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PROCEEDINGS
OF THE
CARIBBEAN FOOD CROPS SOCIETY



FIFTH ANNUAL MEETING
PARAMARIBO, SURINAM
JULY 24 – 31, 1967

VOLUME V

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CHAIRMEN

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Session 2 — Tuesday	July 25	0800 — 1230	Dr. J. Swanson
Session 3 — Tuesday	July 25	1430 — 1730	J. Gabriel
Session 4 — Wednesday	July 26	0800 — 1145	Dr. G. Samuels
Session 5 — Friday	July 28	0800 — 1230	W. de Courcey Jeffers

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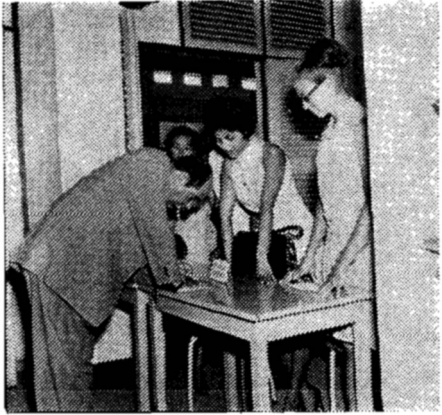
President : **F. A. del Prado** **Surinam**
Vice-President : **H. Miller** **Jamaica**
Secretary-Treasurer : **A. Sotomayor Rios** **Puerto Rico**

Board of Directors:

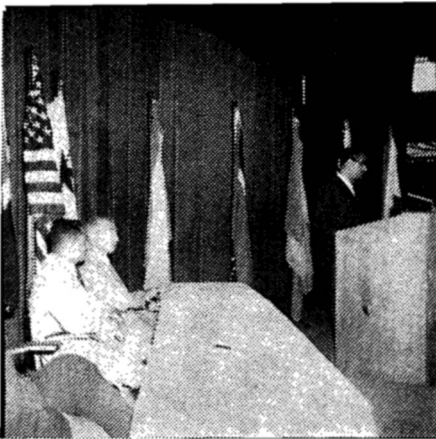
G. Samuels	Chairman	Puerto Rico
R. Bond	Member	U.S. Virgin-Islands
V. Royes	Member	Trinidad Tobago
A. J. Naylor	Member	Jamaica
A. Wan Ping	Member	Guyana
V. Sergeant	Member	Barbados
S. Soutar	Member	Jamaica



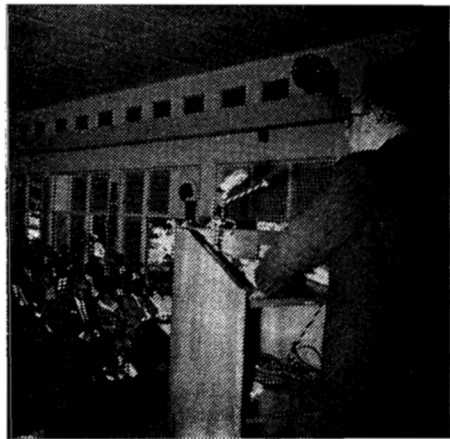
Arrival of some of the delegates at Zanderij airport



Registration of the participants



His Excellency R. L. Jankie, Minister of Agriculture, Animal Husbandry and Fisheries of Surinam giving the welcome address



Ir. G. P. Tiggelman, Director of Agriculture, Animal Husbandry and Fisheries of Surinam giving the Keynote address

Caribbean Food Crops Society
Fifth Annual Meeting
Paramaribo, Surinam
Business Session, July 29, 1967

MINUTES

The Business Session of the Fifth Annual Meeting of the Caribbean Food Crops Society was held at the Agricultural Experiment Station, Paramaribo, Surinam.

Opening:

The meeting was called to order by the President F. A. del Prado M.Sc.

Minutes of the Previous Meeting:

The minutes of the previous meeting were read and approved.

Secretary's Report:

The Secretary Report was read and approved.

Treasurer's Report:

1. Balance, Bank Statement, June 30, 1966	\$1,639.25
2. Receipts: July 1, 1966 to June 30, 1967	<u>1,845.00</u>
Sub-Total	\$3,484.25
3. Expenses: July 1, 1966 to June 30, 1967:	
Travel Expenses Board of Directors Meeting 7-4-67	\$ 94.00
Typing 1965 Proceedings	70.00
Printing 1965 Proceedings	150.00
Travel Expenses President ST to Jamaica	180.00
Expenses— Jamaica Meeting Hotel and others	352.25
Newsletter	23.00
Stamps for Proceedings and Newsletter	125.00
Telephone Calls related Jamaica Meeting	105.00
Addressograph	5.00
Secretarial Help	<u>35.75</u>
TOTAL EXPENSES	<u>\$1,140.00</u>
4. Balance June 30, 1967	<u>\$2,344.25</u>

Board of Directors

The Board of Directors of CFCS met on August 1, 1966 at Kingston, Jamaica. Chairman Dr G. Samuels.

The main items transacted were:

1. Dr A. Sotomayor — Ríos elected unanimously for another term as Secretary-Treasurer.

2. The Caribbean Journal of Agriculture is to be published by CFCS. Mr Hugh Miller was asked to get all the details, budget etc., so it could be circulated among all members.
3. Mr Miller was nominated as Editor of the Journal.
4. The Fifth Annual Meeting will be held in Surinam and the possible sight for the 1968 meeting will be Trinidad and Tobago.

Another meeting of the Board of Directors was held on July 29, 1967 prior to the Business Session.

The main items transacted were:

1. Mr F. A. del Prado was elected Chairman of the Board of Directors.
2. The Sixth Annual Meeting will be held in Trinidad and Tobago July 1968 and the possible sight for the 1969 meeting will be the French Antilles.

Election of Officers 1967—1968:

- President : Lawrence Cross
Agronomist, Ministry of Agriculture, Centeno,
Trinidad
- Vice-President : Vernon A. L. Sargeant
University of the West Indies, St. Augustine,
Trinidad
- Secretary Treasurer: George Samuels
University of Puerto Rico,
Rio Piedras, Puerto Rico

Board of Directors

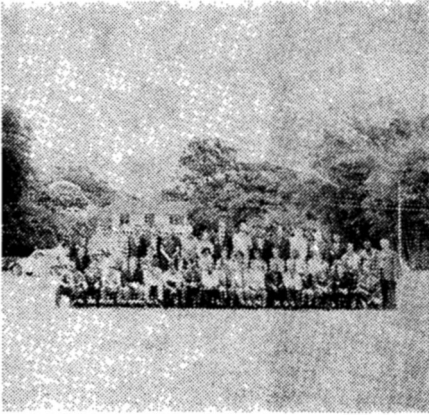
- Chairman : Frank A. del Prado
Plant Protection Division
Ministry of Agriculture
Paramaribo, Surinam
- Members : F. Gabriel
Director of Agriculture
Martinique, French Antilles;
A. G. Naylor
Ministry of Agriculture and Lands
Kingston, Jamaica;
Vernon Royes
University of the West Indies
Mona, Jamaica;
Antonio Sotomayor-Ríos
Corozal, Agricultural Experiment Station,
Corozal, Puerto-Rico;
Simon Soutar
Grace Agricultural Company
Kingston, Jamaica;
Ashton Wan Ping
Ministry of Agriculture
Georgetown, Guyana.

