aux Sables | 23.5.75 | *418* | *46* | *240* | *67* | *16* | *28* | *21* |
| | 24.6.75 | *603* | *31* | *369* | *149* | *11* | *3* | *40* |
| | 16.7.75 | *577* | *34* | *371* | *114* | *2* | *0* | *56* |
| | 11.8.75 | *463* | *4* | *364* | *83* | *4* | *4* | *4* |
| | | 2061 | 115 | 1344 | 413 | 33 | 35 | 121 |
| Tamarin | 21.5.75 | *345* | *118* | *141* | *62* | *8* | *15* | *1* |
| | 23.7.75 | *457* | *28* | *329* | *43* | *35* | *20* | *2* |
| | 13.8.75 | *364* | *8* | *261* | *78* | *0* | *16* | *1* |
| | | 1166 | 154 | 731 | 183 | 43 | 51 | 4 |
| Bénarès | 27.5.75 | *451* | *73* | *268* | *89* | *3* | *18* | *0* |
| | 22.7.75 | *440* | *29* | *277* | *128* | *3* | *0* | *3* |
| | | 891 | 102 | 545 | 217 | 6 | 18 | 3 |
| Forbach | 29.5.75 | *611* | *172* | *198* | *79* | *141* | *21* | *0* |
| | 7.7.75 | *303* | *4* | *178* | *74* | *40* | *7* | *0* |
| | | 914 | 176 | 376 | 153 | 181 | 28 | 0 |
| Argy | 4.6.75 | 272 | 36 | 159 | 34 | 43 | 0 | 0 |
| Totals | | 5304 | 583 | 3155 | 1000 | 306 | 132 | 128 |
| % | | 100 | 11.0 | 59.5 | 18.9 | 5.8 | 2.5 | 2.4 |

The data in Table 15 show clearly that *Physcus seminotus*, introduced from Uganda in 1969-71, has become the dominant species in the parasite complex associated with the scale insect. None of the other four species introduced since 1969 (see Ann. Rep. 1974) were recovered. Unfortunately, no method of assessing actual parasitism, as opposed to the relative incidence of the parasite species, has been devised but general observations strongly indicate a much higher general level of parasitism consequent to the establishment and island-wide spread of *P. seminotus*. There also appears to have been a recession of scale insect in some localities that may be attributable to the activity of this parasite.

*P. seminotus* is a primary parasite (i.e. a parasite of scale insect) only in the female sex: males develop as hyperparasites of females and of individuals of other parasite species. The interrelationships of the main components of the present parasite complex are shown in Fig. 10, where the sizes of the circles indicate relative abundance as derived from data in Table 15.

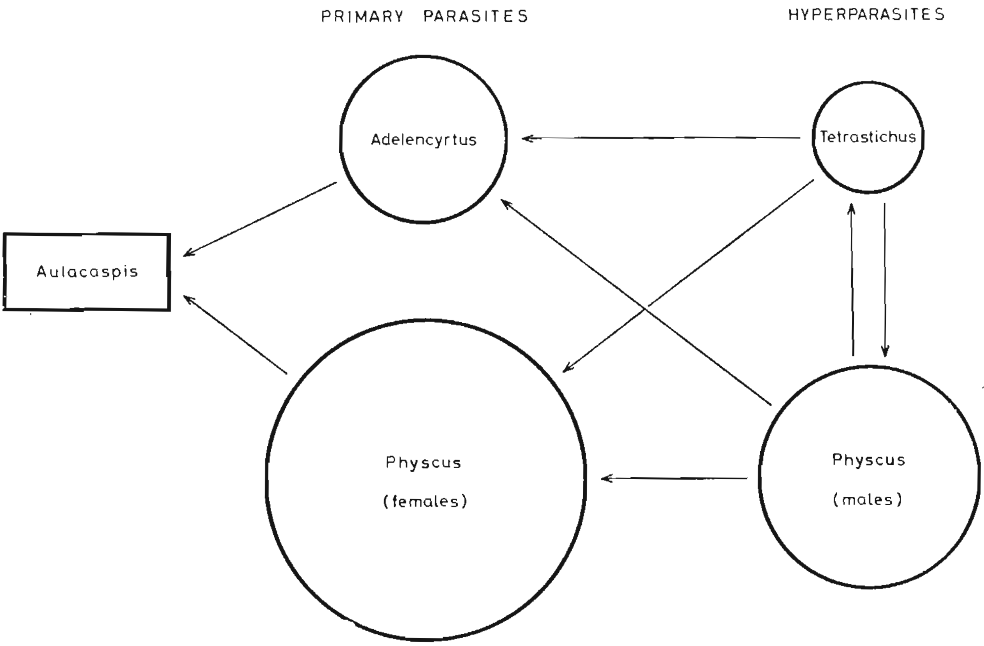



Fig. 10. Interactions and relative abundance of *Aulacaspis* parasites. The sizes of the circles show relative abundance.

## General

*Nematodes*

Samples of *Xiphinema* spp. were collected and sent for identification to M. M. Luc of the *Office de la Recherche Scientifique et Technique Outre Mer*, Paris. When the identification of the species has been completed, it is intended to publish an account of their distribution in sugar cane soils as influenced by edaphic and climatic factors.

*White grubs*

An outbreak of *Clemora smithi* was reported near Villebague in late December and large numbers of young 3rd-stage larvae were found eating the roots of ratoon cane. Damage by larvae of this species in December is unusual and must presumably be attributed to weather during the preceding months.

Larvae and adults of *Alissonotum piceum* attacked virgin cane at Bel Air, also in December. The larvae were found to be attacked by *Tiphia parallela*, which had not previously been recorded as a parasite of this white grub.

## WEEDS

**Evaluation of new herbicides**

New herbicides were evaluated with the Chesterford logarithmic sprayer in the super-humid zone at Belle Rive Experimental Station. Two trials were laid down. In the first, the herbicides tested were VT 2809, Destun, Tribunil and CGA 17020 and in the second, CGA 24705, VT 3219 and M & B 21181. In both trials the standard chemical was DCMU and dosage rates ranged from 5.38 to 1.34 kg a.i./ha.

A summary of the weed assessments in both trials is given in Table 16.

**Table 16. Weed assessment data**

(Frequency abundance method expressed as % of control)

| Herbicides | *Dosage rate 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)* |
|---|---|---|---|---|---|
| | *First experiment (105 days after spraying)* | | | | |
| DCMU | 22.6 | 23.0 | 23.1 | 25.5 | 28.5 |
| VT 2809 | 18.9 | 21.6 | 23.1 | 25.9 | 29.0 |
| Destun | 41.4 | 44.4 | 47.9 | 47.1 | 47.1 |
| Tribunil | 39.4 | 38.4 | 39.5 | 39.6 | 38.7 |
| CGA 17020 | 35.2 | 35.9 | 35.7 | 41.8 | 40.9 |
| | *Second experiment (120 days after spraying)* | | | | |
| DCMU | 26.5 | 28.5 | 29.5 | 29.7 | 28.1 |
| VT 3219 | 28.8 | 29.4 | 28.9 | 30.8 | 31.3 |
| CGA 24705 | 55.7 | 63.4 | 60.2 | 62.8 | 70.9 |
| M & B 21181 | 63.4 | 66.8 | 67.7 | 71.7 | 71.1 |

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

VT 2809, although it proved to be a very good herbicide, giving slightly better weed control than DCMU, will not be tested further in sugar cane as it severely affected cane growth and germination. Tribunil is a product recommended in various food crops and will be tested accordingly, while Destun, which is said to control *Cyperus rotundus*, will be tested specifically against this weed. CGA 17020 is to be included in small plot trials next year.

VT 3219 gave results comparable to DCMU. CGA 24705 and M & B 21181 did not but it must be stressed that unforeseen circumstances delayed the weed survey and this partly explains the fairly high weed infestation in the plots treated with these products. None of the three new products in the second trial affected cane growth or germination.

*Pre- and post-emergence small plot trials with Velpar*

1. Plant canes

Velpar has very good herbicidal properties, acting in pre- and post-emergence of weeds.

In pre-emergence, three experiments were carried out to compare Velpar at 0.13 - 2 kg a.i./ha to DCMU at 4 kg a.i./ha. The results showed that 0.13 kg a.i./ha does not give satisfactory weed control. However, Velpar at 0.25 kg a.i./ha was nearly as good as, and at higher rates was better than, DCMU at 4 kg a.i./ha.

The effect of Velpar on cane was variable. In one experiment (Valetta), cane growth was affected by application at 0.25 kg/ha. In another (Astrœa), the effect was evident only at rates higher than 0.5 kg. In the third (La Baraque), where the field was overhead-irrigated, no effect on cane was observed (Table 17).

**Table 17. Effect of Velpar on cane growth**

| *Herbicides* | *Dosages (kg a.i./ha)* | *Cane measurements as % of control* | | |
|---|---|---|---|---|
| | | *Valetta* | *Astroea* | *La Baraque* |
| DCMU (Control) | 4.0 | 113 | 108 | 105 |
| Velpar | 0.13 | 115 | 118 | 104 |
| Velpar | 0.25 | 84 | 100 | 116 |
| Velpar | 0.50 | 68 | 102 | 116 |
| Velpar | 1.0 | 54 | 82 | 100 |
| Velpar | 2.0 | 44 | 71 | 109 |
| Cane Variety | | M 93/48 | S 17 | S 17 |

In the post-emergence trials, Velpar at 0.13, 0.25, 0.5 and 1.0 kg a.i./ha, alone and mixed with 1.2 kg/ha Actril-D, was compared to DCMU at 2.5 kg a.i. + Actril-D at 1.2 kg a.i./ha. Weed control was good with rates of 0.25 kg and above and improved with rate. The effect of Velpar on cane was fairly severe, especially at the higher rates.

Nearly all the weeds controlled by DCMU were controlled by Velpar, which also gave satisfactory control of other weeds, namely, *Paspalum paniculatum* (Herbe duvet), *P. urvillei* (Herbe cheval), and *Oxalis* spp. (Trèfles).

The effect of Velpar on weeds in pre-emergence and post-emergence is comparable but its deleterious action on plant canes is considerably greater in post-emergence. Consequently, it is improbable that Velpar will find any use as a post-emergent spray in young plant canes.

2. Ratoons

Seven experiments were conducted, two in pre-emergence of weeds and five in post-emergence. The pre-emergence trials were located in the super-humid zone and the standard treatment was DCMU at 4 kg a.i./ha. In the post-emergence trials the standards were either DCMU or Atrazine at 2 kg a.i./ha mixed with 1.2 kg a.e./ha of Actril-D. Velpar at 0.25 - 2 kg a.i./ha, used alone and mixed with 1 and 2 kg a.i./ha of DCMU, was compared to the standard treatments. All treatments gave very good weed control and there seemed to be little gain by adding DCMU to Velpar. The effect on cane was not severe, even at the higher rates, but chlorotic effects were observed on some young canes. These experiments are to be harvested in 1976 to determine if Velpar reduces cane yield. If not, further experimentation will be made before a final decision is taken on the use of Velpar.

**Special weed problems**

*Paspalum urvillei* (Herbe cheval)

This graminaceous weed, which was not very common the 1960's, is frequently met with now in the superhumid and humid zones of the island. It is a tufted plant that can reach two metres in height.

Although complete control of this weed at all stages of growth can be obtained with Roundup and Asulox, Velpar was tested against it at 1, 2 and 4 kg a.i./ha with Asulox at 4 kg a.e./ha as control. Velpar at all doses gave complete kill of the weed after two weeks, as opposed to five to six weeks with Asulox.

**Roundup — properties and recommendations for different weed species**

The use of Roundup on a commercial scale began during the year. This herbicide acts only in post-emergence. It is rapidly decomposed in contact with soil and consequently has no effect on germination of weed seeds. It needs an adequate foliage in order to be absorbed and translocated to other parts of the plant. Dry conditions are essential for maximum efficacy of Roundup and should rain fall within six hours of application, poor weed control may result. Roundup should not be mixed with other herbicides, due to tankmix incompatibility.

Table 18 indicates the recommended rates of application for different weeds.

**Table 18. Dosage rates of Roundup for control of different weeds**

| *Weeds* | *Dosage rates* |
|---|---|
| *Cyperus rotundus* (Herbe à oignons)<br>*Paspalum paniculatum* (Herbe duvet)<br>*Paspalm urvillei* (Herbe cheval)<br>*Colocasia antiquorum* (Songe)<br>*Panicum maximum* (Fataque)<br>*Setaria barbata* (Herbe bambou) | 3 litres/hectare (1.25 litres/arpent) |
| *Paspalidium geminatum* (Herbe sifflette) | 12 litres/hectare (5 litres/arpent) |
| *Kyllinga monocephala* (Petit mota) | 1.8 litres/hectare (0.75 litres/arpent) |
| *Paspalum conjugatum* (Herbe créole) | 6 litres/hectare (2.5 litres/arpent) |
| *Paspalm distichum* (Chiendent de mare)<br>*Leersia hexandra* (Herbe la mare)<br>*Coix lacryma-jobi* (Collier cipaye) | 7.5 litres/hectare (3 litres/arpent) |

## FIELD MECHANIZATION

The Director and Mr. L. Pi Shan formed part of a delegation sent by the Chamber of Agriculture to Queensland, Australia, to obtain first-hand knowledge of field mechanization. Mr. C. Mazery visited Réunion island at the end of November, under the auspices of the *Comité de Collaboration Agricole Maurice-Réunion-Madagascar*, to follow trials with rock pickers and stone breakers.

Preparation of fields for mechanical loading and/or harvesting was being carried out on several estates in 1975. Some fifteen mechanical loaders were in use during the year, a number that will probably be exceeded in 1976. Trials were also made with the FUNKEY BELL and MC CONNEL wholestalk harvesters.

A new feature in cane transport was the introduction by one estate of 10-12 tonne infield trailers for use with mechanical loaders. These trailers would be eventually fitted with chain nets and used in trains of two or three from the field to the factory.

With the growing use of infield transport, the "Rational Load Distributor" devised by Mr. G. Mazery (see "A New Hitching Device for Wheel Tractors" — Ann. Rep. 1970, 82-85) is being increasingly fitted to tractors and trailers.

**Area suitable for mechanical harvesting**

To estimate the area of cane land suitable for mechanical harvesting operations, miller-planters' lands were classified according to slope and degree of stoniness. The results of the survey were as follows :

| | | |
|---|---|---|
| 1. Land with slope up to 30% | | |
| (a) requiring little or no destoning | 13 967 ha | (33 101 arp.) |
| (b) requiring some destoning | 13 461 ha | (31 903 arp.) |
| (c) requiring extensive destoning | 16 622 ha | (39 395 arp.) |
| | 44 050 ha | (104 399 arp.) |
| 2. Land with slope greater than 30% | 5221 ha | (12 373 arp.) |

It is considered that mechanized harvesting would be very difficult on lands of more than 30% slope.

**Mechanical planting**

An experiment to compare mechanical with hand planting was established at Union Ducray. Different methods of field preparation and fertilization are included in the experiment.

**Method of planting**

The trials laid down in 1974 at three sites to compare yields obtained with three methods of planting — the usual furrow planting, planting on flat ground, and planting on ridges — were harvested. Results indicated no difference between the treatments (Table 19). The trials are being continued.

**Table 19. Yields obtained with different methods of planting**

| *Location* | *Standard Planting TCH (TCA)* | *Flat Planting TCH (TCA)* | *Ridge Planting TCH (TCA)* |
|---|---|---|---|
| Sans Souci | 88.4 (37.3) | 86.7 (36.6) | 85.6 (36.1) |
| Bel Etang | 80.3 (33.9) | 80.8 (34.1) | 82.5 (34.8) |
| Beau Plan | 51.2 (21.6) | 46.5 (19.6) | 44.1 (18.6) |

**Effect of burning on ratoons**

A trial to determine the effect of burning on yields of ratoons was laid down at Bel Ombre.

**Effect of mechanical loading on ratoon growth**

The three experiments laid down to determine if the use of mechanical loaders affects ratoon growth were harvested. In the two trials at FUEL there was no difference in yield between mechanically-loaded and hand-loaded plots. At Beau Plan, yields from the mechanically-loaded plots were significantly higher than those from the hand-loaded plots (Table 20). The trials are being continued.

**Table 20. Effect of mechanical loading on ratoon growth**

| Location | Variety | Category | Date of harvest | Date of previous harvest | Type of mechanical loading | Average yields (TCH) Hand loaded | Mechanically loaded |
|---|---|---|---|---|---|---|---|
| Unité, FUEL | S 17 | 2nd ratoon | Aug. 75 | Aug. 74 | 14 rows piled into 3 windrows and loaded on one pass through field | 53.1 | 53.1 |
| Belle-Ville, FUEL | M 377/56 | 4th ratoon | Oct. 75 | Oct. 74 | 12 rows piled into 3 windrows and loaded on one pass through field | 89.1 | 91.0 |
| Beau-Plan | M 13/56 | 2nd ratoon | Sept. 75 | Sept. 74 | Pushpiling 4 rows piled into one windrow | 57.6 | 59.7 |

### Transport

A study was begun on the modifications needed to tip "corbeilles" directly into the mill carrier after their transport to the factory yard on standard self-loaders. The proposed new system would be suitable for both wholestalk and chopped canes.

## SUGAR MANUFACTURE

### Effluent treatment

Experiments on the purification of water from fly ash removal systems (wet scrubbers) and of mud filter wash water were carried out. Settling techniques were investigated for separation of suspended matter, which is the main objectionable constituent of these effluents.

The work involved, firstly, the determination in the laboratory of settling characteristics of filter wash and wet scrubber effluents and mixtures of the two. Wet scrubber effluent was found to settle easily whereas filter wash water proved more difficult to purify by settling. However, settling characteristics of a mixture of 75% filter wash and 25% wet scrubber water were found to be satisfactory, an acceptable supernatant being obtained after 10 minutes settling time. Increasing proportions of wet scrubber improved the settling characteristics of the mixture.

Continuous settling trials using a small pilot subsider of similar design to the S.R.I. (Mackay) pilot subsider were then conducted at Highlands factory, where the wet subsider is operated on effect condensates in a once through arrangement, and at Constance La Gaiété factory, where scrubber water recirculates over a DSM screen and filter wash water is used for making up water losses. The factory trials confirmed observations made in the laboratory.

In view of the eventual design of a full scale settling installation, flow rates of mud filter wash and wet scrubber water were measured at Highlands by means of an in line flow meter/integrator. The effluent flows ranged between 0.6 to 0.7 $m^3$/tonne cane for filter wash and 0.7 — 0.9 $m^3$/tonne cane for the wet scrubber.

### Suspended matter in mixed juice

Suspended matter in mixed juice can introduce errors in the sucrose balance of a sugar factory. In the official method of analysis of mixed juice for sucrose content, a measured volume (not mass) of juice is used and conversion of volume to mass is made through Brix determination and Brix/density relationship. Suspended matter is therefore accounted for as sucrose-rich juice and would therefore tend to inflate mass of sucrose entering process. It has been reported [1,2] that suspended matter also introduces a bias in the refractometric Brix determination, its presence giving an inflated Brix figure resulting therefore in a lower than real sucrose % mixed juice.

1. Mac Gillivray, A.W. & Graham, W.S. (1969). Brix determination. *Proc. S.A.S.T.A.* **43** : 215
2. Prince, P.A. (1969). The determination of suspended solids in mixed juice. *Proc. S.A.S.T.A.* **43** : 141.

A survey was carried out of suspended matter content of mixed juice to assess the extent of the error it introduces in the chemical control of sugar factories. The method described by Prince[2] was used. The results are summarized in Table 21.

**Table 21. Suspended solids in mixed juice**

| *Factory* | *Average suspended solids % mixed juice* |
|---|---|
| Riche-en-Eau | 0.52 |
| Deep River-Beau Champ | 0.43 |
| Constance | 0.41 |
| Rose-Belle | 0.23 |
| Britannia | 0.50 |
| Highlands | 0.41 |
| Mon Désert-Alma | 0.55 |
| Réunion | 0.43 |
| The Mount | 0.51 |
| Beau Plan | 0.44 |
| Belle Vue | 0.54 |
| St. Félix | 0.47 |
| F.U.E.L. | 0.54 |
| Union St. Aubin | 0.43 |
| Bel Ombre | 0.44 |
| Mon Désert-Mon Trésor | 0.46 |

It was possible at four factories to compare suspended matter content of mixed juice from hand cut and hand loaded cane with that from hand cut and mechanically loaded cane. The cane at each factory, respectively, was of same variety and age, and came from the same fields. From visual observation, the mechanically loaded cane appeared to have a higher extraneous matter content than the hand loaded cane.