Amendment to the Constitution:

A motion was passed that Article 5 section 5 of the By-laws referring to the length of term of the Board of Directors be changed from a period of three years to two years.

New Business:

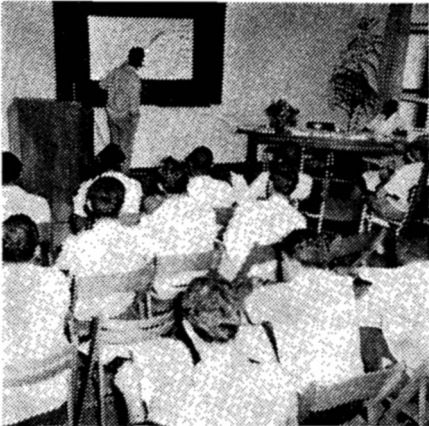
1. A motion was passed that CFCS members in order to provide more active participation in CFCS and to assist its officers, that a local representative be chosen by and for each member country. The appointed representative must receive final approval from the Board of Directors.
2. Mr Frank del Prado notified members that the first meeting of the Caribbean Plant Protection Commission will be held in Paramaribo, Surinam, July 15—22, 1968, just after the CFCS meeting in Trinidad.



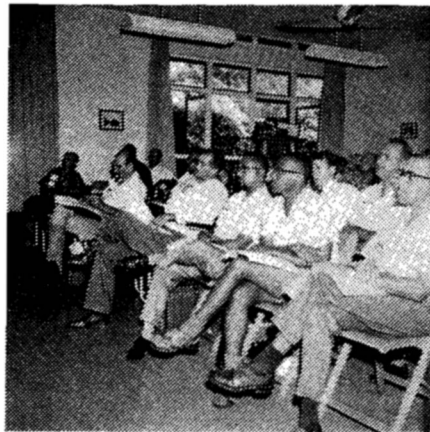
The delegates at the 5th Annual Meeting



H. E. J. Kraag, Deputy Prime Minister and Mrs. Kraag, with H. E. R. L. Jankie and Mrs. Jankie and President and Mrs. F. A. del Prado at cocktailparty given by Government of Surinam



Ir. P. Maas presenting his paper at one of the technical sessions



Delegates listening to papers being presented. Please note that nobody is asleep

Presidential Message by F. A. del Prado

FIFTH ANNUAL MEETING CARIBBEAN FOOD CROPS SOCIETY

Cultural Centre, Paramaribo, Surinam, July 24, 1967

Your Excellency the Deputy Minister President of Surinam, Your Excellencies Ministers of Government, Honoured Guests, Ladies and Gentlemen,

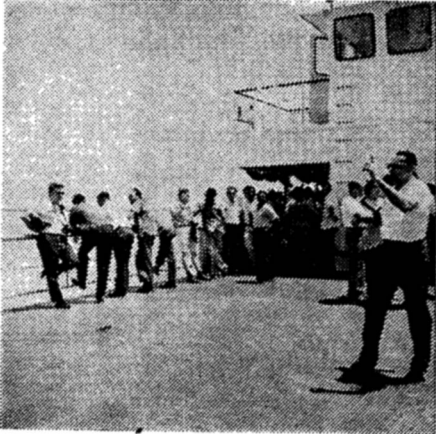
On behalf of the Board of Directors and the Members of the CFCS I must thank your Excellency for your words of welcome. We are very happy indeed that the Government of Surinam has extended the invitation to hold our Fifth Annual Meeting in this country. There are 55 representatives from 17 countries who have come here to attend this conference, a conference which will eventually result in betterment of living standards for many persons in this part of the world.

Apologies for absence were received from His Excellency the Governor of Surinam, H.E. the Minister President of Surinam, the Honourable Errol Barrow, Prime Minister of Barbados, the Honourable J. P. Gyles, Minister of Agriculture and Lands of Jamaica, the Honourable Ralph Paiewonsky, Governor of the U.S. Virgin Islands, Dr. Arturo Roque, and Dr. Lugo Lopez, Director and Deputy Director of the Agricultural Experiment Station at Rio Piedras, Puerto Rico. They have asked me to wish you, the members of this Society a successful meeting in Surinam. Missing today for the first time after the start of our Society in 1963 is our first President and mutual friend Dr. Richard Bond. "Dicky" Bond as we all know him is quite ill at home in St. Croix, I sincerely hope that soon he will be well again, and will be present at our next meeting.

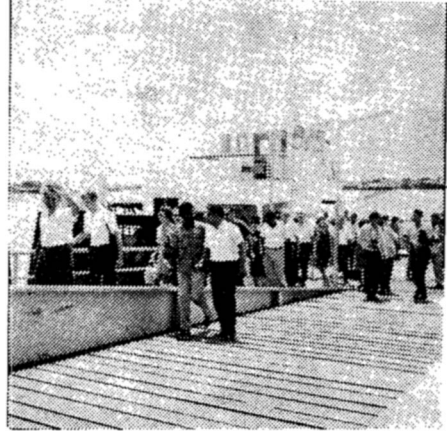
As your President I must also welcome you, but at the same time I am warning you that a strenuous week lies ahead of you. Those of you that have already seen the programme will have noticed that. Approximately thirty papers will be presented which is quite a lot, but we hope to compensate by offering you diversions in the form of some cocktailparties, excursions, one into the interior, and even a boatrip. I sincerely hope that you will be able to attend these functions as much as possible and will get a good impression of the work being done in Surinam.

At this time I must thank the Government of Surinam, all associations, companies and private persons that have somehow contributed. Without your help this conference was impossible. On behalf of the Caribbean Food Crops Society I sincerely thank you all for this help.