A study of the effect of suspended matter on Brix determinations was also carried out during these tests. Treatments consisted of (a) sieving over 80 mesh as is done for routine analysis, (b) filtering over G.P. filter paper, (c) filtering over Whatman No. 1 filter paper, (d) filtering over Whatman No. 42 filter paper, and (e) centrifuging at 15 000 g for 15 mins at 20°C in a refrigerated centrifuge. The results of the comparisons are shown in Table 22.

**Table 22. Suspended matter content and Brix of mixed juice from hand loaded and mechanically loaded cane**

| *Factory* | *Suspended matter % mixed juice* | | *Refractometric Brix after* | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | *Sieving over 80 mesh* | | *Filtering over G.P. paper* | | *Filtering over Whatman No. 1 Paper* | | *Filtering over Whatman No. 42 Paper* | | *Centrifuging at 15000g for 15 min.* | |
| | *H* | *M* | *H* | *M* | *H* | *M* | *H* | *M* | *H* | *M* | *H* | *M* |
| F.U.E.L. | 0.53 | 0.77 | 15.54 | 16.02 | 15.42 | 15.87 | 15.42 | 15.85 | 15.44 | 15.84 | 15.42 | 15.93 |
| U.S.A. | 0.39 | 1.18 | 13.07 | 12.33 | 12.96 | 12.15 | 12.96 | 12.15 | 12.98 | 12.19 | 12.98 | 12.17 |
| Riche-ne-Eau | 0.41 | 0.65 | 13.05 | 13.22 | 12.94 | 13.06 | 12.95 | 13.05 | 12.95 | 13.06 | 12.97 | 13.09 |
| Bel Ombre* | 0.44 | 0.90 | 14.48 | 12.42 | 14.35 | 12.32 | 14.36 | 12.26 | 14.34 | 12.27 | 14.40 | 12.32 |

H = hand cut and hand loaded
M = hand cut and mechanically loaded
* At Bel Ombre M = mechanically cut and loaded

There was a highly significant difference between amount of suspended matter in mixed juice from hand loaded and from mechanically loaded cane. The differences in Brix between the various treatments, however, was not significant at 5% level.

The amount of mechanically loaded cane is expected to increase substantially in the future and it is therefore desirable to extend the survey of suspended matter to the whole sugar industry. It should then be possible to decide if a change of analytical methods is necessary.

**Measurement of losses during evaporation of clarified juice**

In 1974 attempts were made to evaluate sucrose losses during industrial evaporation of clarified juice by using chloride as reference. The chloride determination was made using a Buchler Cotlove chloridometer. The results of this investigation were questionable because sucrose gains were recorded in some instances.

Although the chloride determination gave reproducible results it was found that its accuracy depended upon the media.

Whenever absolute values of chloride concentrations are required for comparison, it is necessary to carry out recovery tests in the particular medium and apply a correction factor.

The assumption that chlorides pass through the manufacturing process unchanged was then checked. A sample of clarified juice was divided into six portions. With each, chloride was determined and a known mass evaporated under vacuum in 2-litre glass flasks to syrup consistency (49.2-59.5°). The mass and chloride content of each syrup sample were determined and chloride input and output for each evaporation calculated. No significant difference was found between total chloride before and after evaporation. It was therefore concluded that the use of chloride as reference for assessing process losses was valid.

Further samples of clarified juice were evaporated under vacuum in a laboratory effect-evaporator. The chloride input and output were determined as in the previous experiment and were found to be identical. Clarified juice and syrup samples were also analysed for Brix, sucrose and reducing sugars and the analytical figures used to calculate changes in Brix, sucrose and reducing sugars during the evaporation process. Data pertaining to this investigation are given in Tables 23 and 24.

**Table 23. Clarified juice & syrup analysis**

| | *Clarified juice* | *Syrup* |
|---|---|---|
| Brix % | 12.97 | 63.30 |
| Sucrose % | 11.61 | 57.11 |
| Reducing Sugars % | 0.37 | 2.33 |
| Chloride % | 0.0635 | 0.317 |
| Gravity purity | 89.5 | 89.4 |
| Glucose ratio | 3.2 | 4.1 |

**Table 24. Changes of Brix, Sucrose and Reducing Sugars during evaporation under laboratory conditions**

| | |
|---|---|
| Brix loss % Brix originally in clarified juice | 2.2 |
| Sucrose loss % Sucrose originally in clarified juice | 1.4 |
| Reducing Sugars loss % Reducing Sugars originally in clarified juice | 19.0 |

As illustrated in this instance, it is possible with the chloride balance method to assess simultaneously destruction of Brix, sucrose and reducing sugars whereas usual methods of factory control, namely gravity purity and glucose ratio, are incapable of detecting such losses. It is proposed next season to use the technique to assess losses during evaporation under industrial conditions.

**Survey of juice deterioration in clarifiers during factory shutdown**

In recent years, most factories have been inadequately supplied with cane and have not been able to operate round the clock Under such conditions sugar products held in stock, more particularly the unconcentrated and hot clarified juice, could be expected to deteriorate. An estimate of such deterioration was carried out.

Juice was sampled from sampling cocks of clarifiers at factory close-down and start-up and analysed for sucrose and reducing sugars. The pH and the temperature of juice at close-down were also noted. Using the analytical figures, losses of sucrose, gains in reducing sugars and losses of recoverable sucrose were calculated. Final molasses purities and B.H.E. for the particular week and factory were used for calculation of recoverable sucrose. The results of the survey are summarized in Table 25 and should provide a basis for working out the cost benefits, if any, of introducing the newly developed S.R.I. (Mackay) clarifiers. Such clarifiers have a short retention time (30 minutes approximately). It is therefore practicable to liquidate their contents at factory shutdowns thus reducing loss of sucrose through fermentation.

**Continuous crystallization by evaporation under vacuum**

Attempts were made to evaluate the performance characteristics of the continuous vacuum crystallizer designed by F. Langreney[1] and installed at Beau Champ factory.

The crystallizer, which was used for low-grade work, could only be operated intermittently because of daily factory shutdowns resulting from shortage of cane. The experimental work was consequently seriously hampered and it was not possible to determine precisely the performance characteristics of the equipment. Observations made on a limited number of test runs indicate that the fundamental concepts embodied in the design are sound.

**The performance of crystallizers for high purity massecuites**

At certain factories, the purity drop between high grade massecuite and runnings has been observed to decrease following replacement of bath crystallizers by continuous crystallizers. A preliminary investigation of this problem was carried out and it appears that the use of diluted runnings for massecuite lubrication is the main reason for unsatisfactory crystallizer work. Such practices tend to lower the cœfficient of supersaturation of the mother liquor and hence impede crystallization. It should be stressed that only green molasses from the same strike, separated before steam is turned on in the centrifugal, should be used for lubrication.

**Statistical relationship between Brix and solids**

When investigating the exhaustibility of Mauritius molasses, a direct relationship had been found between total solids obtained by using the Gardiner oven and refrectometric Brix. A statistical analysis indicated a linear relationship significant at 0.1% level, the regression formula reading as follows :

$$\text{Dry matter (or total solids)} = 0.821 \text{ Ref. Bx} + 9.65$$

Consequently, it is possible to obtain true purity from gravity purity and the relevant expression is :

$$\text{True purity} = 1.10 \text{ Gravity purity} - 1.15$$

1. Langreney, F. (1973). Nouvelle approche pour la réalisation d'un appareil à cuire continu. *Revue agric. sucr. Ile Maurice* **52** : 298-901.

**Table 25. Survey of losses in clarifiers during shutdowns in 1975**

| FACTORY | *LONG STOPPAGES (Weekends & Public Holidays)* | | | | | | *SHORT STOPPAGES (Daily shortage of cane)* | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Average duration of stoppage hrs&range* | *Lost sucrose % sucrose initially in clarifier* | *Lost rec. sucrose % sucrose rec. initially in clarifier* | *Gain R.S. % sucrose initially* | *pH at stop* | *Temp. at stop °C* | *Average duration of stoppage hrs&range* | *Lost su-% sucrose initially in clarifier* | *Lost rec. sucrose % sucrose rec. initially in clarifier* | *Gain R.S. % sucrose initially* | *pH at stop* | *Temp. at stop °C* | *Bacteriostatic agent used in clarifier* |
| SAINT FELIX | 29(25-41) | 4.94 | 5.89 | 0.35 | 7.4 | 84 | — | — | — | — | — | — | Halamid |
| CONSTANCE | 37(30-52) | 1.26 | 1.92 | 0.45 | 8.0 | 86 | — | — | — | — | — | — | Formol |
| ROSE BELLE | 42(30-58) | 2.62 | 4.81 | -(0.90) | 7.6 | 95 | — | — | — | — | — | — | Halamid |
| MEDINE | 33(26-59) | 6.20 | 8.26 | 2.78 | 7.9 | 95 | — | — | — | — | — | — | CMA |
| REUNION | 33(29-53) | 0.08 | 1.29 | 0.50 | 7.8 | 96 | — | — | — | — | — | — | — |
| BEL OMBRE | 35(24-43) | 3.24 | 6.43 | 3.15 | 7.3 | 94 | 7( 3-14) | 1.29 | 3.12 | 1.19 | 7.1 | 96 | — |
| BRITANNIA | 35(27-38) | 2.23 | 3.68 | 0.89 | 7.6 | 89 | 11( 9-13) | 0.90 | 1.96 | -(0.09) | 8.3 | 89 | Halamid |
| MON DESERT ALMA | 33(27-40) | 2.64 | 4.20 | 0.09 | 7.5 | 95 | 5( 1-12) | 0.34 | 0.88 | 0 | 7.4 | 95 | — |
| RICHE EN EAU | 40(29-59) | 1.64 | 4.10 | 1.30 | 7.2 | 87 | — | — | — | — | — | — | — |
| SOLITUDE | 38(29-83) | 2.84 | 5.19 | 1.03 | 7.9 | 88 | 7( 2-16) | 1.39 | 2.57 | 1.15 | 7.9 | 92 | — |
| SAVANNAH | 39(27-82) | 2.88 | 5.73 | 1.20 | 7.6 | 96 | 5( 3-8 ) | 2.03 | 3.68 | 0.34 | 7.1 | 96 | Halamid |
| BELLE VUE | 34(24-41) | 5.42 | 7.15 | N.D. | 7.8 | 100 | 11(10-12) | 0.30 | 1.80 | N.D. | 6.9 | 100 | CMA & Busan |
| HIGHLANDS | 36(31-50) | 4.30 | 6.35 | 1.26 | 8.0 | 100 | 10( 6-15) | 1.70 | 0.34 | 7.5 | 7.5 | 100 | Halamid |
| MON TRESOR | 34(30-39) | 1.68 | 3.05 | 0.74 | 7.2 | 92 | 9( 5-17) | 2.00 | 3.15 | 0.18 | 7.3 | 93 | Halamid |

During 1975 this work was extended to other technical solutions, namely, mixed juice, clarified juice, syrup, A massecuite and A runnings. Highly significant correlations were obtained with each between total solids obtained by drying and refractometric Brix. Expressions for calculating total solids from refractometric Brix and true purity from gravity purity or apparent purity were calculated and are shown in Table 26. Similar work on B and C massecuites and B runnings is in progress. This work should prove useful for conversion of routine chemical control figures into true purities for the purpose of calculating boiling house mass balances.

**Table 26. Total Solids, Refractometric Brix and True Purity/Gravity or Apparent Purity relationship for sugar solutions**

| *Product* | | | *Regression Formulae* | | *No. of Pairs* | *Corr. Cœff.* |
|---|---|---|---|---|---|---|
| Mixed Juice | Total Solids | = 1.04 | Ref. Brix | — 0.69 | 19 | 0.990 |
| | True Purity | = 0.795 | Gravity Purity | + 18.72 | | 0.871 |
| Clarified Juice | Total Solids | = 1.02 | Ref. Brix | — 0.66 | 19 | 0.996 |
| | True Purity | = 0.964 | Gravity Purity | + 5.39 | | 0.916 |
| Syrup | Total Solids | = 0.980 | Ref. Brix | + 0.07 | 19 | 0.998 |
| | True Purity | = 0.799 | Gravity Purity | + 19.40 | | 0.936 |
| | Total Solids | = 1.01 | Ref. Brix | — 2.11 | | 0.870 |
| A. Massecuites | True Purity | = 0.904 | Gravity Purity | + 9.50 | 18 | 0.981 |
| | True Purity | = 0.834 | Apparent Purity | + 16.52 | | 0.958 |
| | Total Solids | = 0.968 | Ref. Brix | — 1.56 | | 0.975 |
| A. Runnings | True Purity | = 0.972 | Gravity Purity | + 5.20 | 19 | 0.993 |
| | True Purity | = 0.843 | Apparent Purity | + 14.96 | | 0.994 |

**Exhaustibility of final molasses**

Work on this project was continued and a further twelve boiling-down tests completed, bringing the total number of tests to twenty three. Final molasses from all Mauritian sugar factories and therefore derived from cane of various varieties grown in a wide range of soil types and climatic conditions were used. The molasses samples were analysed before and after exhaustion for Brix, moisture (Karl Fisher), sucrose, reducing sugars and sulphated ash.

Brix and dry matter (100 — $H_2O\%$ by K.F.) were found to be strongly correlated.

Linear, quadratic and exponential relationships between expected purity (gravity and true) and R.S./Ash ratio were investigated but no statistically significant relationship was found between these sets of data.

**Advisory work**

*Clarification*

Unsatisfactory juice clarifier performance at Réunion factory was investigated and rectified.

*Starch*

An investigation was carried out into the causes of high starch content and low filterability of raw sugar at FUEL. The starch content of mixed juice was found to be about twice the usual level, probably owing to the effect of cyclones *Gervaise* and *Inès* on the cane. Although the enzymic starch removal process, using natural enzymes, was working efficiently, residual starch level in mixed juice was still too high. Under such adverse conditions the use of bacterial enzymes would have been helpful but such enzymes were not available locally.

*Chemical control*

Investigations into undetermined losses were carried out at Mon Désert Mon Trésor and Rose Belle. Mixed juice and final molasses scales were checked and found correct. A survey was made of sucrose losses in condensates and condenser tail pipe water and of suspended matter in mixed juice. The levels of these could not account for the reported undetected losses. Owing to lack of cane, both these factories had a very poor overall time efficiency and deterioration of products stocked for longer than usual may have contributed to high undetermined losses.

*Power plant*

A steam and electrical power balance for Dubreuil tea factory was carried out. The proposed installation of a steam turbine-driven power generating plant suitable to render the tea factory self-sufficient in electrical power was studied.

## BY PRODUCTS

### Steam-treated bagasse

An *in vivo* evaluation was made of the digestibility of the crude fibre component of steam-treated and untreated bagasse. Molasses and spent yeast were incorporated in the diet to obtain a satisfactory intake. The apparent digestibility cœfficients obtained were 53.4 and 52.2 for treated and untreated bagasse, respectively. Although digestibility had therefore not been increased by steam treatment, voluntary intake of the treated bagasse was more than twice that of the untreated — 688 g dry matter as opposed to 318 g.

### Digestibility of scums

Owing to a renewed interest in the use of scums in ruminant rations, a digestibility trial was carried out with sheep. The ration used and the digestibility of its constituents were as follows :

| *Ration* | | *% digestibility of ration constituents* | |
|---|---|---|---|
| Fresh scums | 1700 g | Organic matter | 25 |
| Molasses | 500 g | Nitrogenous matter | 20 |
| Salt | 10 g | Ether extract | 15 |
| Vitamin/mineral supplement | 10 g | Nitrogen-free extract | 30 |
| | | Crude fibre | 19 |

Drying of scums is essential to prevent development of fungi. Oven-dried scums were therefore used in another digestibility trial, the dried and ground scums being soaked in water before preparing the diet. Results were as follows :

| *Ration* | | *% digestibility of ration constituents* | |
|---|---|---|---|
| Dried scums | 700 g | Organic matter | 40 |
| Water | 900 g | Nitrogenous matter | 10 |
| Molasses | 500 g | Ether extract | 28 |
| Salt | 10 g | Nitrogen-free extract | 55 |
| Vitamin/mineral supplement | 10 g | Crude fibre | 12 |

Oven-drying of scums, therefore, had a depressing effect on their digestibility (from 20% to 10%). These results correspond with values obtained at this Institute some 10 years ago.

## OTHER CROPS

MAIZE
POTATOES
GROUNDNUTS
SOYA BEANS
FRENCH BEANS
PEAS
RICE
CARROTS

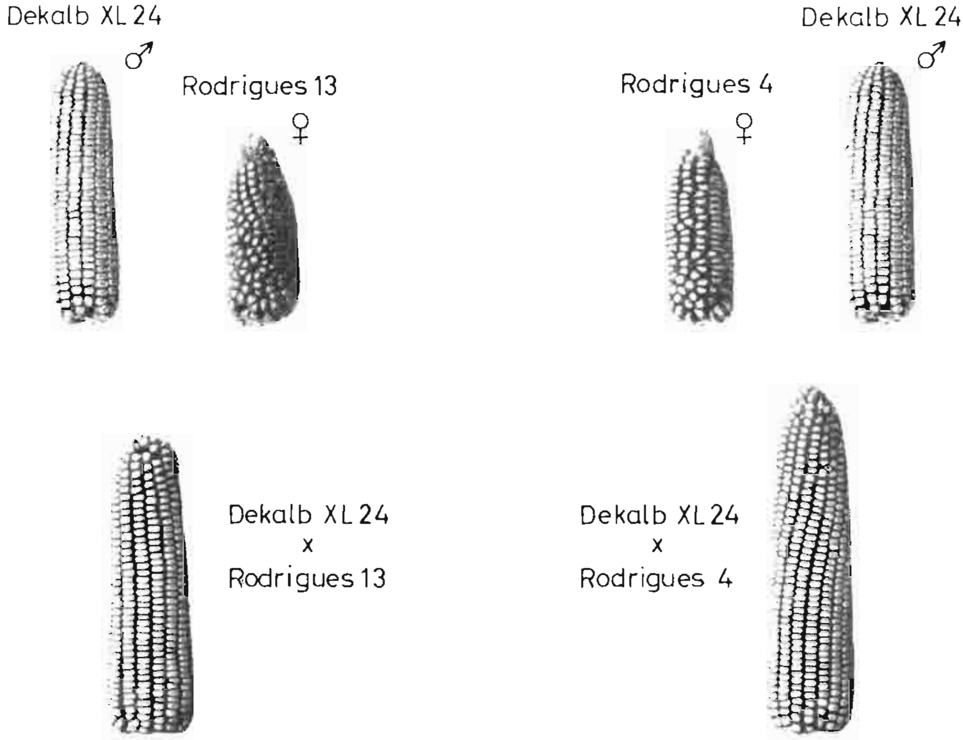



Plate VI. Maize breeding. *Top*; Production of three-way crosses using the single hybrid (DECALB XL 24) and pure Rodrigues lines. *Bottom*; Three-way cross (DECALB XL 24 × Rodrigues 4) showing uniformity of height of ear insertion.

# 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) Seventh generation selfing of the basic material from Savanne and Flacq.

(b) Fifth generation selfing of the stock from Le Morne, Pailles, Nouvelle Découverte, Richelieu and Solitude.

Unfortunately, most of the plants were damaged by cyclones *Gervaise* and *Inès* and single crosses of selected lines to be grown in 1975 had to be cancelled. The selfing programme was repeated in October 1975.

A few homozygous lines from the Mauritius stock showing the "erect-leaf" character were selected for evaluation as possible parents for a three-way cross with the French single-cross hybrid *Dekalb XL 24.*

Owing to the cyclones, seeds were collected from only 20 out of 27 crosses of selected homozygous lines from Rodrigues with *Dekalb XL* 24 (Plate VI). The hybrids were evaluated for yield and other agronomic characters in replicated field trials at Réduit. Some of the three-way crosses yielded about 7 tonnes per hectare. The best crosses will be evaluated in different areas in 1976.

*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 in September at different densities at two sites, Réduit and Pamplemousses. The hybrids that gave the highest yields are to be tested further in 1976.

*Cultivation of hybrid maize in interrows of virgin canes*

It has already been established that certain types of hybrid maize can be cultivated in the interrows of ratoon cane without affecting sugar yields. Experimentation on this subject in virgin canes was, however, continued.

Two trials with the French hybrid *United 530* were laid down in September in each of the following locations : Ebène, Médine (Bassin), Savannah, Bel Air St. Félix. One trial was planted with maize in every cane interrow and the other with maize in every second interrow. Maize yields and cane yields will be assessed in 1976.

## Pests

*Insect damage to cobs*

A survey of insect damage to cobs carried out in the 1974-75 season did not give clear results and was being repeated on a larger scale and with different methods at the end of the year in the 1975-76 crop. It is quite clear from data acquired that there is considerable loss of grain on the cob due to insect attack but several species are involved and at times other, non-insect, factors also play a role.

*Heliothis armigera* (Plate VII) is probably the most important of the cob-attacking species. A search was made for its parasites, with the possibility of biological control in mind, as none were on record. *Trichogramma australicum* Gir. was found to be a common parasite of the eggs but other immature stages appear to be virtually free from parasites.

Insecticidal control of *Heliothis* on maize was considered and two experiments were conducted. It was concluded that treatment of ripening cobs is not a practical proposition.

*Webworm*

Webworm (*Angustalius malacellus*) was again a problem in many fields where maize had been planted in the interrows of ratoon cane, particularly if the cane had been burnt at harvest. The eggs appear to be laid on the soil in close proximity to the germinating seedlings, necessitating very early application of insecticide.

**Diseases**

Investigations on virus diseases of maize were continued during the year. Four virus diseases were distinguished by vector transmission studies, electron microscopy and agar gel diffusion serology (Plate VIII). Acknowledgement is made to the Department of Biological Sciences at Exeter University for electron-microscope facilities and to Dr. K. Bock of the U.K. Overseas Development Administration for the supply of antisera.

*Streak*

A survey of maize plantations revealed two main areas of infection by streak: along the coast from Mahébourg to Beau Champ and from Case Noyale to Le Morne. The disease was observed in first plantings at Beau Champ, Ferney, Pamplemousses and Riche-en-Eau. Its high incidence in fields of very young maize at Ferney and Beau Champ indicated massive infection from an outside source. Sampling was carried out in a field of *Anjou 360* and *United 530* at Beau Champ and Case Noyale, respectively, to determine the percentage of plants infected at different stages of the growth cycle. Yield losses were assessed by weighing cobs from representative samples of different infection categories. The data collected are given in Fig. 11. Forty per cent infection was observed in the field of *Anjou 360* and caused a yield reduction of about 28%. In *United 530*, 50% infection was recorded and the yield loss was estimated as 24%. The greatest loss was due to infection from outside sources early in the growth cycle. However, some infection occurred later, probably from within-field transmission.

Transmission tests with the vector *Cicadulina mbila* were pursued to determine which grass hosts harbour the strain of the virus that causes disease in maize. The grass hosts that are naturally infected with streak are cane, *Coix*, *Brachiaria*, *Digitaria*, *Paspalum*, *Panicum* and *Cenchrus*. Only isolates from *Brachiaria* and *Coix* have been transmitted to maize so far. While the *Brachiaria* isolate was indistinguishable from the maize strain, the one from *Coix* differed slightly. Both hosts are believed to play an important role in outbreaks of the disease in maize in Mauritius. Naturally infected *Coix* has so far been encountered only in the South East and South West but infected *Brachiaria* has been found in several localities. Widespread infection in *Panicum* and *Digitaria* does not appear to be dangerous to maize.

The identification of the virus was confirmed by serology using maize streak antiserum from Kenya.

*Viruses transmitted by* Peregrinus maidis

In addition to maize mosaic virus, which was identified in 1974 by electron microscopy, two other viruses were found to be transmitted by *Peregrinus maidis*. They appear to be maize line and maize stripe and work on their purification and on electron microscopy is planned to confirm their identities. The three diseases are not important in the local variety of maize but most foreign hybrids have proved susceptible.

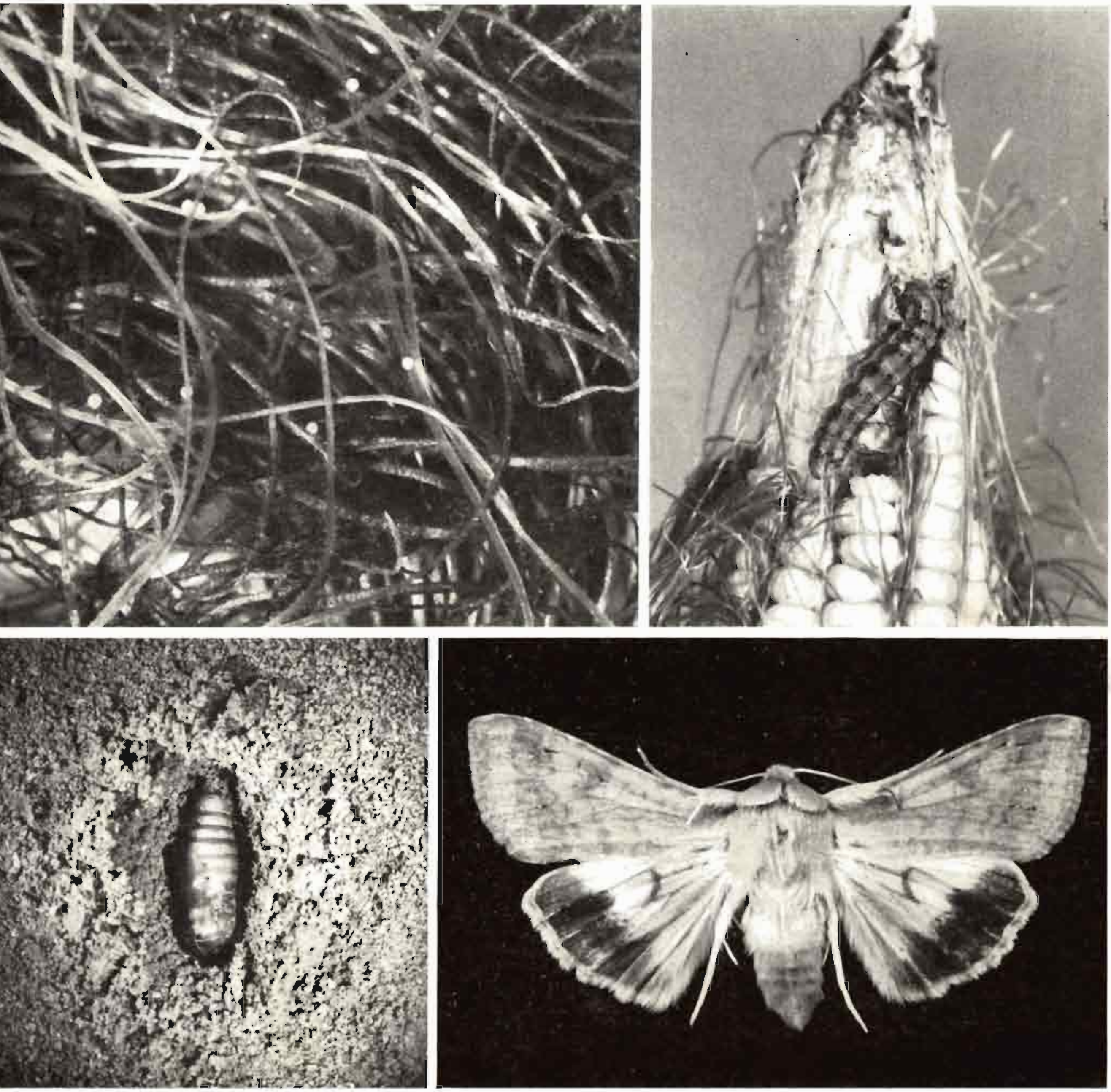
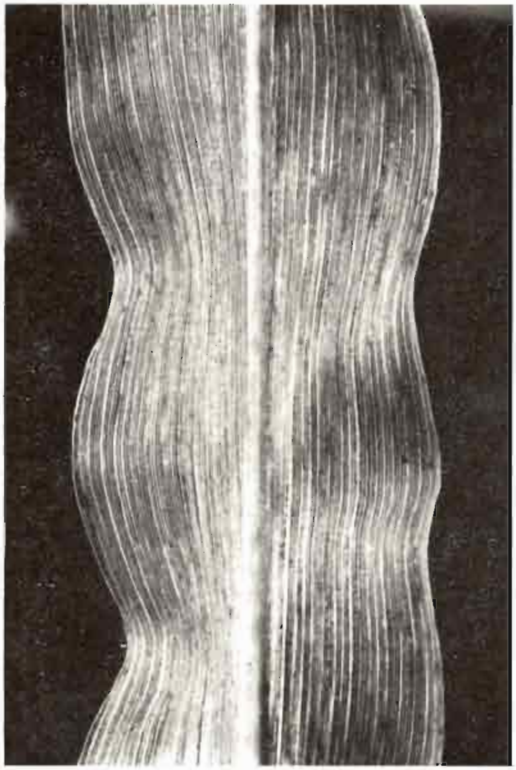
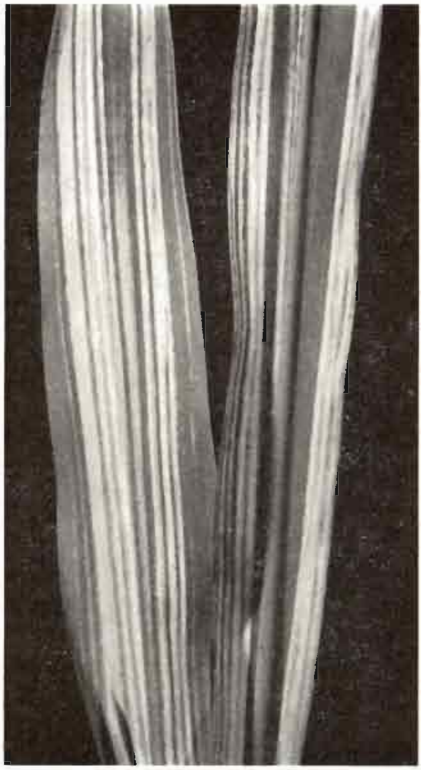
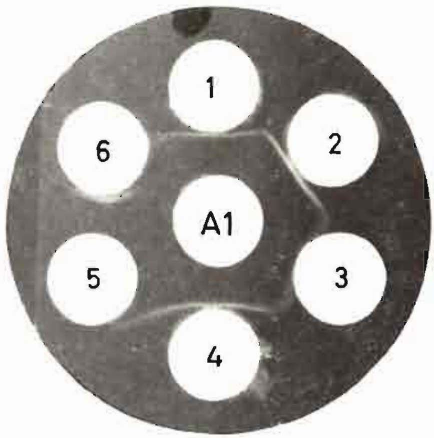


Plate VII. Life stages of the maize earworm, *Heliothis armigera*. *Top, left*; Eggs on silk. *Top, right*; Larva eating kernels. *Bottom, left*, Pupa in soil. *Bottom, right*; Adult.



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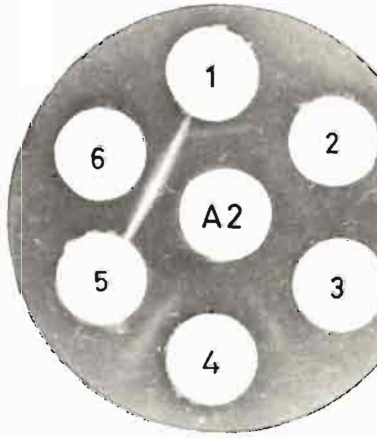
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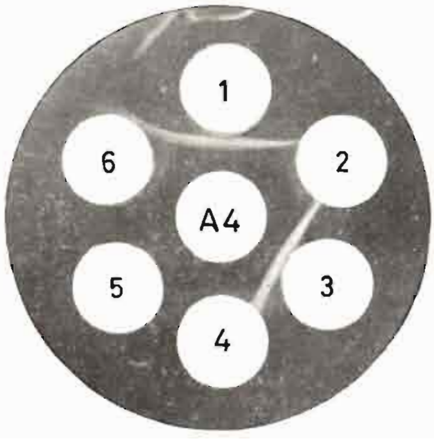
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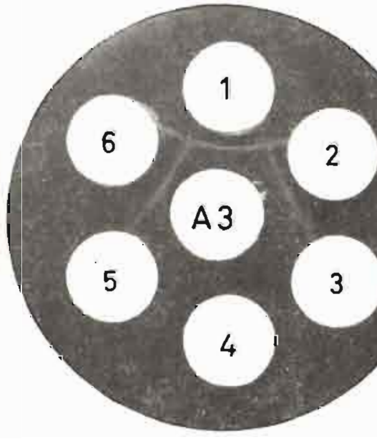
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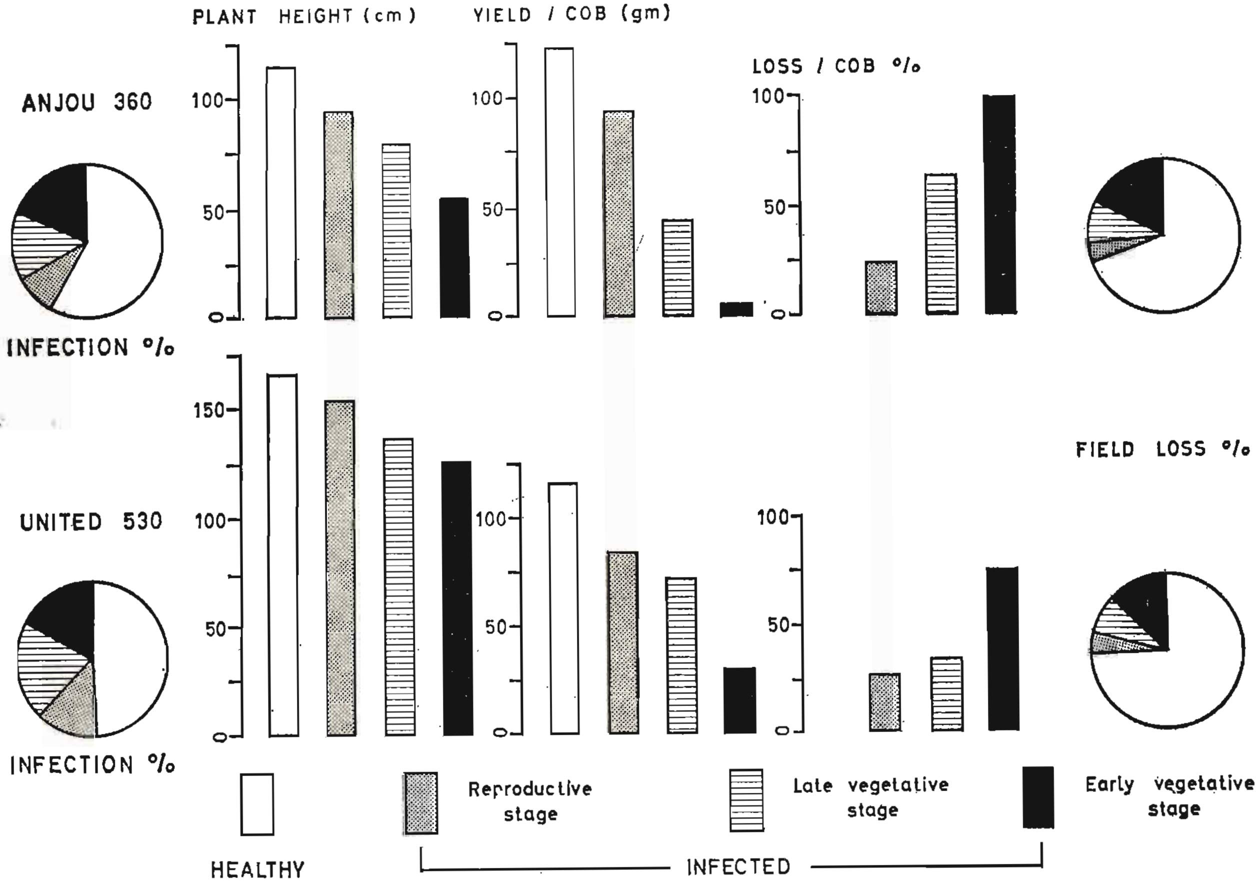


Fig. 11. Streak infection and yield loss in two fields of maize hybrids.

Electron microscope investigations have confirmed the identity of the maize mosaic virus in both maize and *Sorghum verticilliflorum*. The disease was transmitted from the grass to maize and back by the vector indicating that *S. verticilliflorum* could be an important alternate host.

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Plate VIII. Maize virus diseases. *Top, left*; Symptoms of maize mosaic virus. *Top, middle*; Symptoms of a virus disease possibly related to maize stripe. *Top, right*; Symptoms of a virus disease possibly related to maize line. *Bottom, left*; Electron micrograph of a diseased cell of maize infected with maize mosaic virus. *Bottom, right*; Precipitin reaction in agar gel of virus diseases of maize.

Centre well $A_1$ containing streak antiserum. The peripheral wells containing crude sap extracted from 1 : infected maize; 2 : infected *Cenchrus*; 3 : *Cenchrus* infected with the *Coyx* strain of streak; 4 : *Cenchrus* infected with the *Panicum* strain of streak; 5 : Healthy maize; 6 : infected *Coyx*.

Centre well $A_2$ containing stripe and line antisera. The peripheral wells containing crude sap extracted from 1 : maize infected with a virus related to line; 2 and 4 : maize infected with streak; 3 : healthy maize; 5 : maize infected with maize mosaic virus; 6 : maize infected with a virus related to stripe.

Centre well $A_3$ containing streak and line antisera. Peripheral wells containing crude sap extracted from 1 : maize infected with streak; 2 and 6 : maize infected with a virus related to Line; 3 and 5 : maize infected with maize mosaic virus; 4 : healthy maize.

Centre well $A_4$ containing stripe antisera. Peripheral wells containing crude sap extracted from 1 and 3 : maize infected with a virus related to stripe; 2 : maize infected with a virus related to Line; 4, 5 and 6 : healthy maize.

## POTATO

### Introduction of varieties

The varieties *Companion, Red Bad, Resonant* and *Siro* were received from the Institute for Research on Varieties of Field Crops, Wageningen, Holland, and *Saida* was received from *La Fédération Nationale des Producteurs de Plants de Pommes de Terre*, France.

### Variety trials

Two trials were laid down at Beau Plan in May and two at Ebène in June with newly-imported and recently-imported varieties planted in the interrows of virgin cane. A randomised block design with 3 replicates was adopted and blight was controlled by regular sprays of Dithane M-45 in one of the trials in each locality but not in the other.

High yields were obtained in the trials at Beau Plan (Table 27). Varieties *Spunta, Désirée, Claustar, Cardinal, Remedy* and *Up-to-Date* gave the highest yields; the newly-introduced varieties *Red Bad, Saida* and *Siro* yielded from 19.8 to 12.7 tonnes per hectare. As with the 1974 trials, it was apparent that blight control is important when assessing the full potential of varieties. Conditions at Ebène were less favourable, the plots being heavily infected with bacterial wilt. The best yielders were *Remedy, Mariline, Up-to-Date, Désirée* and *Spunta.*

**Table 27. Yields (kg/ha of interrow plantation) of potato varieties at Beau Plan with and without treatment against early and late blight**

| *Variety* | *Treated* | *Untreated* | *% Reduction in yield* |
|---|---|---|---|
| Apollo | 16 583 | 14 126 | 14.8 |
| Cardinal | 18 779 | 13 487 | 28.2 |
| Claudia | 15 774 | 9324 | 40.9 |
| Claustar | 18 967 | 18 594 | 2.0 |
| Compagnon | 2963 | — | — |
| Désirée | 19 074 | 14 893 | 21.9 |
| Mariline | 16 049 | 13 363 | 16.7 |
| Mirka | 12 562 | — | — |
| Red Bad | 19 857 | 15 427 | 22.3 |
| Regale | 15 515 | 12 686 | 18.2 |
| Remedy | 17 046 | 12 989 | 23.8 |
| Rosenant | 11 209 | 11 388 | 0 |
| Saida | 12 739 | 10 089 | 20.8 |
| Siro | 16 814 | 13 897 | 17.3 |
| Spartaan | 12 545 | 11 868 | 5.4 |
| Spunta | 24 002 | 19 785 | 17.6 |
| Up to Date | 17 324 | 13 398 | 22.7 |

In another trial at Beau Plan using tubers obtained from the 1974 trials and stored at 5°C, varieties *Spunta, Arka, Draga, Monitor* and *Cardinal* were the best yielders.

*Date of harvest and yield of* Mariline

In an experiment planted at Réduit in June, harvesting was started seventy days later and thereafter continued at weekly intervals for five weeks. There was a 35% increase in yield between the first and last harvest.