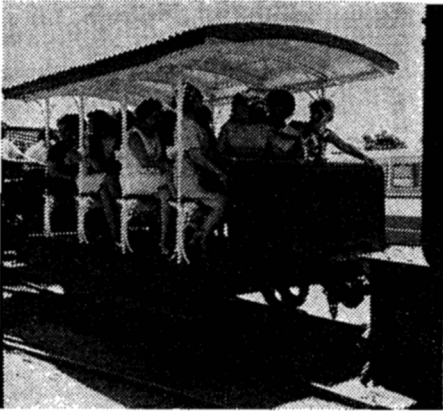
Your Excellencies, Mr. Speaker, Honoured Guests, Ladies and Gentlemen, we are honoured that the Government of Surinam has invited us to hold our Fifth Annual Meeting in this country. I hope that this Society will receive continued stimulation and help from the different Governments in the Caribbean area, and that this meeting and future meetings in a large measure will contribute and result in an increase in food production and an increase in the standard of living of the people of our beloved countries.



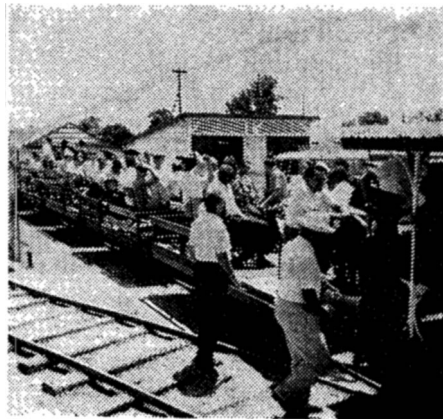
Our President making some announcements on the ferry to Mariënburg Sugar Estate



Leaving the ferry to begin our field trip



The "ladies coach" on our trip around the Mariënburg Sugar Estate



The poor gentlemen had to brave the burning sun

**Address of Welcome by the Honourable R.L. Jankie
Minister of Agriculture, Animal Husbandry
and Fisheries of Suriname**

Mr President of the Caribbean Food Crops Society, Excellencies, Delegates, Ladies and Gentlemen.

It is a great honor for me and I am pleased to welcome you on behalf of the Government of Suriname for this 5th annual meeting of the Caribbean Food Crops Society.

For those, who are not familiar with this organization and its objectives I can say, that this society had its first meeting in 1963 in St Croix of the United States Virgin Islands and that the objectives of the society are:

"to advance Caribbean food production and distribution in all their aspects, to the end of improving levels of nutrition and standards of living in the Caribbean."

In order to reach these objective the Society has regular meetings, during which results of research and investigations are presented and discussed and brought back to the participating countries in order to find their way through our extension services to our farmers.

Up till now very useful information for the agricultural development in our countries has been obtained through the Society and one important and practical result of the work of the Society is undoubtedly the establishment next year with the help and assistance of the Food and Agricultural Organization of the United Nation of the Caribbean Plant Protection Commission.

The agenda of this meeting includes four main items: general agronomy, plant improvement, plant protection and marketing, for discussion, all I expect with a view to the main objective: to advance food production and distribution.

I do not think it necessary for this gathering to explain at length the importance of this objective.

Nearly every day we read about crop failures in certain parts of the world and shipments of food to these areas in order to save people from starvation.

Regularly we are confronted with publications and articles about the increase of the population of the world and the staggering amount of food, that is necessary to improve the present diet and to feed the coming generations.

We all know that this problem of meeting the increasing demand for food is paramount in the developing countries of the world which in 1960 count for about 70% of the world population and where in the year 2000 nearly, 80% of our world population will live.

And we also know, that if we try to answer the question as to what prospects there are that foodproduction can be increased rapidly enough to provide a minimum satisfactory diet for the greater part of the world's population by, say the year 2000, it does not serve much purpose to attempt to answer that question on a global basis.

It is unlikely, that imports of food from the rich to the less rich regions can ever satisfy more than a small part of the needs. This would still remain true even if commercial imports were supplemented by substantial free or cheap surplus foodstuffs.

It is obvious, that we have to examine the question region by region and that we must turn to the regional approach.

And herewith, Ladies and Gentlemen is the importance of the Caribbean Food Crops Society underlined, because it pleads for a regional approach of a problem, which I believe in certain parts of the world already ready and in other parts may become sooner or later one of the greatest of the world.

Turning to our region, the Caribbean and its agriculture allow me to quote a few thoughts from an article of Mr Beckford, published in the journal "Caribbean Agriculture and Science" and entitled **Agriculture and economic development:**

The general case and implications for the Caribbean

It is started there, that economic growth is impossible without complementary agricultural development or, more precisely, a substantial rise in agricultural productivity.

Discussing the implications for the Caribbean, two main questions are considered:

First, what is the required rate of expansion of agricultural production and second what measures should be taken to achieve the required rate of growth

And since the answer to the second question is the theme of this meeting, I would like to quote some relevant passages of the article for this meeting, because I think they are very worthwhile to consider.

„Any plan to increase productivity in agriculture, according to Mr Beckford must be sketched against the background of the economy's resources and requirements of the various sectors. And in this connection the scarcity of capital relative to other factors of production is most relevant to the Caribbean.

It is suggested that the need for capital is far greater in the non-agricultural sector where heavy demands are made for investment in infrastructure, social services and manufacturing and construction activities, on the other hand, there is considerable scope for increasing agricultural productivity with modest outlays of capital. The greatest need, therefore, is to develop capital-saving techniques of production for agriculture.

On the whole, the Caribbean has not yet reached the stage where labour-intensive methods of production are inappropriate. But there is considerable scope for raising productivity without changing the present organization of agriculture, but by utilizing more fully resources that are already abundant. Production in many areas could be doubled by growing two crops a year instead of one. In addition, yields could be more than doubled with better varieties, and cultural practices.

There is obviously a great need for government participation in a programme of this nature.

Research services, provided by governments and universities, should be directed to the **development of higher yielding varieties of crops** and varieties that will grow well throughout the year, suitable crops and livestock combinations and crop rotations, fertilizer requirements of different crops and varieties and so on. The most striking needs appear to be in the areas of **plant breeding and plant nutrition.**"

Ladies and Gentlemen, the society is not only concerned with production in all their aspects but also with marketing and distribution.

This aspect of "production" in the broader sense of the word I would say, is not seldom overlooked and in many cases does not get the attention it should receive.

Since a very large part of our Caribbean population lives in urban areas, it is not enough that food production be adequate for their needs; this food must be brought to the places where they live and work and must be available at prices they can afford.

Effective marketing is not only critical for the success of national development programs as a whole; it has also a great impact on production. If the producer does not have an accessible market outlet where he can sell the food he produces beyond his own needs, then he has little incentive to produce it.