## Seed Potato Production

*Up-to-Date*

Performance tests to assess the incidence of leaf roll and other viruses in seed potato produced locally in 1974 were carried out at Réduit Experiment Station in April. The results are given in Table 28. There was a higher incidence of virus infection in seeds from the Black River district. Potato virus Y was recorded in samples of seed for the first time since the seed potato scheme was launched.

**Table 28. Incidence of leaf roll and other viruses in seed potatoes produced in 1974 as revealed by performance tests.**

| *Origin of seed* | *Mean % leaf roll* | *Mean % other viruses (Y & Aucaba)* |
|---|---|---|
| Anna | 9.8 | 4.2 |
| Beau Champ | 0 | 1.5 |
| Beau Plan | 0 | 0.2 |
| Belle Vue | 0 | 0 |
| Médine | 2.0 | 7.4 |
| Montebello | 0 | 3.4 |
| Rose Belle | 0.3 | 0 |

About 546 tonnes of *Up-to-Date* seed potatoes produced in 1974 were distributed to sugar estates, cooperative growers and the association of young farmers. The locally produced cool-stored seed performed better than imported seed in early and mid-season under optimum moisture conditions. However, owing to the fewer stems produced by the imported seed, crops grown from local seed under dry conditions suffered more from drought and yielded less than those grown from imported seed.

The seed production scheme suffered a severe set-back in 1975 because a large consignment of certified *Up-to-Date* seed imported from South Africa was infected with leaf roll to the extent of 25-30%. Generally, the level of virus infection in South African seed is from 1 to 5%, well within the tolerance standards set up for local multiplication of seed. Several fields earmarked for seed production had, consequently, to be discarded causing a shortfall of some 400 tonnes of seed. Only 225 tonnes of *Up-to-Date* seed could be produced, of which 127 tonnes were derived from imported stock and 98 tonnes from seed once-multiplied locally.

In future most of the 200 tonnes or so of imported South African seed needed annually for multiplication locally is to be obtained from seed produced early in the season, when the risks of virus infection are lowest, and is to be subjected to a performance test. It will be kept in cool store at the Agricultural Marketing Board until required.

The organization of local seed production was improved by setting up a small inspection service under the control of the Plant Pathology Division to ensure proper seed certification. A growers' handbook on seed potato production was published and a course for approved growers was held from the 21st to the 30th April, 1975.

*Selection and bulking up of new varieties*

The main commercial varieties at present are *Up-to-Date*, *King George* and *Delaware*. Over the past six years about sixty varieties have been imported and tested for yielding capacity under local conditions and for reaction to late blight and wilt, both of which are major diseases of potato in Mauritius. Some of the most promising of the new varieties are now being bulked for more extensive testing or for planting on a commercial basis.

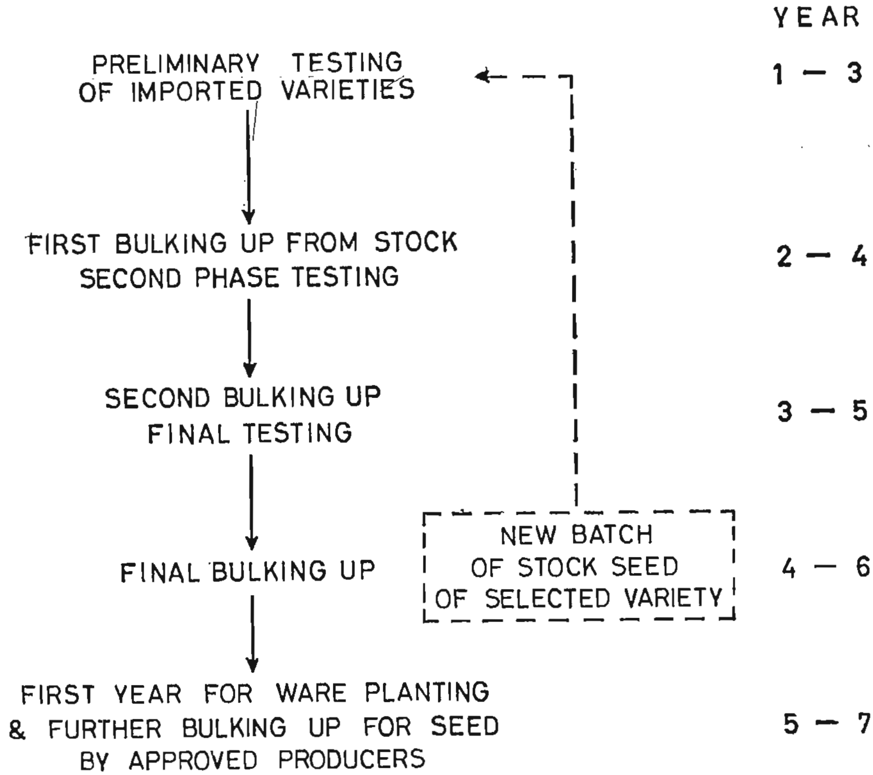


Fig. 12. Scheme for development of new potato varieties at the M.S.I.R.I.

The scheme for the selection and bulking up of potato varieties is illustrated in Fig. 12. Seven varieties have been involved. About 105 tonnes of *Mariline*, which had been bulked over three years, were distributed to growers in 1975 for planting on a trial basis. Although tolerant to wilt and moderately resistant to blight, the performance of the variety has been disappointing in early plantings where germination was poor and growth slow. The cause appears to be physiological, and related to environmental conditions prevailing at the time of early planting. Variety *Désirée*, which has proved too susceptible to scab, is no longer being multiplied. The following amounts of seed were obtained for the other five varieties, which have been bulked for the first time using stock seed from Europe: *Apollo*, 4.3 tonnes; *Cardinal*, 2.3 tonnes; *Regale*, 2.5 tonnes; *Remedy*, 2.7 tonnes; *Spunta*, 1.2 tonnes.

The results of eight trials to compare the behaviour of local seed of *Up-to-Date*, *Désirée* and *Mariline* with that of imported *Up-to-Date* are shown in Table 29.

**Table 29. Yields in tonnes/ha of local seeds of Up-to-Date, Désirée and Mariline and of imported seeds of Up-to-Date**

| | *Savannah* | *Beau Plan* | *Belle Vue* | *Britannia* | *Constance* | *Bel Ombre* | *FUEL* | *Beau Champ* | *Mean* |
|---|---|---|---|---|---|---|---|---|---|
| Imp. U.T.D. | 27.0 | 17.3 | 22.3 | 17.8 | 38.1 | 21.8 | 25.6 | 20.4 | 23.8 |
| LI* U.T.D. | 22.8 | 33.7 | 24.4 | 15.4 | 31.3 | 17.5 | 16.6 | 19.9 | 22.7 |
| LI Désirée | 24.2 | 31.8 | 19.9 | 16.1 | 29.9 | 20.9 | 18.5 | 17.5 | 22.4 |
| LI Mariline | 10.9 | 18.0 | 9.0 | 5.7 | 18.0 | 16.8 | 14.9 | 18.7 | 14.0 |
| LSD P 0.05 | 3.4 | 3.4 | 3.8 | 2.6 | 5.7 | 3.4 | 2.7 | N.S. | |
| P 0.01 | 4.8 | 4.7 | 5.3 | 3.7 | 8.0 | N.S. | 3.8 | N.S. | |

* Local once grown

**Clonal selection of potato seed**

Clonal selection of variety *Mariline* was discontinued, whereas that of variety *Greta*, which cannot be obtained from suppliers overseas, was begun during the year. About 150 plants were screened serologically for viruses X, Y, S and M. About a hundred tubers obtained from healthy plants are to be tested further in 1976 before bulking up as stock seed.

**Diseases**

*Late Blight* (*Phytophthora infestans*)

Late blight appeared rather later than usual and in the drier localities neither early nor late plantings were much affected.

Fifteen potato varieties, five of them newly introduced, were tested for their reaction to the disease in two contrasting localities, Pamplemousses and Union Park. The results were as follows :

| | |
|---|---|
| Resistant to highly resistant | : *Apollo, Draga, Monirot, Prevalent, Remedy, Resonant, Siro, Spartan* |
| Moderately susceptible | : *Cardinal, Claustrar, Désirée, Spunta* |
| Susceptible to highly susceptible | : *Red Bad, Saida, Up-to-Date* |

Fig. 13 shows blight progress curves obtained from another trial in which the five potato varieties selected during the year for eventual large scale planting were compared to *Up-to-Date Désirée* and *Mariline.*

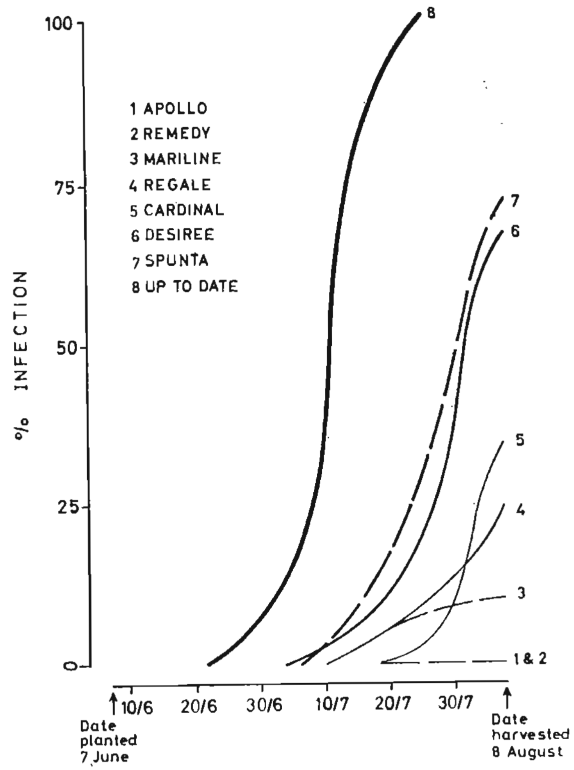


Fig. 13. Comparative blight progress curves for eight potato varieties.

A second series of trials with the new fungicide DPX 3217 from Dupont de Nemours Inc. was conducted at Union Park Experiment Station. Results of two trials are given in Tables 30 and 31. These confirm that a combination of DPX 3217 at 0.19 kg/ha (0.08 kg/arp) and Dithane M-45 at its optimum dosage of 3 kg/ha (1.25 kg/arp) gives more efficient blight control than the latter alone. A higher dosage of DPX 3217 in the combined spray did not improve its efficacy. The combination gave good control under severe blight conditions at a spraying interval of 7 days, whereas a 4-day interval is normally required when Dithane is M-45 used alone.

**Table 30. Effect of combinations of Dithane M-45 and DPX 3217 at different spraying intervals on late blight**

| *Fungicide kg/ha (kg/arp)* | *Spraying intervals (days)* | *% blight at harvest* | *Plot yield** |
|---|---|---|---|
| Dithane M 45 | | | |
| 2.37 (1.0) | 4 | 0.5 | 34.5 |
| + | 7 | 15.7 | 25.9 |
| DPX 3217 | 10 | 93.7 | 12.8 |
| 0.19 (0.08) | | | |
| Dithane M 45 | | | |
| 3 (1.25) | 4 | 0.3 | 36.1 |
| + | 7 | 6.0 | 31.4 |
| DPX 3217 | 10 | 100.0 | 11.8 |
| 0.19 (0.08) | | | |
| Dithane M 45 | | | |
| 3.56 (1.5) | 4 | 0 | 34.3 |
| + | 7 | 2.7 | 28.8 |
| DPX 3217 | 10 | 100.0 | 10.9 |
| 0.19 (0.08) | | | |
| | | 100.0 | 3.0 |
| Control | | 100.0 | 3.6 |
| | | 100.0 | 2.9 |

* Mean of 4 replicates
LSD Plot yield at P 0.05 = 4.4
0.01 = 5.8

**Table 31. Effect of combinations of Dithane M-45 and DPX 3217 at different spraying intervals on late blight**

| *Fungicide (kg/arp (kg/ha)* | *Spraying intervals (days)* | *% blight at harvest* | *Plot yield** |
|---|---|---|---|
| | 4 | 4.0 | 36.7 |
| | 7 | 25.0 | 31.0 |
| Dithane M 45 | 10 | 75.0 | 17.6 |
| 1.25 (3) | 15 | 94.0 | 14.7 |
| Dithane M 45 | 4 | 0.6 | 41.4 |
| 1.25 (3) | 7 | 4.8 | 35.0 |
| + | | | |
| DPX 3217 | 10 | 27.6 | 29.8 |
| 0.08 (0.19) | 15 | 52.0 | 22.2 |
| Dithane M 45 | 4 | 2.4 | 99.8 |
| 1.25 (3) | 7 | 1.3 | 34.8 |
| + | | | |
| DPX 3217 | 10 | 39.0 | 27.3 |
| 0.16 (0.38) | 15 | 84.0 | 20.3 |
| Control | | 100.0** | 5.3 |

* Mean of 5 replicates. LSD at P 0.05 = 13.2
** Reached 100% 7 weeks before harvest

A trial was conducted to determine if the DPX 3217/Dithane M-45 mixture has a curative effect against blight. Plots in which spraying was started after infection had reached 1% were compared to those sprayed as usual, that is, as from the end of the 3rd week after planting. Blight progress curves for the different treatments are given in Fig. 14. There was a rapid build-up of infection in the plots where curative effects were being assessed; as a curative treatment Dithane M-45 alone even at a 4-day spraying interval did not give satisfactory disease control whereas the mixture gave reasonable control. Although DPX 3217 showed some curative effect, preventive treatment is necessary for good control under conditions conducive to heavy blight infection. If treatment is unavoidably late, then the partial curative action of the combined spray may be used to advantage.

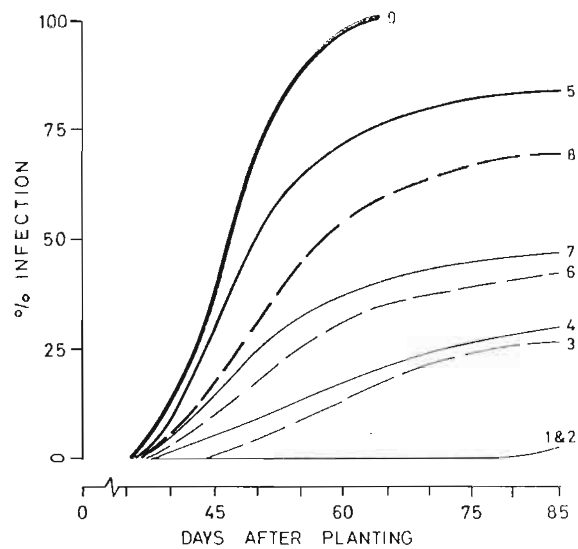


Fig. 14. Progress of blight in potato plots sprayed before and after the start of infection with Dithane M-45 alone or in combination with DPX 3217 at different intervals.

*Preventive treatments* (started on the 27th day)
1. Dithane M-45, 3 kg/hectare every 4 days
2. Dithane M-45, 3 kg/hectare + DPX 3217, 0.2 kg/hectare every 7 days
3. Dithane M-45, 3 kg/hectare + DPX 3217, 0.2 kg/hectare every 10 days
4. Dithane M-45, 3 kg/hectare + DPX 3217, 0.2 kg/hectare every 15 days

*Curative treatments* (started on the 43rd day)

5. Dithane M-45, 3 kg/hectare every 4 days
6. Dithane M-45, 3 kg/hectare + DPX 3217, 0.2 kg/hectare every 7 days
7. Dithane M-45, 3 kg/hectare + DPX 3217, 0.2 kg/hectare every 10 days
8. Dithane M-45, 3 kg/hectare + DPX 3217, 0.2 kg/hectare every 15 days
9. Control

*Bacterial wilt*

Pot experiments to develop a technique for assessing the level of wilt infection in different soils were continued during the year. The method consists of growing tomato plants in soil in pots placed in water so as to maintain water tables at depths of 14 and 25 cm below the soil surface. Soils with two different levels of wilt were taken from fields at Réduit and Pamplemousses where infection in the variety Up-to-Date had reached 22 and 2.5%, respectively. Little difference was observed between the two soils in the pots with the low water table but under the higher moisture regime a faster rate of wilting of tomato plants was observed for the Réduit soil (Fig. 15).

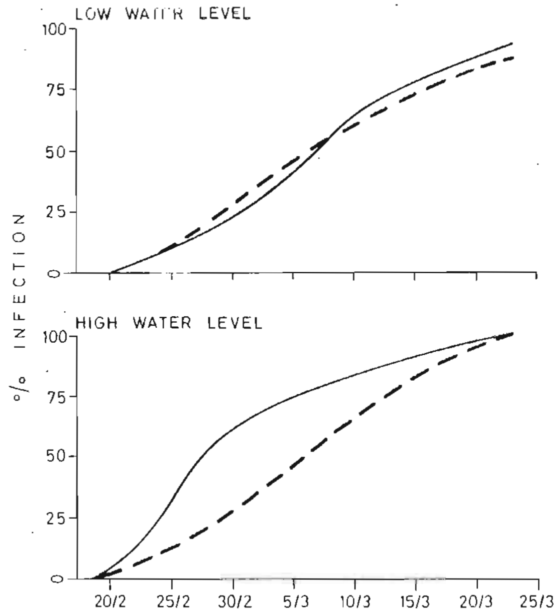


Fig. 15. Progress of bacterial wilt in two soils with different levels of infection under high and low moisture regimes (plain line, Réduit; broken line, Pamplemousses).

In a second experiment no difference in rate of wilting was observed when a heavily contaminated soil was diluted with sterile soil to the extent of 1 : 2 and 1 : 5.

Studies were initiated to determine the duration of viability of the bacterium inside seeds during cool storage.

### Weed control

Four trials were laid down to study the tolerance of potatoes to pre-emergence applications of Linuron, Sencor and Ametryne. As earthing-up breaks the film of herbicide deposited on the soil, earthing-up was done not at four, six and eight weeks as is usual but at six weeks only by which time the potato plant have formed a canopy that restricts weed growth.

Two furrow depths, 15 and 22 cm, were also compared. In the latter, the furrow was only partly filled with soil after planting, but the layer of soil over the seeds remained the same. Earthing-up of the deeper furrow consisted merely of filling it with soil, thereby avoiding erosion of soil over growing tubers as often happens with the orthodox method.

Table 32 gives the different treatments in these experiments.

**Table 32. Herbicidal treatments in potato trials**

| | Treatment | Rate | Earthing-up | Depth of furrows |
|---|---|---|---|---|
| 1. | Hand-weeding | | Earthing-up 4.6 and 8 weeks after planting | depth of furrows 15 cm |
| 2. | Linuron | 3kg a.i./ha | One earthing-up 6 weeks after planting | |
| 3. | Sencor | 1kg a.i./ha | | |
| 4. | Ametryne | 2kg a i /ha | | |
| 5 | Hand-weeding | | | |
| 6. | Control (no weeding) | | | |
| 7. | Linuron | 3kg a.i./ha | | depth of furrows 22 cm |
| 8. | Sencor | 1kg a.i./ha | | |
| 9. | Ametryne | 2kg a.i./ha | | |
| 10. | Hand-weeding | | | |
| 11. | Control (no weeding) | | | |

Yield figures were obtained from only one of the trials, located at Beau Plan, where the potatoes were planted in interrows of sugar cane. Weed infestation was poor. The differences between treatments were small and not significant. The three other trials suffered severely from disease but no visual difference in growth was apparent between the different treatments. Further trials are planned for 1976.

## GROUNDNUT

### Variety trials

Trials were continued to compare the performance of high-yielding Spanish-type varieties from Taïwan and Virginia-type varieties with the *Cabri* variety. Table 33 shows that the yields of these varieties were as good as that of *Cabri*. Among the Virginia-type varieties tested, the sister-lines of *Shulamit* gave promising high yields.

**Table 33. Results of groundnut variety trials at Réduit and Pamplemousses**

| Variety | Yield of in-shell nuts at 8% moisture content (kg/ha) | |
|---|---|---|
| | *Reduit* | *Pamplemousses* |
| *Spanish-type* | | |
| Cabri | 3865 | 4896 |
| Nan Kai 76 | 3958 | 4899 |
| Nung Yu 922 | 4527 | 5005 |
| Nung Yu 991 | 3681 | 4790 |
| Nung Yu 1137 | 4114 | 4792 |
| Tai Nan Selection 3 | 3647 | 5107 |
| Nai Tan Selection 9 | 3953 | 4728 |
| 61-24 | 3427 | 4995 |
| *Virginia-type* | | |
| Shulamit | 3396 | 4994 |
| Ac. 15714 | 3444 | 5247 |
| Ac. 15753 | 4598 | 5162 |
| Ac. 15754 | 3325 | 4994 |
| Ac. 15755 | 4494 | 4941 |

**Diseases**

Although not observed in Mauritius for many years, an outbreak of groundnut rust (*Puccinia arachidis*) occurred in September and by the end of the year had reached epidemic proportions.

*Cercospora* leaf spot and mud spot (*Mycosphaerella argentinensis*) have been the most damaging diseases of groundnut during the past five years and these only appear after the onset of summer rains, so that plantations established during the dry season are little affected. Rust unfortunately seems to start earlier and could prove troublesome even to plantations established during the dry season.

Rust appears to be more damaging than *Cercospora* leaf spot. Benlate sprays are not effective against it and investigations are in progress to determine the best fungicide or fungicide mixture for controlling the disease alone or in the presence of the other leaf spot diseases.

## SOYA BEANS

**Date-of-planting trials**

Many varieties of soya bean are unsuitable for the tropics because of their sensitivity to photoperiodism and high temperatures. The most promising varieties of the 1974 trials (Ann. Rept. for 1974) were used in a date-of-planting trial. The plantings were started on 10th April and continued at 15 day intervals until 25th June.

Observations showed that small changes in photoperiod and temperature markedly affected vegetative growth and maturity of the varieties.

## FRENCH BEANS AND PEAS

Efforts to find varieties of French beans and peas suitable for cultivation in sugar cane interrows were continued.

The most promising bean varieties were : *Canadian Wonder* and *Long Tom* (green and stringed) *Processor* and *Tenor* (green and stringless), *Beurre Purenel* and *Tezier d'Or* (yellow and stringless) (Table 34).

**Table 34. Promising varieties of French bean planted at Réduit in July 1975**

| Variety | No. of days to 1st flower | No. of days to last harvest | Yield (kg/ha) |
|---|---|---|---|
| | *Green beans (with strings)* | | |
| Canadian Wonder | 36 | 86 | 21 901 |
| Long Tom | 39 | 87 | 15 633 |
| Local Red | 39 | 80 | 13 033 |
| | *Green beans (stringless)* | | |
| Processor | 39 | 86 | 18 894 |
| Tenor | 39 | 80 | 17 495 |
| Sensation | 39 | 80 | 15 775 |
| Top Crop | 39 | 80 | 14 649 |
| | *Yellow (Butter) beans (stringless)* | | |
| Beurre Purenel | 39 | 86 | 16 953 |
| Tezier d'Or | 39 | 80 | 14 931 |
| Beurre de Roquencourt | 41 | 86 | 14 684 |

The best pea varieties were : (i) "Dwarf" varieties (suitable for planting in virgin cane inter-rows) : *Meteor*, *Kelvedon Wonder* and *Pioneer* (ii) "Tall" varieties: *Telephone*, *Thomas Laxton* and *Alaska* (Table 35).

**Table 35. Promising varieties of French peas planted at Reduit in July 1975**

| Variety | No. of days to 1st flower | No. of days to last harvest | Average plant height (cm) | Yield of green peas (kg/ha) |
|---|---|---|---|---|
| | | *"Dwarf" varieties* | | |
| Meteor | 29 | 73 | 39 | 7622 |
| Kelvedon Wonder | 29 | 73 | 37 | 7399 |
| Pioneer | 29 | 82 | 51 | 7245 |
| Progress no. 9 | 32 | 82 | 41 | 7048 |
| Dark Green Perfection | 42 | 82 | 42 | 5916 |
| Chemin Long | 33 | 76 | 42 | 5387 |
| | | *"Tall" varieties* | | |
| Telephone | 30 | 82 | 103 | 10 573 |
| Thomas Laxton | 29 | 72 | 74 | 9333 |
| Alaska | 28 | 82 | 77 | 8250 |
| "Local" | 51 | 92 | 103 | 5541 |

*Weed control in beans*

Two trials were conducted to study the effect of various herbicidal treatments on germination, growth and yield of green beans. Both experiments — one at Deep River and the other at Pamplemousses — were overhead-irrigated and spraying of herbicides took place the day after the first irrigation. The different treatments and the yields of green beans in the trials are given in Table 36. Apart from the Sencor-treated plots, where germination and growth were severely impaired, yields in the treated plots were not inferior to those in the hand-weeded plots; on the whole they were superior, but not significantly so.

**Table 36. Herbicidal treatments in green beans. Yields are from 20 m² plots and are means of four replicates**

| *Treatment* | *Dosages (kg a.i./ha)* | *Yields (kg)* Deep River (var. Top Crop) | *Pamplemousses (var. Local Red)* |
|---|---|---|---|
| Linuron | 2.0 | 24.8 | 14.8 |
| Cobex | 1.0 | 25.9 | 13.3 |
| Patoran | 1.0 | 22.8 | 13.7 |
| Patoran | 2.0 | 25.2 | 12.9 |
| Prometryne | 2.0 | 22.2 | 11.8 |
| Sencor | 0.5 | 4.4 | — |
| Preforan | 2.0 | 24.6 | 14.8 |
| Tribunil | 2.0 | 21.1 | 13.7 |
| Tribunil | 3.0 | 21.3 | 14.1 |
| Hand-weeding | | 20.4 | 12.6 |

*Weed control in peas*

Two experiments laid down in peas gave satisfactory results in that most of the herbicidal treatments tested did no harm to the crop. The differences in yield were not significant but the weed control obtained was certainly better in the plots treated with Linuron and Preforan. Table 37 shows the treatments used and the yields obtained in the trials.

**Table 37. Herbicidal treatments in peas (var. Dark Skin Perfection). Yields are from 20 m$^2$ plots and are means of four replicates**

| *Treatments* | *Dosages (kg a.i./ha)* | *Yields (kg)* | |
|---|---|---|---|
| | | *Deep River* | *Savannah* |
| Linuron | 2.0 | 6.1 | 8.0 |
| Cobex | 1.0 | 6.4 | 7.8 |
| Tribunil | 2.0 | 5.9 | 8.1 |
| Tribunil | 3.0 | 5.9 | 8.0 |
| Preforan | 2.0 | 7.1 | 8.1 |
| Patoran | 1.0 | 5.6 | 7.9 |
| Patoran | 2.0 | 5.0 | 6.9 |
| Hand-weeding | | 5.4 | 7.6 |

## RICE

Investigations on the planting of rice in interrows of ratoon canes were started in 1975. Rice varieties *TN 1*, *YRL*, *IR 420* were planted at FUEL and Belle Vue Mauricia respectively. Observations on growth of cane and rice indicated that earlier maturing rice varieties would be needed for successful cultivation in cane interrows.

## CARROTS

### Weed control

Of the two trials carried out in this crop, one had to be abandoned owing to bad germination. The other gave promising results (Table 38). Sencor at 0.25 kg/ha was applied in post emergence and did not affect yields significantly by comparison with hand-weeding. All other herbicide treatments were applied in pre-emergence and all resulted in significantly greater yields. The difference between Linuron and Sencor at 1.0 kg/ha was also significant.

**Table 38. Herbicidal treatments in carrots. Yields are from 20 m$^2$ plots and are means of four replicates**

| *Treatments* | *Dosages (kg a.i./ha)* | *Yields (kg) (without leaves)* |
|---|---|---|
| Sencor | 0.25 | 68.1 |
| Sencor | 0.50 | 77.2* |
| Sencor | 1.00 | 72.4* |
| Prometryne | 2.00 | 76.9* |
| Linuron | 2.00 | 83.3* |
| Hand-weeding | | 63.2 |

* Significant increase in yield over hand-weeding at P = 0.05

Sencor at 1.0 kg/ha slightly affected germination and growth. In post-emergence, it did not visibly affect growth and the lesser yield that resulted, compared to the other herbicidal treatments, may have been due to the competitive effect of weed growth before treatment or to delayed thinning-out. Subsequent observations on post-emergence treatment at the same rates used in the trials showed no phytotoxicity when applied at the cotyledon, first-leaf and second-leaf stages.

# 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 | = | 10 000 (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, 1971 - 1975**
*(in thousand ha)*

| Year | Area under cane Island | Area harvested | | | | | |
|---|---|---|---|---|---|---|---|
| | | Island | West | North | East | South | Centre |
| 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 |
| 1975 | 86.39 | 80.17 | 5.30 | 21.10 | 19.75 | 23.91 | 10.11 |

**Table II. Sugar production 1971 - 1975**
*(in thousand tonnes)*

| Crop Year | No. of factories operating | Av. Pol. | Island | West | North | East | South | Centre |
|---|---|---|---|---|---|---|---|---|
| 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 |
| 1975 | 21 | 98.7 | 468.3 | 38.1 | 106.2 | 114.3 | 150.5 | 59.2 |

**Table III. Yield of cane, 1971 - 1975**
*(in tonnes/ha)*

| SECTORS | 1971 | 1972 | 1973 | 1974 | 1975 |
|---|---|---|---|---|---|
| ISLAND | | | | | |
| Miller-Planters | 79.9 | 90.0 | 88.4 | 87.9 | 63.0 |
| Planters* | 49.5 | 65.5 | 64.0 | 58.3 | 42.7 |
| Average | 65.9 | 78.7 | 77.0 | 74.7 | 53.8 |
| WEST | | | | | |
| Miller-Planters | 83.0 | 94.3 | 97.6 | 88.2 | 71.1 |
| Planters* | 51.2 | 66.7 | 72.5 | 57.1 | 46.0 |
| Average | 68.7 | 82.0 | 86.5 | 74.9 | 60.4 |
| NORTH | | | | | |
| Miller-Planters | 65.6 | 91.7 | 90.8 | 88.9 | 63.0 |
| Planters* | 39.1 | 65.6 | 64.7 | 53.1 | 38.9 |
| Average | 48.8 | 75.4 | 74.4 | 66.6 | 48.1 |
| EAST | | | | | |
| Miller-Planters | 84.4 | 94.3 | 87.9 | 92.4 | 65.2 |
| Planters* | 51.4 | 63.0 | 59.5 | 60.2 | 42.8 |
| Average | 68.7 | 79.3 | 74.2 | 77.3 | 54.7 |
| SOUTH | | | | | |
| Miller-Planters | 80.1 | 87.5 | 87.5 | 84.6 | 61.8 |
| Planters* | 60.4 | 67.8 | 67.3 | 61.9 | 46.2 |
| Average | 73.0 | 81.3 | 81.3 | 78.0 | 57.3 |
| CENTRE | | | | | |
| Miller-Planters | 87.9 | 84.8 | 83.4 | 88.6 | 57.3 |
| Planters* | 56.9 | 65.9 | 61.6 | 65.2 | 46.4 |
| Average | 75.1 | 76.7 | 73.9 | 78.7 | 52.8 |

* *Inclusive of tennant planters*

**Table IV. Average sucrose % cane, 1971 - 1975**

| Crop year | Island | West | North | East | South | Centre |
|---|---|---|---|---|---|---|
| 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 | 13.26 | 14.23 | 13.24 | 13.24 | 13.26 | 12.80 |
| 1975 | 12.56 | 13.39 | 12.33 | 12.26 | 12.67 | 12.80 |

**Table V. Yield of sugar, 1971 - 1975**

*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 |
| 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 | 9.91 | 8.74 | 10.66 | 9.50 | 8.82 | 7.75 | 10.23 | 8.96 | 10.34 | 9.22 | 10.07 | 8.96 |
| 1975 | 6.76 | 5.85 | 8.09 | 7.06 | 5.93 | 5.06 | 6.71 | 5.79 | 7.26 | 6.31 | 6.76 | 5.95 |

**Table VI. Monthly rainfall (mm), 1971 - 1975**

*(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<br>335 | 44<br>1138 | 68<br>825 | 66<br>915 | 85<br>990 | 37<br>701 | 41<br>544 | 25<br>419 | 41<br>260 | 15<br>318 | 18<br>205 | 9<br>250 |
| 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 |
| 1975 | *38* | *133* | *139* | *486* | *176* | *154* | 292 | *118* | 81 | 815 | *108* | 27 |

**Table VII. Monthly air temperatures (°C), 1971 - 1975**

*(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 |
| 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 |
| 1975 | 28.3 | 19.3 | 29.4 | 20.9 | 29.8 | 22.2 | 29.8 | 22.4 | 28.8 | 22.0 | 28.4 | 22.2 | 27.0 | 19.1 | 24.6 | 18.6 | 24.2 | 18.0 | 23.3 | 17.4 | 23.8 | 17.6 | 25.7 | 17.8 |

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

*(average over Mauritius)*

| Crop year | 1960 | 1971 | 1972 | 1973 | 1974 | 1975 |
|---|---|---|---|---|---|---|
| November | 31 | 29 | 27 | **56** | 26 | 26 |
| December | 24 | 34 | 27 | 31 | 25 | 25 |
| January | **85** | 32 | 29 | 36 | 30 | 28 |
| February | **119** | 43 | **60** | 30 | 28 | **114** |
| March | 24 | 26 | 45 | 34 | 31 | 49 |
| April | 24 | 26 | 29 | 28 | 29 | 31 |
| May | 27 | 27 | 32 | 22 | 25 | 31 |

*NOTE :* Cyclonic winds over 50 km/h 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 *Eugenie* | 61 | 63 | 43 | 80 | 56 |
| November 1972 *Ariane* | 48 | 64 | 63 | 54 | 48 |
| February 1975 *Gervaise* | 124 | 93 | 120 | 124 | 107 |
| March 1975 *Inès* | 50 | 41 | 50 | 65 | 41 |

## Table X. Cane Varieties, 1968 - 1975

*(% area cultivated on estate lands)*

| | M 134/32 (1937) | Ebène 1/37 (1951) | B 37172 (1953) | M 147/44 (1955) | M 31/45 (1955) | M 202/46 (1959) | M 93/48 (1959) | M 253/48 (1961) | Ebène 50/47 (1962) | 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) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1968 | 2 | 4 | 5 | 19 | 6 | 14 | 19 | 2 | 5 | 9 | 1 | 1 | 1 | 3 | 1 | — | — | — | — |
| 1969 | 1 | 2 | 3 | 15 | 6 | 15 | 21 | 2 | 4 | 10 | 1 | 1 | 1 | 6 | 3 | — | — | — | — |
| 1970 | 1 | 1 | 2 | 12 | 6 | 12 | 21 | 2 | 3 | 10 | 1 | 1 | 1 | 8 | 8 | 2 | 4 | — | — |
| 1971 | 1 | 1 | 1 | 7 | 6 | 11 | 20 | 1 | 2 | 10 | 1 | 1 | 1 | 11 | 8 | 4 | 10 | — | — |
| 1972 | — | — | 1 | 3 | 5 | 10 | 18 | 1 | 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 |
| 1975 | — | — | — | — | 3 | 3 | 12 | — | — | 3 | — | — | 1 | 22 | 13 | 4 | 31 | 2 | 2 |

NOTE : Year of approval by Cane Release Committee in brackets

## Table XI. Cane varieties on miller-planters' land 1971-1975

*(% annual plantation)*

| Year / Varieties | Island | | | | | West | | | | | North | | | | | East | | | | | South | | | | | Centre | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1971 | 1972 | 1973 | 1974 | 1975 | 1971 | 1972 | 1973 | 1974 | 1975 | 1971 | 1972 | 1973 | 1974 | 1975 | 1971 | 1972 | 1973 | 1974 | 1975 | 1971 | 1972 | 1973 | 1974 | 1975 | 1971 | 1972 | 1973 | 1974 | 1975 |
| M 31/45 ... | 2.0 | 1.6 | 0.7 | 2.2 | 1.9 | 0.8 | — | — | — | — | 1.8 | — | — | — | — | 5.2 | 5.2 | 2.8 | 7.9 | 5.6 | 0.8 | 0.1 | 0.4 | 1.6 | 1.6 | 0.4 | 2.0 | — | — | — |
| M 202/46 ... | 0.7 | 0.1 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 1.8 | 0.3 | — | — | — | — | — | — | — | — |
| M 93/48 ... | 9.9 | 8.8 | 3.9 | 6.8 | 7.8 | — | — | — | — | — | — | — | — | — | — | 2.7 | 1.6 | — | 2.2 | 1.0 | 11.5 | 7.5 | 3.0 | 3.3 | 5.9 | 40.7 | 36.1 | 19.9 | 33.9 | 41.4 |
| M 442/51 ... | 0.5 | 0.4 | 0.9 | — | — | — | — | — | — | — | 1.0 | 0.9 | 0.8 | — | — | 0.5 | — | — | — | — | 0.5 | 0.6 | — | — | — | — | — | — | — | — |
| M 356/53 ... | — | — | — | — | 1.3 | — | — | — | — | — | — | — | — | — | 0.3 | — | — | — | — | — | — | — | — | — | 2.8 | — | — | — | — | 0.9 |
| M 13/56 ... | 25.8 | 25.1 | 23.3 | 24.6 | 22.3 | 19.1 | 17.5 | 14.6 | 13.5 | 5.0 | 56.9 | 63.3 | 44.9 | 35.6 | 36.0 | 19.1 | 13.7 | 21.4 | 24.1 | 20.3 | 24.6 | 25.6 | 22.9 | 30.5 | 26.8 | — | 1.1 | — | — | — |
| M 377/56 ... | — | 3.0 | 2.0 | 19.7 | 31.1 | — | 18.0 | 10.0 | 43.5 | 66.3 | — | 2.7 | 2.0 | 36.1 | 43.1 | — | 5.4 | 1.5 | 20.8 | 33.6 | — | — | 0.5 | 10.9 | 21.4 | — | — | 2.9 | 9.7 | 20.0 |
| M 351/57 ... | 8.7 | 2.4 | 1.7 | 1.7 | 0.4 | 2.0 | 7.8 | 2.2 | 6.0 | 0.5 | 2.2 | 1.2 | 2.7 | 3.0 | 1.9 | 6.2 | 0.6 | 0.2 | 0.2 | — | 10.3 | 3.8 | 1.2 | 0.5 | — | 23.3 | 6.9 | 3.3 | 4.1 | — |
| N Co 376 ... | 0.1 | 0.2 | — | — | 0.2 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.3 | 0.5 | — | — | 0.6 | — | — | — | — | — |
| S 17 ... | 48.2 | 47.0 | 50.1 | 36.0 | 30.0 | 67.1 | 50.8 | 49.9 | 35.3 | 24.5 | 37.2 | 26.9 | 37.3 | 19.1 | 15.9 | 61.7 | 54.6 | 54.3 | 41.3 | 38.3 | 47.0 | 54.9 | 58.1 | 40.4 | 31.9 | 29.8 | 38.6 | 44.8 | 39.3 | 34.7 |
| M 124/59 ... | 1.7 | 5.4 | 8.2 | 3.0 | 0.4 | 2.7 | — | 9.5 | 0.1 | — | — | — | 0.6 | 1.5 | 0.3 | 1.0 | 9.5 | 3.8 | 0.5 | — | 1.9 | 4.5 | 9.5 | 3.7 | 0.7 | 0.4 | 10.0 | 22.4 | 7.8 | — |
| M 438/59 ... | — | 2.7 | 7.6 | 2.2 | 0.4 | — | — | 9.6 | 0.4 | — | — | 2.4 | 10.5 | 2.7 | — | — | 7.7 | 15.2 | 1.1 | — | — | 0.4 | 2.6 | 2.3 | 0.4 | — | 2.6 | 5.5 | 3.3 | 1.7 |
| B 51129 ... | — | — | — | — | 0.7 | — | — | — | — | 1.2 | — | — | — | — | 0.3 | — | — | — | — | 0.2 | — | — | — | — | 1.2 | — | — | — | — | 0.2 |
| Other varieties | 2.4 | 2.3 | 1.6 | 3.8 | 3.5 | 8.3 | 5.9 | 4.2 | 1.2 | 2.5 | 0.9 | 2.6 | 1.2 | 2.0 | 2.2 | 3.6 | 1.7 | 0.8 | 1.9 | 1.0 | 1.3 | 1.8 | 1.8 | 6.8 | 6.7 | 5.4 | 2.7 | 1.2 | 1.9 | 1.1 |
| Total area planted (ha.) | 6317 | 6139 | 5678 | 5263 | 5229 | 521 | 458 | 435 | 310 | 341 | 1143 | 1070 | 1214 | 1028 | 1026 | 1445 | 1369 | 1121 | 1117 | 1150 | 2466 | 2279 | 2095 | 2020 | 2041 | 742 | 963 | 813 | 788 | 671 |