And I think that in this field although much has been accomplished, still **much more** can be done and **should be done.**

I am therefore pleased, Mr President, that you have included in your agenda for study and discussion the marketing of agricultural produce and I am looking forward to the results.

Mr President, Ladies and Gentlemen, I think I have already taken too much of your time, that you should devote to technical and economic discussions and therefore I like to conclude with welcoming you again to Suriname and wishing you, fruitful discussions, with results, that will bring us a step forward to the solution of our common problem: producing enough food for our people against prices our people can **producing enough food for our people against prices our people can afford.**

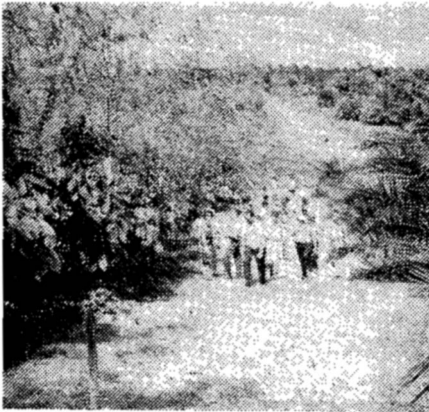
Thank You.



Mrs. Samuels and Mr. Morris in front of one of the bushnegro huts at Open Air Museum



At the experimental field station "Brokoba" in the interior; Mr. J. I. van Dijk, Manager, far right front



Delegates touring the field station seeing coffee and oilpalm plantings



Listening to an explanation of the hydroelectric dam at Afobaka

**Address by Ir. G.P. Tiggelman, Director of Agriculture,
Animal Husbandry and Fisheries**

The Land

Surinam is, compared with many Caribbean Countries, a large country. It covers an area of approximately 143.000 square kilometers or 55.000 square miles.

Topographically and pedologically this area can be divided into four regions:

- The young coastal plain, a strip, 30 km wide on an average, along the Atlantic coast.

Eighty percent of the soil of this plain consists of a low level, heavy alluvial clay type. In several parts, this clay zone is interspersed by series of low ridges, consisting of sand and/or shells and rising to a height of a few decimeters to a few meters above the level of the surrounding clay. This so-called Demerara formation, covers an area of 17.000 square kilometers.

- The old coastal plain or Coropina formation, stretches out over a width, varying from 20—70 km south of the Demerara formation and consists mainly of complexes of sandy and silty sediments, separated from each other by low creeks and swamps.

Most of the population, estimated in 1966 at 347.000 persons, lives in the young and old coastal plain. Most of the agricultural activities have also taken place in the young coastal plain. The low level of the soils in this area has necessitated the use of dikes and sluices to keep out the seawater and drain the soil. The distinctive feature therefore of Surinam agriculture is its poldersystem.

- South of the Coropina formation, which covers an area of 4.000 square kilometers, we find the savannah belt. 12.000 square kilometers with coarse sandy soils, with varying amounts of clay and of poor structure and quality.

- The fourth region is the interior, or geologically the Guyana system, covering about six-sevenths of the country and consisting of rock formations mostly of precambium origin. The soils vary according to the rock formations.

Of this huge area, only a very small part is under cultivation, mainly situated, as I already have said, in the young coastal plain. In 1966: 46.000 hectares were under crops or used for pasture, or about 0,32% of the total area of the country.

Types of farming

Leaving the shifting cultivation of the autochthonous Amerindian population out of consideration, plantation farming was the first type of agricultural undertaking in Surinam. The first plantations were established around 1650. These plantations were small polders, constructed along the riverbanks in the marshy land, lying below the high water mark.

In 1785, 591 plantations were in operation with sugarcane as the first and for many years the most important crop. Sugar was later followed by cotton, cacao, coffee, bananas and during the last few decades by citrus and rice.

Plantation agriculture, however did not remain at its peak level for any

length of time and in the beginning of the 19th century an obvious regression set in which lasted till the end of World War II.

Small scale farming in the country developed out of small plots of land, planted with food crops and worked by freed slaves on the plantations. The Government took steps to encourage settlement on the land and cultivation of food crops, but also after the abolition of slavery in 1863, no important development of small scale farming took place.

And that is understandable, if we realize that of the 300.000—350.000 immigrants from African countries, only 50.000 were left at the time when slavery was abolished. Few were willing to remain on the land, and nearly all of them moved to the capital Paramaribo.

An important change in this situation was brought about by the agreement made with the British Government in 1872, regarding the immigration of Indian labourers to work on the plantations.

These immigrants settled on the land, once their contracts had expired and after 1914, when the Government withdrew certain restrictions on the settlement of Indian immigrants, small scale farming developed steadily. Later Indonesian immigrants swelled the ranks of the small farmers, and to-day there is a large group of Creole, Hindustani and Javanese farmers.

Many of our farmers are still small scale producers, they work on the land with rather simple equipment and the marketing of their products is in many cases not well organized. They often rely for their subsistence on what they produce, although many of them do not depend entirely on their holdings but derive part of their income from fishing, work on plantations, government employment or other sources. Crops are largely seasonal, especially on the rice farms, and long gaps occur, during which no direct income is received from the farm.

To complete the "types of farming picture", the shifting cultivation of the Negroes and Amerindians in the interior, ought to be mentioned.

The men cut and burn their grounds during the long dry season. During the following short rainy season, the women plant several crops (corn, peanuts, rice, cassava, yams, etc.) Each plot is normally only used for two years and after that is given prey to quickly overgrowing secondary vegetation. Much land is required by this system of shifting cultivation and in some areas a shortage of land can be observed due to the growing population.

Agriculture in the nations economy

From the point of view of employment, agriculture is the most important economic activity. In 1964 the total number of workers in agriculture and fisheries amounted to nearly 40.000. In the other sectors of the economy 47.000 persons were employed.

Surinam's national product however, is mainly formed by mining, especially the mining of bauxite. Although in this sector a small number of workers is engaged, the gross domestic product of mining in 1963 amounted to 28,4% of the total, against agriculture, animal husbandry and fisheries with 10,2%.

Developments

Although there is still a great deal to be done, in order to reach the objectives of our development program for agriculture, animal husbandry and fisheries certain developments have taken place, I believe, which are worth mentioning. They are the result mainly of our Ten Year Plan,

an overall economic development plan, which was started in 1955. The agricultural area increased from 38.000 hectares in 1954 to 46.000 hectares in 1966.

The gross value of the production of the sectors agriculture, animal husbandry and fisheries increased from Sf. 17 million in 1954 to Sf. 41,6 million in 1966. And agricultural exports rose from Sf. 3,8 million in 1954 to Sf. 13,2 million in 1966.