**Table XII. Area harvested and yields, 1975 crop**

*A = area, ha*

*B = yields, tonnes/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 | 3373 | 83.6 | 264 | 94.8 | 874 | 78.7 | 832 | 75.6 | 1121 | 89.6 | 282 | 88.8 |
| (ii) Petite Saison | 1396 | 70.8 | 58 | 75.1 | 104 | 64.9 | 179 | 78.2 | 673 | 69.9 | 382 | 70.1 |
| 1st Ratoon | 5841 | 62.8 | 411 | 74.6 | 1120 | 65.9 | 1413 | 66.6 | 2076 | 61.6 | 821 | 49.5 |
| 2nd ,, | 6220 | 60.7 | 432 | 72.5 | 1165 | 64.0 | 1406 | 62.3 | 2290 | 59.0 | 927 | 52.4 |
| 3rd ,, | 6290 | 59.0 | 426 | 65.6 | 1168 | 60.2 | 1508 | 59.7 | 2455 | 58.3 | 733 | 52.4 |
| 4th ,, | 6057 | 61.4 | 372 | 66.6 | 961 | 60.9 | 1455 | 63.7 | 2383 | 60.6 | 886 | 57.3 |
| 5th ,, | 5721 | 64.2 | 338 | 64.7 | 1064 | 64.2 | 1328 | 68.7 | 2182 | 62.3 | 809 | 61.6 |
| 6th ,, | 4607 | 61.1 | 210 | 68.9 | 812 | 60.7 | 1187 | 63.2 | 1874 | 60.2 | 524 | 56.6 |
| Older ratoons | 4726 | 58.6 | 542 | 66.3 | 741 | 61.6 | 1244 | 62.3 | 1770 | 53.5 | 428 | 54.0 |
| Total Miller-Planters | 44 231 | 63.0 | 3053 | 70.8 | 8009 | 64.4 | 10 552 | 65.2 | 16 825 | 61.8 | 5792 | 57.6 |
| Total Owner-Planters | 33 734 | 43.1 | 2249 | 46.0 | 13 083 | 38.9 | 8198 | 44.3 | 5977 | 47.9 | 4227 | 46.9 |
| Total Tenant-Planters | 2211 | 34.1 | — | — | 9 | 40.5 | 998 | 31.5 | 1112 | 37.0 | 92 | 31.0 |
| Grand Total | 80 176 | 53.8 | 5302 | 60.4 | 21 101 | 48.1 | 19 748 | 54.7 | 23 914 | 57.3 | 10 111 | 52.8 |

**Table XIII. Evolution of Cane Quality 1975 Crop**
*(Sucrose % Cane)*

| Week ending | Island | West | North | East | South | Centre |
|---|---|---|---|---|---|---|
| 19th July | 11.84 | — | 11.80 | 11.80 | 11.92 | 11.56 |
| 26th ,, | 11.96 | 13.47 | 12.07 | 11.90 | 11.96 | 12.49 |
| 2nd August | 12.29 | 13.49 | 11.86 | 12.14 | 12.28 | 12.55 |
| 9th ,, | 12.48 | 13.79 | 12.16 | 12.36 | 12.38 | 12.75 |
| 16th ,, | 12.67 | 13.61 | 12.33 | 12.50 | 12.70 | 13.00 |
| 23rd ,, | 12.50 | 13.79 | 12.11 | 12.29 | 12.52 | 12.86 |
| 30th ,, | 12.60 | 13.90 | 12.19 | 12.38 | 12.65 | 12.83 |
| 6th September | 12.73 | 13.84 | 12.21 | 12.54 | 12.90 | 12.98 |
| 13th ,, | 12.86 | 13.86 | 12.40 | 12.53 | 13.05 | 13.23 |
| 20th ,, | 12.62 | 13.51 | 12.26 | 12.29 | 12.88 | 12.75 |
| 26th ,, | 12.68 | 13.77 | 12.29 | 12.37 | 12.88 | 12.82 |
| 4th October | 12.65 | 13.67 | 12.38 | 12.24 | 12.84 | 12.76 |
| 11th ,, | 12.66 | 13.52 | 12.37 | 12.18 | 12.98 | 12.78 |
| 18th ,, | 12.72 | 13.31 | 12.55 | 12.41 | 12.98 | 12.74 |
| 25th ,, | 12.89 | 13.43 | 12.66 | 12.71 | 13.09 | 12.91 |
| 31st ,, | 12.97 | 13.30 | 13.00 | 12.71 | 13.00 | 13.05 |
| 8th November | 12.65 | 12.74 | 12.71 | 12.23 | 12.81 | 12.86 |
| 15th ,, | 12.68 | 12.63 | 12.76 | 12.50 | 12.72 | 12.72 |
| 22nd ,, | 12.56 | 12.68 | 12.30 | 12.26 | 12.69 | 13.14 |
| 29th ,, | 12.40 | 12.50 | 12.07 | 12.22 | 12.57 | 12.64 |
| 6th December | 12.40 | 12.95 | 11.86 | 12.04 | 12.70 | 11.62 |
| 13th ,, | 12.33 | 12.76 | 12.14 | 11.86 | 12.64 | — |
| 20th ,, | 12.44 | 13.02 | 12.33 | 12.03 | 13.17 | — |

**Table XIV. Comparative mid-harvest dates 1971 - 1975**
*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 |
| 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 |
| 1975 | 24/9 | 373 | 5/10 | 378 | 23/9 | 371 | 22/9 | 372 | 24/9 | 368 | 15/9 | 369 |

**Table XV. Summary of chemical control data 1975**

(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 | 23/7 | 18/7 | 18/7 | 4/7 | 15/7 | 24/7 | 31/7 | 4/7 | 27/6 | 3/7 | 7/7 | 28/6 | 27/6 | 4/7 | 3/7 | 18/7 | 16/7 | 15/7 | 22/7 | 17/7 | 7/7 | — |
| | To | 17/12 | 17/11 | 31/10 | 18/12 | 15/11 | 19/11 | 17/12 | 22/12 | 23/12 | 20/12 | 17/12 | 20/12 | 16/12 | 26/11 | 5/12 | 18/12 | 2/12 | 1/12 | 3/12 | 26/11 | 14/11 | — |
| | No. of crushing days | 119 | 95 | 85 | 131 | 93 | 89 | 110 | 135 | 140 | 137 | 124 | 139 | 128 | 108 | 121 | 120 | 110 | 108 | 105 | 102 | 99 | 118 |
| | Net crushing hours per day | 19.47 | 18.47 | 21.58 | 17.13 | 17.98 | 15.91 | 17.00 | 15.00 | 17.54 | 16.64 | 15.51 | 14.31 | 17.43 | 16.40 | 16.14 | 17.52 | 18.66 | 16.05 | 16.00 | 16.76 | 17.55 | 16.78 |
| | Hours stoppages per day | 1.35 | 0.28 | 0.53 | 0.61 | 0.35 | 1.14 | 0.97 | 0.24 | 0.59 | 0.21 | 0.38 | 0.12 | 0.17 | 1.03 | 0.46 | 2.11 | 0.83 | 0.84 | 0.20 | 0.23 | 0.39 | 0.62 |
| | Overall time efficiency | 79.8 | 77.0 | 89.9 | 71.4 | 74.9 | 66.3 | 70.8 | 62.5 | 73.1 | 69.3 | 64.6 | 59.6 | 72.6 | 68.3 | 67.3 | 73.0 | 77.8 | 66.9 | 66.7 | 69.8 | 73.1 | 69.9 |
| | Mechanical time efficiency | 93.5 | 98.5 | 97.6 | 96.6 | 98.1 | 93.3 | 94.6 | 98.4 | 96.7 | 98.8 | 97.6 | 99.1 | 99 0 | 94.1 | 97.3 | 89.2 | 95.7 | 95.0 | 98.8 | 98.7 | 97.8 | 96.4 |
| CANE CRUSHED (Tonnes) | Factory | 222 980 | 37 035 | 48 971 | 129 643 | 89 998 | 66 565 | 133 837 | 124 527 | 337 620 | 225 456 | 171 440 | 164 617 | 157 050 | 112 040 | 104 635 | 214 250 | 47 016 | 71 053 | 93 253 | 95 567 | 138 827 | 2 786 380 |
| | Planters | 103 326 | 98 398 | 99 120 | 55 715 | 93 145 | 77 826 | 82 072 | 93 971 | 201 136 | 99 372 | 33 821 | 31 723 | 63 382 | 43 021 | 47 707 | 2 510 | 63 509 | 41 263 | 56 438 | 59 493 | 82 699 | 1 529 647 |
| | Total | 326 306 | 135 433 | 148 091 | 185 358 | 183 143 | 144 391 | 215 909 | 218 498 | 538 756 | 324 828 | 205 261 | 196 340 | 220 432 | 155 061 | 152 342 | 216 760 | 110 525 | 112 316 | 149 691 | 155 060 | 221 526 | 4 316 027 |
| | Factory % total | 68.3 | 27.3 | 33.1 | 69.9 | 49.1 | 46.1 | 62.0 | 57.0 | 62.7 | 69.4 | 83.5 | 83.8 | 71.2 | 72.3 | 68.7 | 98.8 | 42.5 | 63.3 | 62.3 | 61.6 | 62.7 | 64.6 |
| | Per day | 2742 | 1426 | 1742 | 1415 | 1969 | 1622 | 1963 | 922 | 3848 | 2371 | 1655 | 1413 | 1722 | 1436 | 1259 | 1806 | 1005 | 1040 | 1426 | 1520 | 2238 | 1740 |
| | Per hour actual crushing | 140.8 | 77.2 | 80.7 | 82.6 | 109.5 | 102.0 | 115 4 | 107 9 | 219 4 | 142.5 | 106.7 | 98.7 | 99.8 | 87.6 | 78.0 | 103.1 | 53.8 | 64.8 | 89.1 | 90.7 | 127.5 | 103.7 |
| PERCENTAGE VARIETIES CRUSHED (Factory) | S 17 | 37.9 | 24.6 | 18.5 | 18.5 | 33.6 | 22.7 | 12.0 | 36.4 | 39.4 | 31.9 | 30.2 | 16.9 | 30.3 | 27.8 | 25.1 | 45.9 | 27.7 | 45.5 | 30.6 | 40.9 | 14.9 | 30.6 |
| | M 13/56 | 14.5 | 44.1 | 36.1 | 42.9 | 32.4 | 47.9 | 64.0 | 30.0 | 8.3 | 21.8 | 28.7 | 52.2 | 35.5 | 2.5 | 2.8 | 14.0 | 34.2 | 26.7 | 6.8 | 2.1 | 0.7 | 23.5 |
| | M 377/56 | 19.7 | 19.0 | 25.4 | 17.9 | 17.0 | 16.6 | 9.8 | 23.0 | 15.0 | 7.6 | 9.8 | 12.7 | 11.5 | 7.6 | 11.5 | 15.0 | 13.2 | 8.9 | 10.1 | 11.1 | 10.1 | 13.5 |
| | M 93/48 | 0.1 | — | — | 4.2 | — | — | — | 0.6 | 13.7 | 5.7 | 0.6 | 4.0 | 7.7 | 27.6 | 33.0 | 10.0 | 5.5 | — | 21.9 | 31.1 | 61.3 | 11.2 |
| | M 351/57 | 4.3 | 2.5 | 0.1 | 5.5 | — | 0.2 | — | 0.3 | 3.1 | 2.2 | 12.5 | 1.7 | 3.0 | 9.1 | 7.7 | 2.3 | 6.3 | 0.2 | 12.1 | 1.1 | 5.2 | 3.9 |
| | M 31/45 | 0.1 | — | 0.9 | 0.3 | — | 0.5 | 1.0 | 2.7 | 10.3 | 11.9 | 1.2 | 0.3 | 2.5 | 4.0 | 2.9 | 2.3 | 4.6 | 0.5 | 2.2 | — | — | 3.3 |
| | M 202/46 | 8.5 | 2.4 | 3.3 | 0.7 | — | 0.3 | — | 0.2 | 0.1 | 7 1 | 1.8 | 2.8 | 4.2 | 13.6 | 3.2 | 1.0 | — | 2.5 | 2.6 | — | — | 2.8 |
| | M 442/51 | 4.9 | 1.8 | 5.7 | 6.2 | 5.9 | 7.3 | 10.4 | 2.1 | 0.3 | 3.1 | 3.7 | 4.2 | 0.7 | — | — | 1.5 | 1.2 | 4.2 | 0.2 | — | — | 2.8 |
| | M 124/59 | 1.4 | 0.8 | 0.2 | 0.2 | — | 1.1 | — | 0.1 | 2.1 | 2.4 | 3.2 | 0.5 | 1.7 | 5.0 | 4.0 | 1.2 | 1.3 | 0.6 | 4.7 | 6.0 | 6.1 | 2.1 |
| | M 438/59 | 1.7 | 0.7 | 2.6 | 2.0 | 8.7 | 1.4 | 0.5 | 3.2 | 4.1 | 1.6 | 0.7 | 0.5 | 0.4 | 0.1 | 0.7 | 0.4 | 1.0 | 4.2 | 1.8 | 2.9 | 1.0 | 1.9 |
| | Other varieties | 6.9 | 4.1 | 7.2 | 1.6 | 2.4 | 2.0 | 2.3 | 1.4 | 3.6 | 4.7 | 7.6 | 4.2 | 2.5 | 2.7 | 9.1 | 6.4 | 5.0 | 6.7 | 7.4 | 4.8 | 0.7 | 4.4 |
| SUGAR PRODUCED (Tonnes) | Raw sugar | 38 084 | 14 385 | 16 229 | 18 904 | 12 748 | 8313 | 23 000 | 23 573 | 50 844 | 27 127 | 21 217 | 22 460 | 26 081 | 16 697 | 17 243 | 23 746 | 11 266 | 11 709 | 16 070 | 18 556 | 24 558 | 442 810 |
| | White sugar | — | — | — | — | 6798 | 5846 | — | — | 6006 | 6768 | — | — | — | — | — | — | — | — | — | — | — | 25 418 |
| | Total sugar | 38 084 | 14 385 | 16 229 | 18 904 | 19 546 | 14 159 | 23 000 | 23 573 | 56 850 | 33 895 | 21 217 | 22 460 | 26 081 | 16 697 | 17 243 | 23 746 | 11 266 | 11 709 | 16 070 | 18 556 | 24 558 | 468 228 |
| | Total sugar at 96° Pol | 38 442 | 14 463 | 16 665 | 19 471 | 20 183 | 14 603 | 23 663 | 24 191 | 56 500 | 34 932 | 21 887 | 23 116 | 26 716 | 17 192 | 17 734 | 24 380 | 11 593 | 12 001 | 16 507 | 19 070 | 25 239 | 478 548 |

## Table XV. Summary of chemical control data 1975

(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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CANE/SUGAR RATIO | Tonnes cane per tonne sugar made | 8.57 | 9.41 | 9.13 | 9.80 | 9.37 | 10.20 | 9.39 | 9.27 | 9.48 | 9.58 | 9.67 |
| | Tonnes cane per tonne sugar made @ 96° Pol | 8.49 | 9.36 | 8.89 | 9.52 | 9.07 | 9.89 | 9.12 | 9.03 | 9.21 | 9.30 | 9.38 |
| | Sucrose per cent | 13.39 | 12.47 | 12.37 | 11.61 | 12.62 | 12.33 | 12.52 | 12.45 | 12.19 | 12.26 | 12.14 |
| | Fibre per cent | 14.83 | 16.05 | 15.60 | 14.48 | 16.07 | 16.01 | 14.29 | 14.82 | 12.72 | 12.76 | 14.19 |
| BAGASSE | Pol per cent | 2.16 | 1.97 | 1.68 | 1.51 | 2.04 | 2.08 | 1.96 | 1.84 | 1.94 | 1.93 | 1.88 |
| | Moisture per cent | 50.7 | 47.8 | 48.0 | 47.5 | 48.1 | 53.3 | 50.4 | 47.4 | 50.0 | 48.8 | 51.1 |
| | Fibre per cent | 46.3 | 49.5 | 49.7 | 50.5 | 49.2 | 44.0 | 46.9 | 49.9 | 47.3 | 48.5 | 46.2 |
| | Weight per cent cane | 32.00 | 32.41 | 31.36 | 28.69 | 32.60 | 36.40 | 30.43 | 29.70 | 26.91 | 26.30 | 30.70 |
| FIRST EXPRESSED JUICE | Brix (B1)* | 19.30 | 19.14 | 18.77 | 17.00 | 19.34 | 18.64 | 18.45 | 18.14 | 17.63 | 17.79 | 17.90 |
| | Gravity purity | 87.3 | 86.2 | 87.8 | 87.2 | 88.6 | 86.3 | 87.4 | 86.8 | 88.5 | 87.4 | 86.6 |
| | Reducing sugars/sucrose ratio | 3.8 | 3.5 | 3.8 | 4.1 | 2.4 | 4.0 | 4.0 | 5.8 | 3.7 | 4.0 | 4.6 |
| LAST EXPRESSED JUICE | Brix* | 2.53 | 4.11 | 2.92 | 2.93 | 4.18 | 2.66 | 2.25 | 2.18 | 4.03 | 2.54 | 2.51 |
| | Apparent purity | 71.5 | 74.2 | 74.8 | 72.7 | 75.1 | 75.2 | 74.0 | 67.4 | 72.0 | 71.6 | 69.7 |
| MIXED JUICE | Weight per cent on cane | 96.4 | 94.6 | 102.2 | 101.0 | 97.6 | 112.1 | 101.9 | 105.2 | 94.3 | 101.7 | 108.5 |
| | Brix* | 15.30 | 14.91 | 13.52 | 13.06 | 14.26 | 12.20 | 13.62 | 13.34 | 14.25 | 13.53 | 12.59 |
| | Gravity purity | 86.1 | 83.8 | 85.7 | 84.7 | 85.8 | 84.6 | 85.9 | 84.8 | 86.8 | 85.4 | 84.7 |
| | Reducing sugars/sucrose ratio | 4.3 | 4.6 | 5.0 | 5.1 | 3.8 | 4.5 | 4.7 | 6.7 | 4.6 | 4.6 | 5.2 |
| | Gty. Pty. drop from first expressed juice | 1.2 | 2.4 | 2.1 | 2.5 | 2.8 | 1.7 | 1.5 | 2.0 | 1.7 | 2.0 | 1.9 |
| ABSOLUTE JUICE | Brix (Ba) | 18.46 | 17.83 | 17.21 | 16.13 | 17.65 | 17.49 | 17.13 | 17.43 | 16.23 | 16.59 | 16.88 |
| | Ba/B1 | 0.96 | 0.93 | 0.92 | 0.95 | 0.91 | 0.94 | 0.93 | 0.96 | 0.92 | 0.93 | 0.94 |
| | Gravity purity | 85.2 | 83.3 | 85.2 | 84.2 | 85.2 | 83.9 | 85.3 | 83.8 | 86.0 | 84.7 | 83.8 |
| CLARIFIED JUICE | Brix* | 15.14 | 14.02 | 13.22 | 12.45 | 13.32 | 11.69 | 13.78 | 13.16 | 14.35 | 13.13 | 12.81 |
| | Gravity purity | — | 85.2 | 85.9 | 85.1 | 86.7 | 85.9 | — | 84.7 | 87.1 | 85.6 | 86.1 |
| | Reducing sugars/sucrose ratio | 4.5 | 4.4 | 4.7 | 5.2 | 3.5 | 4.5 | — | 6.2 | 4.6 | 4.6 | 4.2 |

| | | 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 | 8.74 | 8.60 | 9.28 | 8.83 | 9.13 | 9.81 | 9.59 | 9.31 | 8.37 | 9.02 | 9.22 |
| | Tonnes cane per tonne sugar made @ 96° Pol | 8.49 | 8.25 | 9.02 | 8.59 | 8.89 | 9.53 | 9.36 | 9.06 | 8.13 | 8.78 | 9.02 |
| | Sucrose per cent | 13.20 | 13.17 | 12.53 | 12.74 | 12.77 | 11.96 | 12.30 | 12.63 | 13.29 | 12.55 | 12.55 |
| | Fibre per cent | 14.32 | 12.92 | 13.68 | 11.87 | 13.25 | 13.86 | 14.81 | 14.40 | 13.27 | 13.26 | 13.97 |
| BAGASSE | Pol per cent | 2.33 | 2.13 | 2.04 | 2.38 | 2.00 | 2.09 | 2.43 | 2.07 | 1.39 | 1.76 | 1.98 |
| | Moisture per cent | 49.6 | 50.5 | 50.0 | 48.5 | 47.5 | 49.6 | 50.8 | 50.9 | 49.6 | 48.7 | 49.5 |
| | Fibre per cent | 47.5 | 46.6 | 47.4 | 48.5 | 49.8 | 47.7 | 46.1 | 46.3 | 48.4 | 48.9 | 47.8 |
| | Weight per cent cane | 30.14 | 27.70 | 28.87 | 24.46 | 26.64 | 29.08 | 32.11 | 31.08 | 27.39 | 27.11 | 29.23 |
| FIRST EXPRESSED JUICE | Brix (B1)* | 18.57 | 18.69 | 17.42 | 17.88 | 18.14 | 16.88 | 18.13 | 18.05 | 18.34 | 17.35 | 18.17 |
| | Gravity purity | 89.4 | 90.1 | 89.8 | 90.8 | 90.0 | 86.7 | 88.0 | 89.1 | 90.5 | 89.6 | 88.3 |
| | Reducing sugars/sucrose ratio | 2.7 | 2.1 | 2.8 | 3.6 | 3.0 | 4.1 | 3.0 | 2.7 | 2.2 | 2.6 | 3.5 |
| LAST EXPRESSED JUICE | Brix* | 2.85 | 2.59 | 2.76 | 2.65 | 2.41 | 2.81 | 2.84 | 3.09 | 1.97 | 2.35 | 2.82 |
| | Apparent purity | 79.6 | 74.6 | 78.1 | 78.1 | 73.9 | 76.1 | 79.1 | 75.0 | 72.7 | 74.5 | 74.3 |
| MIXED JUICE | Weight per cent on cane | 101.9 | 107.5 | 104.5 | 105.6 | 104.9 | 100.5 | 100.0 | 99.9 | 103.3 | 98.4 | 101.3 |
| | Brix* | 13.97 | 13.32 | 12.87 | 12.91 | 13.25 | 13.26 | 13.40 | 13.72 | 14.05 | 13.90 | 13.67 |
| | Gravity purity | 87.8 | 87.8 | 88.8 | 89.2 | 88.0 | 85.2 | 85.9 | 87.5 | 88.9 | 88.2 | 86.5 |
| | Reducing sugars/sucrose ratio | 3.2 | 2.9 | 3.4 | 4.1 | 3.5 | 5.4 | 3.6 | 3.1 | 2.6 | 3.1 | 4.2 |
| | Gty. Pty. drop from first expressed juice | 2.2 | 2.3 | 1.0 | 1.6 | 2.0 | 1.5 | 2.1 | 1.6 | 1.6 | 1.4 | 1.5 |
| ABSOLUTE JUICE | Brix (Ba) | 17.65 | 17.36 | 16.47 | 16.32 | 16.85 | 16.39 | 16.89 | 17.02 | 17.35 | 16.51 | 17.01 |
| | Ba/B1 | 0.94 | 0.93 | 0.95 | 0.91 | 0.93 | 0.97 | 0.93 | 0.94 | 0.95 | 0.95 | 0.94 |
| | Gravity purity | 87.3 | 87.1 | 88.2 | 88.6 | 87.4 | 84.7 | 85.5 | 86.7 | 88.3 | 87.6 | 85.8 |
| CLARIFIED JUICE | Brix* | 12.52 | 12.77 | 12.14 | 12.12 | 13.12 | 13.27 | 12.75 | 13.88 | 12.94 | 13.21 | 13.13 |
| | Gravity purity | 88.3 | 88.6 | — | 89.3 | 88.3 | 85.7 | 86.0 | 87.6 | 88.9 | 88.0 | 86.8 |
| | Reducing sugars/sucrose ratio | 2.9 | 3.0 | 3.0 | 4.2 | — | 4.7 | 3.6 | 3.0 | 2.6 | 3.1 | 4.0 |

* Refractometric Brix

**Table XV. Summary of chemical control data 1975**

(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 | 0.82 | 1.01 | 1.52 | 1.69 | 0.73 | 0.66 | 1.00 | 0.63 | 0.52 | 1.92 | 0.49 | 1.13 | 0.59 | 1.82 | 1.01 | 0 98 | 6.94 | 3.61 | 8.00 | 1.74 | 2.58 | 1.49 |
| | Weight per cent cane | 4.57 | 3.32 | 4.91 | 3.47 | 3.00 | 2.25 | 3 49 | 3 45 | 3.34 | 4.06 | 4.45 | 3.49 | 2 46 | 3.72 | 4.32 | 1.63 | 1.88 | 3.91 | 2.56 | 3.60 | 5.31 | 3.55 |
| SYRUP | Brix* | 60.4 | 58.0 | 58.0 | 59.6 | 61.5 | 60.6 | 60.2 | 63.6 | 60.3 | 57.8 | 61.5 | 58.9 | 60.2 | 68.6 | 61.2 | 53.7 | 54.8 | 50.0 | 62.1 | 59.6 | 60.4 | 59.6 |
| | Gravity purity | — | 85.2 | 85.6 | 85.5 | 86.9 | 85.1 | — | 84.9 | 86.9 | 85.5 | 85.7 | 88.6 | 88.9 | — | 89.9 | 87.9 | 85.8 | 85.9 | 87.5 | 89.2 | 88.2 | 86.8 |
| | Reducing sugars/sucrose ratio | 4.6 | 3.7 | 4.7 | 5.3 | 3.6 | 4.8 | — | 6.5 | 4.4 | 4.7 | 4.0 | 3.1 | 2.7 | 3.2 | 4.1 | — | 4.3 | 3.6 | 3.3 | 2.6 | 3.2 | 4.0 |
| pH VALUES | Limed juice | 8.1 | 8.1 | 8.6 | 7 7 | 8.3 | — | — | 7.9 | 8.2 | 8.2 | 7.9 | — | 7.8 | 8.1 | 8.0 | — | — | 7.8 | 8.5 | 8.2 | 8.4 | 8.1 |
| | Clarified juice | 7.1 | 7.2 | 7.2 | 6.8 | 7.4 | 7.1 | 7.0 | 7.5 | 7.3 | 7.3 | 7.3 | 7.4 | 7.1 | 7.2 | 7 1 | 7.1 | 7.0 | 7.0 | 7.4 | 7.2 | 7.3 | 7.2 |
| | Filter press juice | — | — | 9.4 | — | 6.9 | — | 7.1 | 7.1 | 8.8 | 7.1 | 8.0 | 7.2 | 7 7 | 7.1 | — | 6.4 | — | — | 6.4 | 6.8 | 8.8 | 7.5 |
| | Syrup | 6.3 | — | 7.2 | 6.4 | 6.6 | 6.3 | 6.6 | 6.7 | 7.0 | 6.8 | 6.9 | 6.9 | 6.7 | 6.7 | 7 1 | 6.4 | — | 6.6 | 7.1 | 6.7 | 7.1 | 6.7 |
| FINAL MOLASSES | Brix** | 85.0 | 82.8 | 84.7 | 84.0 | 83.7 | 82.3 | 86.1 | 79.8 | 84.0 | 83.5 | 80.8 | 84.6 | 85.9 | 85.9 | 84.2 | 87.1 | 85.7 | 81.1 | 90.9 | 84.3 | 83.5 | 84.5 |
| | Sucrose per cent | 31.47 | 30.45 | 28.15 | 28.37 | 29.91 | 33.40 | 30.87 | 29.17 | 30.30 | 32.20 | 29.44 | 31.85 | 31.26 | 31.79 | 31.19 | 32.30 | 32.40 | 30.61 | 35.91 | 31.06 | 31.06 | 31.09 |
| | Reducing sugars per cent | 16.60 | 13.08 | 15.23 | 16.67 | 12.66 | 13.21 | 18.91 | 17.84 | 16.40 | 15.70 | 12 11 | 13.47 | 13.71 | 14.11 | 16.72 | 14.24 | 16.00 | 12.28 | 11.16 | 11.70 | 12.87 | 14.96 |
| | Total sugars per cent | 56.54 | 43.53 | 43.38 | 45.04 | 42.57 | 46.61 | 49.78 | 47.01 | 46.70 | 47.90 | 41.55 | 45.32 | 44.97 | 45.90 | 47.91 | 46.49 | 48.40 | 42.89 | 44.31 | 42.76 | 43.92 | 46.05 |
| | Gravity purity | 37.0 | 36.8 | 33.2 | 33.8 | 35.7 | 40.6 | 35.8 | 36.6 | 36 1 | 38.6 | 36.4 | 37.7 | 36.4 | 37.0 | 37.0 | 37.0 | 37.8 | 37.7 | 39.5 | 36.8 | 37.2 | 36.8 |
| | Reducing sugars/sucrose ratio | 52.6 | 43.7 | 54.1 | 58.8 | 42.3 | 39.6 | 61.3 | 61.2 | 54.1 | 48.8 | 41.1 | 42.3 | 43.9 | 44.4 | 53.6 | 44.2 | 49.3 | 40.1 | 33.7 | 37.7 | 41.4 | 48.1 |
| | Weight per cent cane @ 85° Brix | 3.07 | 3.18 | 3.18 | 3.22 | 3.36 | 3.96 | 3.62 | 3 44 | 2.89 | 3.35 | 2.92 | 2.77 | 2.68 | 2.35 | 2.29 | 2.35 | 2.96 | 2.96 | 2.68 | 2 49 | 2.42 | 2.98 |
| SUGAR MADE | White sugar recovered per cent cane | — | — | — | — | 3.71 | 4.05 | — | — | 1.11 | 2.08 | — | — | — | — | — | — | — | — | — | — | — | 0.59 |
| | Raw sugar recovered per cent cane | 11.67 | 10.62 | 10.96 | 10.20 | 6.96 | 5.76 | 10.65 | 10.79 | 9.44 | 8.35 | 10.34 | 11.44 | 11.83 | 10.77 | 11.32 | 10.95 | 10.19 | 10.43 | 10.74 | 11.97 | 11.09 | 10.26 |
| | Total sugar recovered per cent cane | 11.67 | 10.62 | 10.96 | 10.20 | 10.67 | 9.81 | 10.65 | 10.79 | 10.55 | 10.43 | 10.34 | 11.44 | 11.83 | 10.77 | 11.32 | 10.95 | 10.19 | 10 43 | 10.74 | 11.97 | 11.09 | 10.85 |
| | Average pol of sugars | 98.51 | 98.24 | 98.58 | 98.88 | 99.13 | 99.02 | 98.77 | 98.52 | 98.79 | 98.94 | 99.04 | 98.80 | 98.34 | 98.85 | 98.73 | 98.56 | 98.78 | 98.40 | 98.61 | 98.77 | 98.66 | 98.71 |
| | Total sucrose recovered % cane | 11.50 | 10.44 | 10.80 | 10.08 | 10.58 | 9.71 | 10.52 | 10.63 | 10.42 | 10.32 | 10.24 | 11.30 | 11.41 | 10.64 | 11.18 | 10.80 | 10.07 | 10.26 | 10.59 | 11.82 | 10.94 | 10.71 |
| | Moisture per cent raw sugar | 0.37 | 0.38 | 0.39 | 0.29 | 0.36 | 0.34 | 0.28 | 0.43 | 0.32 | 0.34 | 0.30 | 0.28 | 0.51 | 0.36 | 0.32 | 0.39 | 0.40 | 0.33 | 0.37 | 0.24 | 0.32 | 0.35 |
| | Dilution indicator of raw sugar | 32.9 | 27.3 | 37.1 | 35.1 | 41.3 | 30.3 | 29.5 | 40.2 | 31.2 | 36.6 | 45.3 | 30.7 | 43.6 | 45.2 | 33.8 | 37.0 | 48.1 | 25.8 | 33.7 | 24.5 | 31.8 | 34.7 |

* Refractometric Brix 1 : 5 w/w

** Refractometric Brix 1 : 6 w/w

## Table XV. Summary of chemical control data 1975

(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 | 84.3 | 82.2 | 89.1 | — | 86.2 | 80.7 | 82.1 | 81.2 | 84.5 | 84.9 | 82.5 | 86.2 | 87.9 | 85.0 | 83.8 | 85.4 | 85.8 | 86.3 | 85.8 | 86.2 | 84.5 | 84.7 |
| A-MASSECUITE | Brix** | 92.2 | 91.7 | 90.5 | 92.5 | 91.4 | 90.6 | 92.6 | 93.3 | 93.2 | 91.7 | 92.8 | 91.5 | 91.5 | 93.3 | 92.9 | 92.5 | 90.7 | 91.0 | 91.7 | 92.4 | 91.6 | 92.1 |
| | Apparent purity | 85.1 | 81.5 | 85.2 | 83.9 | 87.5 | 84.0 | 80.6 | 79.8 | 82.5 | 83.4 | 83.7 | 87.1 | 81.0 | 84.4 | 82.6 | 79.6 | 81.6 | 83.9 | 82.8 | 83.0 | 83.0 | 83.0 |
| | Apparent purity of A molasses | 67.2 | 57.6 | 66.9 | 58.8 | 71.9 | 70.5 | 55.6 | 56.1 | 61.9 | 61.8 | 60.5 | 65.7 | 60.8 | 57.3 | 65.4 | 54.9 | 58.4 | 64.9 | 64.0 | 60.0 | 65.5 | 61.7 |
| | Drop in purity | 17.9 | 23.9 | 18.3 | 25.1 | 15.6 | 13.5 | 25.0 | 23.7 | 20.6 | 21.6 | 23.2 | 21.4 | 20.2 | 27.1 | 26.2 | 24.7 | 23.2 | 19.0 | 18.8 | 23.0 | 17.5 | 21.3 |
| | Crystal per cent Brix in massecuite | 54.6 | 56.4 | 55.3 | 60.9 | 55.5 | 45.8 | 56.4 | 54.0 | 54.1 | 56.5 | 58.7 | 62.4 | 51.5 | 63.5 | 60.1 | 54.8 | 55.8 | 54.1 | 52.2 | 57.5 | 50.7 | 55.6 |
| | Litres per tonne Brix in mixed juice | 704 | 981 | 752 | 960 | 796 | 894 | — | 892 | 888 | 937 | 738 | 646 | 1237 | 955 | 1136 | 1210 | 1023 | 858 | 753 | 1145 | 925 | 912 |
| | A-massecuite per cent total massecuite | 57.5 | 75.5 | 55.2 | 75.8 | 52.5 | 53.5 | — | 74.9 | 66.0 | 61 4 | 62.0 | 49.1 | 76.9 | 81.7 | 83.4 | 85.6 | 77.7 | 60.4 | 62.1 | 83.7 | 65.4 | 67.1 |
| B-MASSECUITE | Brix** | 91.8 | — | 90.4 | — | 92.7 | 92.1 | — | — | 93.0 | 91.7 | 93.5 | 92.6 | 91.8 | — | — | — | — | 92.3 | 91.5 | — | 92.4 | 92.2 |
| | Apparent purity | 73.4 | — | 75.0 | — | 77.9 | 75.7 | — | — | 75.8 | 74.8 | 76.1 | 77.6 | 75.3 | — | — | — | — | 75.1 | 74.5 | — | 73.8 | 74.4 |
| | Apparent purity of B molasses | 53.5 | — | 50.3 | — | 57.2 | 55.7 | — | — | 56.2 | 55.9 | 56.1 | 52.3 | 57.1 | — | — | — | — | 53.0 | 53.2 | — | 56.1 | 54.8 |
| | Drop in purity | 19.9 | — | 24.7 | — | 20.7 | 20.0 | — | — | 19.6 | 18.9 | 20.0 | 25.3 | 18.2 | — | — | — | — | 22.1 | 21.3 | — | 17.7 | 19.6 |
| | Crystal per cent Brix in massecuite | 42.8 | — | 49.7 | — | 48.4 | 45.1 | — | — | 44.7 | 42.9 | 45.6 | 53.0 | 42.4 | — | — | — | — | 47.0 | 45.5 | — | 40.3 | 43.4 |
| | Litres per tonne Brix in mixed juice | 325 | — | 359 | — | 446 | 453 | — | — | 206 | 306 | 209 | 403 | 120 | — | — | — | — | 261 | 252 | — | 271 | 194 |
| | B massecuite per cent total massecuite | 26.5 | — | 26.4 | — | 29.4 | 27.1 | — | — | 15.3 | 20.0 | 17.6 | 30.7 | 7.4 | — | — | — | — | 18.5 | 20.8 | — | 19.2 | 14.3 |
| | Kg sugar per cubic metre of A & B massecuite | 768 | 767 | 713 | 805 | 618 | 532 | — | 862 | 718 | 611 | 800 | 760 | 609 | 838 | 730 | 651 | 748 | 697 | 779 | 720 | 677 | 746 |
| C-MASSECUITE | Brix** | 94.6 | 95.1 | 93.6 | 95.1 | 96.4 | 94.8 | 95.9 | 95.6 | 93.8 | 94.8 | 96.3 | 95.2 | 96.7 | 93.4 | 94.5 | 93.7 | 92.9 | 94.1 | 93.5 | 95.0 | 97.3 | 94.9 |
| | Apparent purity | 55.3 | 58.1 | 57.4 | 59.0 | 60.6 | 58.8 | 59.1 | 57.9 | 59.2 | 58.5 | 58.9 | 59.7 | 60.2 | 58.9 | 62.4 | 59.0 | 60.6 | 59.2 | 58.3 | 61.0 | 59.5 | 59.0 |
| | Apparent purity of final molasses | 33.6 | 34.3 | 29.2 | 31.1 | 37.7 | 38.5 | 35.2 | 32.7 | 32.9 | 35.9 | 34.4 | 33.8 | 33.6 | 34.1 | 34.3 | 32.3 | 34.7 | 35.2 | 37.2 | 35.5 | 35.1 | 34.2 |
| | Drop in purity | 21.7 | 23.8 | 28.2 | 27.9 | 22.9 | 20.3 | 24.0 | 25.2 | 26.3 | 22.6 | 24.5 | 25.9 | 26.6 | 24.8 | 28.1 | 26.7 | 25.9 | 24.0 | 21.1 | 25.5 | 24.4 | 24.8 |
| | Crystal per cent Brix in massecuite | 32.7 | 36.2 | 39.8 | 40.5 | 36.8 | 33.0 | 37.0 | 37.4 | 39.2 | 35.3 | 37.3 | 39.1 | 40.1 | 37.6 | 42.8 | 39.5 | 39.7 | 37.0 | 33.6 | 39.5 | 37.6 | 37.7 |
| | Litres per tonne Brix in mixed juice | 196 | 318 | 251 | 306 | 276 | 324 | — | 294 | 251 | 284 | 243 | 265 | 253 | 214 | 227 | 205 | 294 | 298 | 208 | 223 | 218 | 253 |
| | C-massecuite per cent total massecuite | 16.0 | 24.5 | 18.4 | 24.2 | 18.1 | 19.4 | — | 25.1 | 18.7 | 18.6 | 20.4 | 20.2 | 15.7 | 18.3 | 16.6 | 14.5 | 22.3 | 21.1 | 17.1 | 16.3 | 15.4 | 18.6 |
| TOTAL MASSECUITE | Litres per tonne Brix in mixed juice | 1225 | 1300 | 1362 | 1266 | 1518 | 1671 | — | 1186 | 1345 | 1527 | 1189 | 1314 | 1610 | 1169 | 1363 | 1414 | 1317 | 1417 | 1213 | 1368 | 1414 | 1360 |
| | Litres per tonne sugar made | 1549 | 1726 | 1735 | 1638 | 1980 | 2330 | — | 1542 | 1713 | 2010 | 1571 | 1636 | 1949 | 1460 | 1642 | 1794 | 1722 | 1817 | 1550 | 1661 | 1745 | 1648 |