The increase of production in the sectors agriculture and animal husbandry has not only been effectuated by the expansion of the cultivated area, but also by the fact that, on an average, higher yields per area or livestock unit were obtained.

But as I have said, we have certainly not reached the objectives of our development program, of which the first is:

— Increase of production (1) for a considerable increase of agricultural export commodities (2) for the development of an agricultural processing industry and (3) for replacing agricultural imports by local products.

As far as agricultural commodities are concerned, we have been able to add to our traditional main exportcrop rice, bananas.

The bananaprogram was started in 1960. The total acreage planted with bananas at the end of this year will be about 1.600 hectares and we expect an export of 25.000 tons with a value of Sf. 3 million. The largest part of the area is owned and exploited by a government agency. But it is intended to introduce this new exportcrop gradually on a number of small and medium sized farms. For that reason, we are in the process of establishing a system of satellite farming. Around a large bananafarm, small and medium sized farms will be established.

The large farm, called "nucleus farm", will take care of packing and shipping of the crop of the surrounding farms and act as a service centre for the farmers. One experiment has been started at Santo and plans are in preparation for other areas.

A similar development is taking place at the Wageningen project, a large rice plantation of about 7.000 hectares. We are establishing there medium size rice farms of about 24 hectares, fully mechanized and of which at the end of 1968, 40 will have been settled with farmers. The crop is sold by the farmers, to the Foundation, who exploits the Wageningenproject and they receive from the Foundation the necessary help and advise to farm their land properly. For these services the farmers pay.

It is believed that this system of satellite farming might be an answer to the many problems encountered, when export crops are introduced in small scale agriculture. But let me make it clear, that we have not solved them all yet and it certainly will take more time, more study and more experiments to find the right solution.

We have not been so successful in increasing production for, nor in the development of foodindustry. Nevertheless a dairy, meat processing plant, some livestock feed mills, a flourmill, a coconutoil press, some large rice mills and a shrimp industry have been established.

There are good possibilities for a plant for processing tropical fruits, and for the processing of fish, and we hope that establishment will be possible in the coming years.

Very recently the laying-out of an African oilpalmplantation of 1.200—1.500 hectares has been discussed. Our experiments have shown, that a production of 4 tons of oil per hectare is possible, which is considerably higher than in many African countries.

If this enterprise is going to be undertaken and the results come up to expectations, Surinam might become an important producer of palmoil, because there are large areas of suitable soil, with the right climate for this crop.

Replacing agricultural imports by local products has been difficult. Certain commodities we will always have to import, but other should and also can be replaced by local products.

The total value of agricultural imports, which amounted to Sf. 9.9 million in 1954, rose to 18,3 million in 1965.

Imports consist of considerable quantities of meat and meatproducts dairy-products, fish and fishproducts, grains and grainproducts and fruit and vegetables. The coming years special attention will be paid to this aspect of production, because as the Minister already has mentioned, there is considerable scope for increase in production of food crops and livestock products, with modest outlays of capital, and that particularly in the existing agricultural areas, where these commodities are produced by small farmers and a system of parttime farming prevails.

As far as the other two aims of the development program are concerned; (2) the improvement of the income of the farmers and (3) the creation of employment in the agrarian sector in such a way, that a considerable part of the increase of the agrarian working population can be, gainfully employed in this sector, I would like to mention that nearly 2.300 families were settled in new small and medium sized farms. And for another 2.000 persons permanent employment was created in the large rice plantations, the bananafarms and some other smaller agricultural enterprises

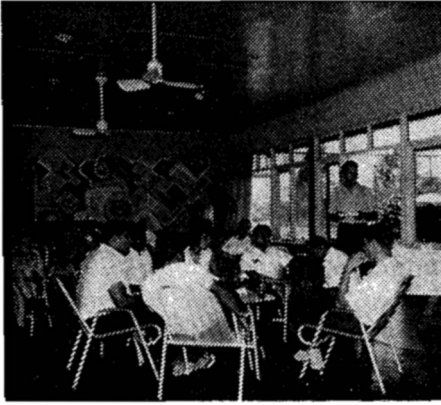
About agricultural income, I cannot give you accurate figures, due to the lack of precise data. I think it is right to state, that the average increase of a farm family income has been rather small, which for the greater part is caused by mounting production costs.

After having reviewed the past ten years of agricultural development, I sincerely believe, that although certain developments have not taken place in a manner and to such an extent, as was expected, much has been learned and much has been accomplished to look with confidence to the future.

Therefore an other development program for the period 1967—1976 has drafted and we are now preparing detailed projects and programs for the next five years.

A considerable amount of money will be spent for the improvement of drainage and irrigation, the construction of new polders and for the expansion of the roadsystem and social facilities in the rural areas, in order to make living on the land more attractive. Other important projects are the establishment of an agricultural creditbank, improvement of drying and storage facilities and a program for improvement of marketing and distribution of agricultural products. In this respect I may mention the new central market and the new fisheries base, with possibilities for ice-production and coldstorage.

I hope Ladies and Gentlemen, that I have been able to give you a general view of the development of agriculture in our country and may I conclude with expressing the hope, that this meeting of the Caribbean Food Crops Society will again be of great help to all of us in furthering agricultural development, so important for the economic growth of our countries.



Mr. G. Bos, acting manager of the Mariënburg Sugar Estate giving his welcome speech



Lunch at Mariënburg; delicious "rijsttafel" buffet



Delegates enjoying their lunch



A walk through the Open Air Museum of Fort Nieuw Amsterdam

**Address by the Honourable Lionel Robinson Minister of Agriculture,
Lands and Fisheries, Trinidad and Tobago at the Fifth Annual Banquet
Torarica Hotel, July 29, 1967**

I am extremely pleased and honoured to have the opportunity to be here in Paramaribo to address this distinguished gathering of agriculturist and agricultural scientists, as well as those of you who like myself have no specialised technical knowledge, but who nevertheless are deeply concerned about the progress and the fortunes of agriculture in general and Caribbean agriculture in particular.

We live at a period in time, when a substantial number of people in the so-called developing areas of the world are menaced by the spectre of hunger and the crippling effects of malnutrition. Stirring appeals have been made by several of the world's most prominent leaders for the need to seek solutions to this awesome problem, and I believe that many of you will recall the statement of the late President Kennedy at the world Food Congress in Washington a few years ago when he urged all nations to eliminate hunger from the face of the earth in our lifetime through individual and collective action.

Dr. B. R. Sen the Director-General of the Food and Agriculture Organisation has himself continuously drawn the attention of the affluent nations of the world to the recurrent agricultural crises which confronts the leaders and the peoples of the developing nations. Through his efforts, and the valuable work performed by the organisation which he so ably directs, there is no longer any doubt about the immensely important role which agriculture has to play in the developmental process. We no longer tend to have, therefore, those largely sterile discussions and arguments about whether the developing countries should concentrate almost exclusively on industrialization, for we recognise now as Prime Minister Nehru so bluntly stated that: "if we fail in agriculture than we fail inevitable and consequently in industry also."

We know that the relationships between agricultural development and economic growth may tend to be different from country to country, but we also fully realise I believe, that to ignore the agricultural sector or to fail to allocate resources to it, will merely serve to impose a severe constraint on the entire economy and seriously inhibit progress.

Statistical studies and analysis have revealed that the Latin American nations have barely been able to prevent their part of the world from being designated a food deficit area, but the failure of production to increase significantly or to keep pace with population growth especially in urban areas has given rise to all sorts of problems and contributed in no small measure to the chronic inflationary pressures which afflict so many of our neighbouring countries in this region, and adversely affect their development.

The situation in Asia and the Far East is more serious and we are all aware of the terrible food shortages that have occurred in India, and the fact that countries in that region which had hitherto been exporters of food are present importing their requirements to an ever increasing extent and have, therefore, now become net importers.

In the Caribbean region we have been more fortunate, for while it is impossible to say that all our citizens obtain all the food they require and have balanced and nutritive diets, serious food shortages are comparatively unknown, and thus we continue to say that there is little starvation around here. I think that we are beginning to realise, how

ever, that food can be obtained in three ways: by domestic production, by commercial imports, or through foreign aid, and that if we do not receive food aid, or produce enough food domestically that we in actual fact obtain most of our supplies through commercial imports, paying for these imports with foreign exchange received from the exports of other products.

The question is, therefore, how long can we continue to use foreign exchange which we should be utilising to promote and establish manufacturing and other industries to pay for the importation of food, a substantial quantity of which we could in fact produce ourselves.

Another fact which I believe I ought to mention and emphasise, and which we should all consider, is the point made by Messrs. Beckford and Guscott of the University of the West Indies in their recent paper on "Intra-Caribbean Agricultural Trade, and this is that "Agricultural production and trade in all West Indian territories have been traditionally geared to extra-regional markets, particularly the United Kingdom and Canada. Each territory produces a narrow range of export crops for these markets and depends heavily on imported foodstuffs from outside the region."

This means, that in addition to the cost of our food imports and the substantial food import bill which some of our countries have to meet, very little has been done so far to stimulate intra-regional trade in agricultural and food products, as a large proportion of our imports, continue to come from outside the region. The cost to be borne is, therefore, it appears to me both an individual or national cost as well as a collective or regional cost.

I would like to state at this point, that my remark or observations are not intended and should not be regarded as criticisms of the policies of any Caribbean Government for I am merely attempting to pinpoint or to focus attention on certain features of the Caribbean agricultural scene which I feel may be of interest to this audience. These are factors which are not continuous and increasing concern to me as Minister of Agriculture in Trinidad and Tobago, and thought that I would share my burdens and my problems with you especially as you appear to be in a particularly receptive mood or frame of mind and would thus be inclined to be more tolerant than you might otherwise be.

I think that we have been in this field long enough to realise that it is a fact that agricultural development is an intricate exercise, and that planning in the agricultural sector presents a number of special problems and difficulties which are sometimes not clearly understood, and when understood are not easy to overcome in the particular conditions prevailing in our several countries. While therefore, there is a great deal of scientific and technical knowledge available for revolutionizing backward agriculture, and while the use of fertilisers, better seed and disease control methods for crops and animals may result in dramatic increases in output without any appreciable expansion of the agricultural acreage, this has not been the general experience in many developing countries although in some of them as for instance Mexico and Taiwan significant progress has been achieved.

I believe that we would all agree that the shortage of capital for investment in agriculture is a problem, but as has been emphasised it is only one of the essential elements and its investment has been retarded by a variety of structural weaknesses in the economies of the developing nations. In Trinidad and Tobago we have recently embarked on an extensive land settlement and development project designed to establish

1,800 farm units over a four year period on approximately 12,000 acres for the production of milk, pork, vegetables, foodcrops, tree crops and tobacco. This programme is the first major step towards the diversification of the agricultural sector, and will involve the investment of approximately T & T \$20 million of which T & T \$8,5 million will be advanced by the World Bank. Although the project has only really just commenced we have begun to realise what a high degree of organizational effort is required and what a substantial amount of the total allocation has to be invested in services and infrastructure development if success is to crown our efforts.

The observation made by Dr. Yudelman a World Bank economist on the role of the public sector in promoting agricultural development is thus quite appropriate, for he has pointed out that since agriculture is in the private sector and because it is atomistic in structure it does not generate many of its own external economies. Many of the kinds of services that are provided within manufacturing industry by individual manufacturing firms **have to be provided by the government for farmers.** Farmers cannot do their own research, provide and train their technicians or generate much in the way of self-financing or expanding credit to be used by the agricultural sector. Thus he concludes, the role of the public sector assumes great importance in promoting agricultural development.

I have referred to this feature of agricultural development to illustrate another point as well, and that is the lack of human resources to plan and implement programmes in the agricultural sector. Skilled people are required at all levels in research, extension, credit, farm management and agricultural education but we are woefully short of this type of talent, and I believe that this must be true as well for many other countries in the Caribbean region. We all recognise the need for an expansion of food production and food processing in the region for the reasons I mentioned earlier, and given the obstacles nothing short of a concerted effort using all the resources human and otherwise which we can muster will suffice.

In this exercise the Caribbean Food Crops Society can play a very positive and constructive part, especially as the aims and objects of the Society are quite wide and very comprehensive including not only the co-ordination of research but also the dissemination and exchange of material and the provision of a regional consultant service on food crop production.

I know that you are already engaged on a full programme of work, and that in addition useful contacts have been established by your Society with organisations and institutions which are also quite active in this field. This augurs well for the advancement of knowledge in the very vital area of agriculture in the Caribbean and I can only say that I sincerely hope that your efforts and enterprise are successful and productive.

We in the Government of Trinidad and Tobago are deeply appreciative of what you are endeavouring to do, and we hope that you will honour us by holding your next meeting in our country. I, therefore, officially extend to your society this invitation on behalf of the Government and people of Trinidad and Tobago. Before closing I would like to say how happy I am to be in Surinam once again and to particularly thank the Minister of Agriculture of Surinam and all those officials who are always so keen to see that everything is done to make me comfortable.