** Refractometric Brix 1:6 w/w

**Table XV. Summary of chemical control data 1975**

(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 | Riche 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 | 28.5 | 27.1 | 33.6 | 23.5 | 30.3 | 48.5 | 32.4 | 34.9 | 21.2 | 28.0 | 39.2 | 32.1 | 35.2 | 33.4 | 30.1 | 31.6 | 29.5 | 32.1 | 31.0 | 30.7 | 25.6 | 30.5 |
| | Imbibition water % fibre | 192 | 169 | 215 | 205 | 188 | 303 | 226 | 235 | 167 | 220 | 267 | 224 | 273 | 244 | 254 | 240 | 213 | 217 | 215 | 232 | 193 | 218 |
| | Extraction ratio | 34.8 | 31.9 | 27.2 | 25.8 | 32.9 | 38.3 | 33.4 | 29.6 | 33.8 | 32.5 | 33.7 | 37.1 | 34.8 | 34.4 | 38.5 | 31.5 | 36.8 | 42.9 | 35.4 | 21.5 | 28.7 | 32.9 |
| | Mill extraction | 94.8 | 94.9 | 95.8 | 96.3 | 94.7 | 93.9 | 95.2 | 95.6 | 95.7 | 95.9 | 95.2 | 94.7 | 95.5 | 95.3 | 95.4 | 95.8 | 94.9 | 93.7 | 94.9 | 97.1 | 96.2 | 95.4 |
| | Reduced mill extraction | 95.8 | 96.2 | 96.7 | 96.9 | 96.1 | 95.4 | 95.9 | 96.4 | 95.8 | 96.0 | 95.9 | 95.5 | 95.7 | 95.8 | 95.2 | 96.1 | 95.5 | 94.8 | 95.7 | 97.3 | 96.4 | 96.0 |
| SUCROSE LOSSES | Sucrose lost in bagasse % cane | 0.69 | 0.64 | 0.53 | 0.43 | 0.67 | 0.76 | 0.60 | 0.55 | 0.52 | 0.51 | 0.58 | 0.70 | 0.59 | 0.59 | 0.58 | 0.53 | 0.61 | 0.78 | 0.64 | 0.38 | 0.48 | 0.58 |
| | ,, ,, in filter cake % cane | 0.04 | 0.03 | 0.07 | 0.06 | 0.02 | 0.01 | 0.04 | 0.02 | 0.02 | 0.08 | 0.02 | 0.04 | 0.01 | 0.07 | 0.04 | 0.02 | 0.13 | 0.14 | 0.20 | 0.06 | 0.14 | 0.05 |
| | ,, ,, in molasses % cane | 0.97 | 1.04 | 0.90 | 0.92 | 1.02 | 1.36 | 1.10 | 1.07 | 0.88 | 1.10 | 0.90 | 0.89 | 0.83 | 0.71 | 0.71 | 0.74 | 0.95 | 0.95 | 0.90 | 0.78 | 0.76 | 0.93 |
| | Undertermined losses % cane | 0.19 | 0.32 | 0.07 | 0.12 | 0.33 | 0.49 | 0.30 | 0.18 | 0.35 | 0.25 | 0.40 | 0.27 | 0.10 | 0.51 | 0.24 | 0.67 | 0.20 | 0.17 | 0.30 | 0.25 | 0.23 | 0.28 |
| | Industrial losses % cane | 1.20 | 1.39 | 1.04 | 1.10 | 1.37 | 1.86 | 1.44 | 1.27 | 1.25 | 1.43 | 1.32 | 1.20 | 0.94 | 1.29 | 0.99 | 1.43 | 1.28 | 1.26 | 1.40 | 1.09 | 1.13 | 1.27 |
| | Total losses % cane | 1.89 | 2.03 | 1.57 | 1.53 | 2.04 | 2.62 | 2.03 | 1.82 | 1.77 | 1.94 | 1.90 | 1.90 | 1.53 | 1.88 | 1.57 | 1.96 | 1.89 | 2.04 | 2.04 | 1.47 | 1.61 | 1.85 |
| SUCROSE BALANCE | Sucrose in bagasse % sucrose in cane | 5.16 | 5.12 | 4.25 | 3.70 | 5.29 | 6.13 | 4.77 | 4.39 | 4.29 | 4.15 | 4.78 | 5.31 | 4.47 | 4.70 | 4.57 | 4.17 | 5.10 | 6.35 | 5.09 | 2.86 | 3.81 | 4.60 |
| | ,, ,, filter cake % sucrose in cane | 0.30 | 0.27 | 0.60 | 0.52 | 0.18 | 0.12 | 0.28 | 0.17 | 0.14 | 0.64 | 0.17 | 0.30 | 0.11 | 0.54 | 0.34 | 0.13 | 1.09 | 1.15 | 1.62 | 0.47 | 1.09 | 0.42 |
| | ,, ,, molasses % sucrose in cane | 7.21 | 7.99 | 7.27 | 7.92 | 8.07 | 11.07 | 8.81 | 8.61 | 7.23 | 8.95 | 7.41 | 6.72 | 6.30 | 5.66 | 5.59 | 5.78 | 7.94 | 7.71 | 7.11 | 5.87 | 6.09 | 7.44 |
| | Undetermined losses % sucrose in cane | 1.42 | 2.57 | 0.56 | 1.03 | 2.62 | 3.91 | 2.39 | 1.45 | 2.87 | 2.05 | 3.29 | 2.05 | 0.74 | 4.15 | 1.88 | 5.38 | 1.67 | 1.36 | 2.38 | 1.87 | 1.85 | 2.23 |
| | Industrial losses % sucrose in cane | 8.96 | 10.83 | 8.43 | 9.47 | 10.87 | 15.10 | 11.48 | 10.23 | 10.24 | 11.64 | 10.87 | 9.07 | 7.15 | 10.35 | 7.77 | 11.29 | 10.70 | 10.22 | 11.11 | 8.21 | 9.03 | 10.09 |
| | Total losses % sucrose in cane | 14.12 | 15.95 | 12.68 | 13.17 | 17.16 | 21.23 | 16.24 | 14.62 | 14.53 | 15.79 | 15.65 | 14.38 | 11.62 | 15.05 | 12.32 | 15.46 | 15.80 | 16.57 | 16.20 | 11.07 | 12.84 | 14.69 |
| RECOVERIES | Boiling house recovery | 90.5 | 88.2 | 91.2 | 90.2 | 88.5 | 83.9 | 88.2 | 89.3 | 89.3 | 87.9 | 88.6 | 90.4 | 92.5 | 89.1 | 91.9 | 88.2 | 88.7 | 89.1 | 88.3 | 91.6 | 90.6 | 89.4 |
| | Reduced boiling house recovery (Pty. M.J.85°) | 89.7 | 89.2 | 90.7 | 90.4 | 87.8 | 84.4 | 87.3 | 89.5 | 87.6 | 87.5 | 88.8 | 87.9 | 90.5 | 84.8 | 88.1 | 84.5 | 88.5 | 88.3 | 85.3 | 88.1 | 87.4 | 88.0 |
| | Overall recovery | 85.9 | 85.4 | 87.3 | 86.8 | 83.8 | 78.8 | 84.0 | 85.4 | 85.5 | 84.2 | 84.4 | 85.6 | 88.4 | 84.9 | 87.7 | 84.5 | 84.2 | 83.4 | 83.8 | 88.9 | 87.2 | 85.3 |
| | Reduced overall recovery (Pty. M.J. 85° F% C 12.5) | 85.9 | 85.8 | 87.7 | 87.6 | 84.3 | 80.5 | 83.7 | 86.2 | 83.9 | 80.8 | 85.2 | 83.9 | 86.6 | 81.2 | 83.9 | 81.2 | 84.5 | 83.7 | 81.7 | 85.7 | 84.3 | 84.4 |
| | Boiling house efficiency | 99.4 | 98.8 | 98.9 | 98.9 | 97.2 | 95.3 | 96.6 | 98.7 | 97.1 | 97.9 | 98.4 | 98.2 | 99.8 | 95.8 | 98.3 | 95.7 | 98.8 | 98.1 | 96.7 | 98.2 | 97.8 | 97.8 |

# APPENDIX I

## THE MAURITIUS HERBARIUM

### Flora of the Mascarene islands

The fascicle of Goodeniaceae and Campanulaceae, which is the first part of the *Flora*, was in press at the end of the year.

Families prepared in manuscript for the *Flora* were named in last year's report. To them can now be added : Agavaceae, Aizoaceae, Amaryllidaceae, Balsaminaceae, Basellaceae, Bixaceae, Burseraceae, Casuarinaceae, Chenopodiaceae, Combretaceae, Flagellariaceae, Guttiferae, Iridaceae, Liliaceae, Melastomataceae, Myrsinaceae, Nyctaginaceae, Nymphaeceae, Pittosporaceae Polygonaceae, Pontederiaceae, Surianaceae, Tamaricaceae, Thelypteridaceae, Violaceae and Xyridaceae.

Families still in preparation are: Annonaceae, Araliaceae, Callitrichaceae, Connaraceae, Cucurbitaceae, Euphorbiaceae, Lauraceae, Primulaceae, Rosaceae, Sapotaceae and Sapindaceae.

Mr. M.J.E. Coode resigned as taxonomist for the *Flora* project and joined the Kew staff in December. He has been replaced by Dr. I. Richardson.

### Accessions

During the year, 985 specimens were acquired, as follows :

| | | | |
|---|---|---|---|
| from Aldabra | ... | ... | 12 |
| ,, Mauritius | ... | ... | 770 |
| ,, Réunion | ... | ... | 114 |
| ,, Rodriguez | ... | ... | 77 |
| ,, Seychelles | ... | ... | 12 |

Duplicate specimens were exchanged or shared with the Royal Botanic Gardens, Kew, the *Muséum National d'Histoire Naturelle*, Paris and the *Centre d'Enseignement Supérieur Scientifique*, Saint Denis, La Réunion and this led to the acquisition of material hitherto not represented in the Herbarium. Among other valuable items acquired were voucher specimens of several intraspecific variants, which will be eventually recognised in the revisions of various families for the *Flora*.

### Field work

Observations were made on the distribution of *Tetrataxis salicifolia* and *Drypetes* sp., both trees of very localised occurrence on the island.

### Visitors

Mr. F. Friedmann of the *Office de la Recherche Scientifique et Technique Outre Mer* visited Mauritius to study in the field species belonging to the families Sapotaceae and Sapindaceae. He surveyed several forested sites and collected material for the Paris Museum.

Mr. M.J.E. Coode of Kew visited the island in February and pursued his studies of the vegetation of Mauritius, with particular reference to the *Euphorbiaceae*.

In September, Dr. D.F. Blaxell, Australian Liaison Officer at the Royal Botanic Gardens, Kew, visited the Nature Reserves and studied orchids in the field.

Dr. D.C. Ducker of the University of Melbourne studied marine algae at several sites in Mauritius.

**Distribution and loan of specimens**

Herbarium collections of fourteen families of flowering plants were sent to the Royal Botanic Gardens, Kew and the *Muséum National d'Histoire Naturelle*, Paris, for study.

Samples of wood and leaf of *Psiloxylon mauritianum* were despatched to Prof. R. Schmid, University of California, U.S.A. for anatomical study.

A small collection of living orchids collected by Dr. D.F. Blaxell in Mauritius was sent to the Royal Botanic Gardens, Sydney, New South Wales.

**Accessions to the herbarium library**

Taxonomic papers on the Mascarene flora are given below:

Jonsell, B. (1974). The genus *Rorippa* (Cruciferae) in Tropical Africa and Madagascar. *Svensk bot. Tidsikr.* **68** : 377-396.

Marais, W. (1974). The extra-Madagascan species of *Lomatophyllum* (Liliaceae). *Kew Bull.* **29** (4) : 721-723.

Coode, M.J.E. (1974). Notes on *Euodia* (Rutaceae) in the Mascarene islands. *Kew Bull.* **30** (2) : 215-221.

# APPENDIX II

## SEPARATE PUBLICATIONS BY INSTITUTE PERSONNEL, 1953-75

The work of the Institute since its inception in 1953 is easily traceable in its Annual Reports but articles by the personnel of the Institute have also appeared separately, either in publications issued by the Institute or in scientific journals, etc. In the earlier years, the Annual Reports often gave detailed accounts of work done but more recently the policy has been to outline current work in Annual Reports and to publish details in definitive articles published separately or in standard journals. This policy is aimed at avoiding piecemeal publication and presenting cohesive accounts when the progress of an investigation warrants. Since 1971, separate publications and journal publications appearing each year have been listed and abstracted in the Annual Reports but there was no listing prior to that date.

The list that follows gives all separate publications of the Institute and all articles published by its personnel in scientific journals since the founding of the Institute. Technical Circulars, although mimeographed, are included as they have been widely distributed and contain much of interest.

Articles published in Annual Reports from 1954 to 1963 were indexed in an appendix to the 1964 report but the Reports themselves have to be consulted for articles that appeared during the period 1964 to 1970, after which the Report adopted its present form.

**General**

Antoine, R. (1963). Quelques aspects de l'industrie sucrière sud-africaine. *Revue agric. sucr. Ile Maurice* **42** : 19-35.

Antoine, R. (1975). La méchanisation de la culture de la canne au Queensland. *Revue agric. sucr. Ile Maurice* **54** : 190-204.

Arlidge, E.Z. (comp.) (1975). *Rodriguez Island — Land Suitability Map, 1 : 20 000.* Food & Agriculture Organization of the United Nations and Mauritius Sugar Industry Research Institute.

Arlidge, E.Z. & Wong You Cheong, Y. (1975). Notes on the land resources and agricultural suitability map of Mauritius 1 : 50 000. Food and Agriculture Organization of the United Nations and Mauritius Sugar Industry Research Institute. *Occ. Paper Maurit. Sug. Ind. Res. Inst.* **29** : 137 pp.

Halais, P. & Davy, E.G. (1969). Notes on the 1 : 1 000 000 agroclimatic map of Mauritius *Occ. Paper Maurit. Sug. Ind. Res. Inst.* **23** : 27 pp.

Ly-Tio-Fane, M. (1974). *Le sejour de Commerson à l'Isle Bourbon, 1770-1771.* Actes du Colloque Commerson, Octobre 1973. Cahiers du Centre Universitaire de la Réunion, No. spécial : pp. 111-116.

Mazery, G. (1955). Report on a visit to the Natal Sugar Belt in 1954. *Revue agric. sucr. Ile Maurice* **34** : 56-65.

Mazery, G. (1960). Transport et chargement de cannes. *Revue agric. sucr. Ile Maurice* **39** : 191-197.

Mazery, G. (1969). Chargement et transport de la canne à sucre. *Revue agric. sucr. Ile Maurice* **48** : 307-310.

Parish, D.H. & Feillafé, S.M. (1965). Notes on the 1 : 1 000 000 soil map of Mauritius. *Occ. Paper Maurit. Sug. Ind. Res. Inst.* **22**, 43 pp.

Ricaud, C. (1975). Pesticide use and hazards in Mauritian agriculture. *Revue agric. sucr. Ile Maurice* **54 :** 143-148.

Rochecouste, E., Vaughan, R.E., Autrey, J.C. & McIntyre, G. (1959-1975). *Weeds of Mauritius.* Illus. by L.S. de Réland and J. Guého. Leaflets 1-16. Mauritius Sugar Industry Research Institute.

Saint Antoine, J.D. de R. de (1960). Cane payment in Mauritius. *Proc. int. Soc. Sug. Cane Technol* **10 :** 163-167.

Sentenac, R. (1962). Recherches d'eau souterraine à l'Ile Maurice. I. Généralités. *Occ. Paper Maurit. Sug. Ind. Res. Inst.* **12**, 27 pp.

Sentenac, R. (1963). Recherches d'eau souterraine à l'Ile Maurice. II. Secteurs de Pamplemousses, Rivière du Rempart, Plaine des Roches, Nouvelle Découverte. *Occ. Paper Maurit. Sug. Ind. Res. Inst.* **15** , 28 pp.

Sentenac, R. (1963). Recherches d'eau souterraine à l'Ile Maurice. III. Secteurs de Flacq, Grand Port, *Occ. Paper Maurit. Sug. Ind. Res. Inst.* **16 :** 29 pp.

Sentenac, R. (1963). Recherches d'eau souterraine à l'Ile Maurice. IV. Secteurs de Plaines Wilhems, Rivière Noire, Chamarel, Conclusion générale. *Occ. Paper. Mauritius Sug. Ind. Res. Inst.* **17**. 24 pp.

Wong You Cheong, Y. (1975). The land resources of Mauritius. *Commerce* (*Bombay*) **131 :** (3371) : 38-40.

**Sugar cane varieties/sugar cane breeding**

Anon (1966). Notes on noble cane varieties in the breeding plot at Médine S.E. (Palmyre). *Tech. Circ. Maurit. Sug. Ind. Res. Inst.* **27**, 7 pp. (mimeo).

George, E.F. (1960). Factors affecting the initiation of flowering in sugar cane. *Revue agric. sucr. Ile Maurice* **39 :** 238-240.

George, E.F. (1960). Effects of the environment on components of yield in seedlings from five *Saccharum* crosses. *Proc. int. Soc. Sug. Cane Technol.* **10 :** 755-765.

George, E.F. (1962). An experiment to compare the selection of sugar cane varieties from seedlings bunch planted in two different ways and from others singly planted. *Occ. Paper Maurit. Sug. Ind. Res. Inst.* **9 :** 35 p.

George, E.F. (1963). A further study of *Saccharum* progenies in contrasting environments. *Proc. int. Soc. Sug. Cane Technol.* **11 :** 488-497.

George, E.F. (1963). Application of a grade score in determining the potential of sugar cane crosses. *Proc. int. Soc. Sug. Cane Technol.* **11 :** 498-503.

George, E.F. (1965). Physiological growth attributes of *Saccharum* clones and their progenies. *Ann. Bot.* **29 :** 153-165.

George, E.F. (1967). An experiment to assess the effect of competition between sugar cane clones at the microplot stage of selection. *Proc. int. Soc. Sug. Cane Technol.* **12 :** 920-930.

George, E.F. & Groot, W. de (1963). Inherent defects of seedlings in Mauritius. *Proc. int. Soc. Sug. Cane Technol.* **11 :** 414-421.

George, E.F. & Lalouette, J.A. (1963). Photoperiodic experiments on the sugar cane variety C.P. 36-13. *Proc. int. Soc. Sug. Cane Technol.* **11 :** 516-526.

Groot, W. de & George, E.F. (1963). Breeding of sugar cane varieties in Mauritius. *Proc. int. Soc. Sug. Cane Technol.* **11 :** 436-446.

Julien, H.R. (1969). The role of leaves in the perception and inhibition of the flowering stimulus in sugar cane. *Proc. int. Soc. Sug. Cane Technol.* **13 :** 976-983.

Julien, H.R. (1972). The photoperiodic control of flowering in *Saccharum. Proc. int. Soc. Sug. Cane Technol.* **14** : 323-333.

Julien, H.R. (1973). Physiology of flowering in *Saccharum.* I. Day length control of floral initiation and development in *S. spontaneum* L. *J. exp. Bot.* **24** : 449-557.

Julien, H.R. & Soopramanien, G.C. (1975). Effects of night breaks on floral initiation and development in *Saccharum. Crop Sci.* **15** : 625-629.

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

Lalouette, J.A. (1967). Growth of pollen tube in *Saccharum* and *Erianthus* sp. exhibited by Callose Fluorochrome reaction. *Grana palynol.* **7** : 602-603.

Lalouette, J.A. (1968). Breeding of sugar cane varieties in Mauritius. *Proc. int. Soc. Sug. Cane Technol.* **13** : 1062-1067.

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Rochecouste, E. (1961). Botanical and agricultural characters of sugar cane varicties of Mauritius. 1. Ebène 1/37 and M 147/44. *Occ. Paper Maurit. Sug. Ind. Res. Inst.* **5**, 7 pp.

Rochecouste, E. (1964). Botanical and agricultural characters of sugar cane varieties of Mauritius. 2. M 202/46, M 93/48, M 253/48 and Ebène 50/47. *Occ. Paper Maurit. Sug. Ind. Res. Inst.* **18**, 18 pp.

Sornay, A. de (1954). Les variétés de cannes B 3337, B 34104, B 37161 and B 37172. *Revue agric. sucr. Ile Maurice* **33** : 111-115.

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Anon. (1957). Diagnostic foliaire. *Tech. Circ. Maurit. Sug. Ind. Res. Inst.* **6**, 3 pp . (mimeo).

Chan, P.Y. & Li Pi Shan, L. (1975). Some soil moisture data and their application to irrigation of sugar cane. *Revue agric. sucr. Ile Maurice* **54** : 115-119.

Halais, P. (1955). Diagnostic foliaire des secteurs Ouest, Centre et Est. *Tech. Circ. Maurit. Sug. Ind. Res. Inst.* **2**, 4 pp . (mimeo).

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Julien, H.R. (1974). An evaluation of methods used for maturity testing. *Proc. int. Soc. Sug. Cane Technol.* **15** : 991-1000.

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Antoine, R. (1957). A histo-chemical test for diagnosing Ratoon Stunting Disease of sugar cane. *Proc. Pan Indian Ocean Scientific Congress* **3** : 155-160.

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