Finally to the officials and members of the Caribbean Food Crops Society let me say thanks once again for your invitation and for the privilege afforded me to address you on a subject which is extremely dear to my heart. May your deliberations be eminently successful, and may your society go from strength to strength in the coming years which I am certain will be decisive ones for Caribbean Agriculture.

Thank you.

**Address by the President F. A. del Prado at Fifth Annual Banquet
Torarica Hotel, July 29, 1967**

Mr. Chairman,
Honourable Ministers of Government
Hon. Guests, ladies and gentlemen.

Just as the sun rises every morning and goes down in the evening, each event has a start and also an end. Now we are together at the last official event of the 5th Annual meeting of the CFCS.

We have been together in Surinam for 8 days, 63 delegates from 14 countries working together and listening to papers on agricultural research, economics, marketing and other specialized fields.

Again we have learned from each other, which will result in a benefit to our farmers.

They will with this information be able to put into practise the production of more and better food, due to the use of better agricultural methods and the use of better and more resistant varieties of different food crops.

However there still is a negative correlation between technological development and economic development. At nearly all the previous meetings we have spoken of a Caribbean economic integration.

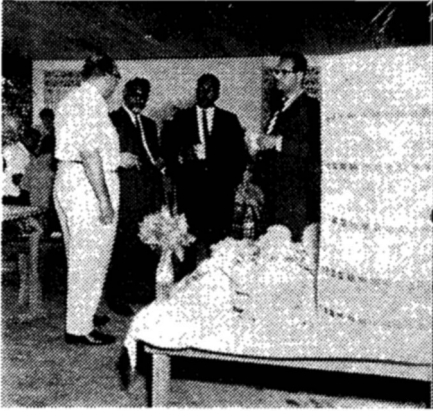
Now it is our task to interest our different Governments, because it is the only solution for all of us in the Caribbean that depend to a large degree on imports.

I know that several Governments are already interested, but interest is not enough.

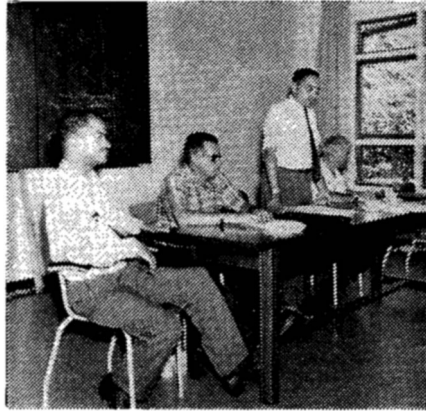
We must put our hands together trying to find a solution, a solution which eventually will result in more and better food for the undernourished in the Caribbean.

More food is needed for a dignified life and it is the duty of us agriculturists, economists and marketing specialists to do something about it.

I told you at the general meeting this morning that I am a happy man. Happy because I was told by many of you that our meeting was a success. Let's not only consider the success of one meeting, but let's hope that what we gained and learned at this meeting in Surinam will result in a better standard of living for our less privileged fellowmen.



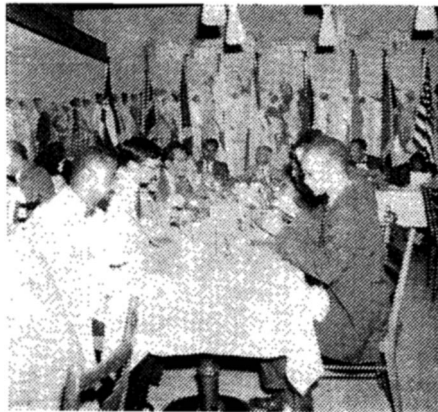
At the Banana Estate Jarikaba (right to left), His Excellency Minister R. L. Jankie from Surinam, Honourable L.M. Robinson, Minister of Agriculture from Trinidad and Tobago, Senator Ramzan Ali from Trinidad, and Ir. C. Tiggelman from Surinam



Election of members of the Board of Directors



Fifth Annual Meeting Banquet at the Torarica Hotel, head table



Members enjoying their dinner at the banquet

**Caribbean Food Crops Society Fifth Annual Programme 1967
Paramaribo, Surinam**

Saturday July 22

Participants arrive at Zanderij Airport. Transportation provided to hotels

Sunday July 23

1000 Registration at the Torarica Hotel

Monday July 24

0745 Participants transported from hotel to Surinam Cultural Centre

0800 Registration continued

0830 OPENING CEREMONY

Opening: Dr G. Samuels, Chairman Board of Directors CFCS.

Address of welcome: His Excellency R. L. Jankie, Minister of Agriculture, Animal Husbandry and Fisheries of Surinam.

Reply: F. A. del Prado M. Sc., President Caribbean Food Crops Society.

Keynote address: Ir G. P. Tiggelman, Director of Agriculture, Animal Husbandry and Fisheries of Surinam.

Closing remarks: Dr G. Samuels, Chairman Board of Directors CFCS.

Meeting of delegates with official persons.

1030 Participants leave for Surinam Agricultural Experiment Station

1045 Conducted tour of Agricultural Experiment Station

1215 Participants leave for hotel

1230—1400 Lunch

1415 Participants leave for Agricultural Experiment Station

1430—1545 Presentation of papers

1545—1600 Refreshments

1600—1730 Presentation of papers

1745 Participants leave for hotel

1900 Dinner

2030 Cocktailparty presented by His Excellency R. L. Jankie, Minister of Agriculture, Animal Husbandry and Fisheries of Surinam at the Torarica Hotel

Tuesday July 25

0730 Participants transported from hotel to Agricultural Experiment Station

0800—1000 Presentation of papers

1000—1030 Coffee break

1030—1230 Presentation of papers

1245 Participants leave for hotel

1300—1400 Lunch

1415 Participants leave for Agricultural Experiment Station
 1430—1545 Presentation of papers
 1545—1600 Refreshments
 1600—1730 Presentation of papers
 1745 Participants leave for hotel
 1900 Dinner
 2030 Boattrip. Transportation will be provided

Wednesday July 20

0730 Participants transported from hotel to Agricultural Experiment Station
 0800—1000 Presentation of papers
 1000—1015 Coffee break
 1015—1145 Presentation of papers
 1200 Leave experiment station for hotel
 1215 Leave hotel for ferry Paramaribo
 1230 Travel by ferry to Meerzorg then by bus to Zoelen and by train to Marienburg
 1330 Lunch at Sugar Estate Marienburg, presented by the Estate Manager
 1530 To Fort Nieuw Amsterdam, visit Museum
 1645 Party at house of Mr. and Mrs. J. Douglas, District Commissioner of Commewijne
 1800 Depart Fort Nieuw Amsterdam for Leonsberg by launch
 1845 Return to hotels
 Evening Free

Thursday July 27

0600 Breakfast
 0630 Depart hotel to visit Agricultural Experiment Station Farm at Brokobaka in the interior
 1130—1200 Visit hydroelectric dam at Afobaka
 Lunch at Brokopondo
 1700 Arrival at hotel
 1900 Dinner
 2015 Leave hotel for Agricultural Experiment Station
 2030 Surinam show at Experiment Station

Friday July 28

0730 Participants transported from hotel to Agricultural Experiment Station
 0800—1000 Presentation of papers
 1000—1030 Coffee break
 1030—1230 Presentation of papers
 1245 Participants leave for hotel
 1300—1415 Lunch
 1430 Participants leave for field trip to Oryza rice seed station at Oryza, and Jarikaba Government Banana Estate
 1700 Participants leave Jarikaba for hotel
 1945 Depart for Cocktailparty given by Mr. and Mrs. R.R. Lo Ten Foe, Division Manager Esso Standard Oil S.A.
 2000—2200 Cocktailparty Mr. and Mrs. Lo Ten Foe

Saturday July 29

- 0730 Participants transported from hotel to Agricultural Experiment Station
- 0800—0900 Presentation of papers (Optional)
- 0900—1100 Annual General Meeting CFCS. Election members Board of Directors
- 1100—1115 Coffee break
- 1115—1200 Annual General Meeting CFCS continued
- 1215 Participants leave for hotel
- Afternoon free for shopping
- 2000 Fifth Annual Meeting Banquet Torarica Hotel, Guest speaker His Excellency Lionel Robinson, Minister of Agriculture and Lands, Trinidad and Tobago. Departure of some delegates by SLM flight PY 948 to Guyana, Trinidad and Netherlands Antilles with connections to other places at 1445

Sunday July 30

- Free
- Departure of some participants at 1330 by PAA flight 230 Guyana, Trinidad and Barbados with connections to other places

Monday July 31

- 0830 Depart from hotel for field trip to the Fruit Crop Plantations at Santo and Boma. Visit to Agricultural Technology Station
- 1230 Depart Technology Station for hotel
- 1300 Lunch
- Departure of some delegates to French Guyana at 1615 by Air France flight 975. Or to Guyana, Trinidad, Netherlands Antilles by ALM flight LM 948 at 1445, with connection to other places
- Afternoon and evening free

Tuesday August 1

- Departure of delegates by BWIA flight 464 at 2145 to Guyana and Trinidad, or by Air France flight 974 to Guyana, Port of Spain, Barbados, Martinique and Guadeloupe

List of Participants 5th annual meeting CFCS, Paramaribo July 24-31 1967

1. F. W. van Amson M.Sc.	Suriname
2. Ir. E. W. van Brussel	"
3. I. CH. da Costa	"
4. A. H. van Dijk M.Sc.	"
5. Dr. W. Donner	"
6. R. R. Huiswoud	"
7. D. R. Hindorie	"
8. E. Hooghiemstra D.V.M.	"
9. S. L. Katyal M.Sc.	"
10. Ir H. Lionarons	"
11. Ir P. W. Th. Maas	"
12. F. A. del Prado M.Sc.	"
13. W. B. Relyveld	"
14. Ir G. Hindorie	"
15. J. Drielsma	"
16. B. van den Broek	"
17. E. R. Sewpersad	"
18. G. Lum Chou	"
19. Edmond J. A. King	Antigua, W.I.
20. Winter Headley	Barbados
21. W. de Courcey Jeffers	"
22. Bisnodat Persaud	"
23. John Grace	"
24. Richard M. Hoad	"
25. M. Soitout	France
26. F. Blamont	French Guyana
27. J. Cordeil	"
28. D. Marrie	"
29. J. L. Roque	"
30. Jean François Turenne	"
31. Ch. P. Kennard M.Sc.	Guyana
32. M. Ramnarainc	"
33. Bernard Digat	Guadeloupe F.W.I.
34. A. G. Naylor M.Sc.	Jamaica
35. Dr. J. Sessing	"
36. Richard Strauss	"
37. Hugh C. Miller	"
38. H. S. Brodber	"
39. Linnell M. Edwards B.Sc.	St. Kitts W.I.
40. F. Gabriel	Martinique
41. César Von Chong M.Sc.	Panama
42. Dr. George Samuels	Puerto Rico
43. Raul Abrams	"
44. William Pennock	"
45. Dr. A. Sotomayor—Ríos	"
46. Miguel González Flores	"
47. Carlos E. Aponte	"
48. Lawrence Cross	Trinidad
49. John Cropper	"
50. T. Hoshall	"
51. Samuel R. Morris	U.S.A.
52. Dr. C. Swanson	"
53. Dr. William Vernon Royes	Jamaica

54. Ir V. K. R. Ehrencron
55. Ir G. P. Tiggelman

Suriname

Ladies attending from abroad

Mrs J. F. Turenne
Mrs G. Samuels
Mrs C. Swanson
Mrs L. Edwards
Mrs D. Marrie
Mrs F. Gabriel
Mrs J. Grace
Mrs W. Pennock

**Caribbean Food Crops Society Fifth Annual Conference
Paramaribo—Surinam 1967**

Organizing Committee

Chairman: F. A. del Prado M. Sc.
Secretary : Miss E. de Miranda
Members : Ir G. Hindorie
 R. Huiswoud
 J. Drielsma

Housing and Transport Committee

Chairman: J. Drielsma
Members : R. van Leesten
 R. Samlall
 J. Lum Chou (Shell Suriname N.V.)
 R. Huiswoud

Ladies Committee

Chairman: Mrs. Dr. V. Tiggelman—Van Krugten
 Mrs. L. H. del Prado—Robles
 Mrs. E. F. Ehrencron—Ketelaar
 Mrs. M. M. Smit—Brunings
 Mrs. M. A. Hindorie—Chundro
 Mrs. N. H. Drielsma—May

Reception and Departure Committee

Chairman: R. Huiswoud
Members : R. Krieger
 R. van Leesten

Publicity Committee

Chairman: J. Drielsma
Members : S. Katyal M.Sc.
 W. L. Relyveld

Special Services Committee

Chairman: R. Huiswoud
Members : Miss A. Ormskerk
D. R. Hindorie

Entertainment Committee

Chairman: R. Huiswoud
Member : Miss E. de Miranda

Medical Committee

Dr. E. Hagens D.D.S.
Dr. J. C. de Miranda D.D.S.
Dr. C. H. J. Loe M.D.
Dr. G. K. Brunings M.D.

Secretarial Services Committee

Miss E. de Miranda