harvest

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PAPUA NEW GUINEA

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Front cover: Aerial photograph of the coast close to Port Moresby with a patch of Red Tide in the water (see page 129).

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Department of Primary Industry
Port Moresby
Papua New Guinea

MAKING PINEAPPLES FRUIT

By R. Michael Bourke, Agronomist, Lowlands Agricultural Experiment Station, Keravat

In PNG pineapples flower and fruit only at certain times of the year. Farmers can control flowering very easily and cheaply by putting a chemical on the plants and have fruit when there are few on the market and prices are high. Because flowering occurs naturally when the nights are cold, the hormone should be put on when the nights are warm.

All that is needed is a bottle of hormone called Phyomone and an empty fish tin. A few drops of hormone are mixed with water and this solution placed in the middle of the plant. A flower will then form and about five months later the fruit from this flower will be ripe. The hormone has no bad effect on the fruit. It works much better on rough leaf than on smooth leaf pineapples.

Smoke and chemicals such as carbide and B.O.H. can also be used to make pineapples flower. Carbide works very well on both rough leaf and smooth leaf pineapples.

Pineapple fruit do not ripen all year but only in some months. In many places in PNG fruit usually ripen between November and February in a flush, that is, a lot of fruit are ripe about the same time. In some places there is often another flush a few months later in the first half of the next year and then not so many fruit for the rest of the year. The time of the flushes varies from year to year. The fruiting pattern for a block at Keravat for 1973 to 1976 and a block at Popondetta for 1969 to 1971 is given below to show this.

When night temperatures are low, the flowers start to form inside the plant. This means that all the farmers in one area have their fruit ripening about the same time and prices in the markets are low. However smoke and certain chemicals can be used to make plants flower and carry fruit out of season. By using one of these chemicals a farmer can make plants fruit out of season and take advantage of high prices. He can also obtain fruit right throughout the year. Normally once a plant reaches a certain size, flowers are formed during the next natural flowering period. But by applying a flowering chemical, fruit can be made to form at any time.

In Papua New Guinea pineapples sometimes grow for many years without producing a fruit. This is because there are not very large seasonal differences like winter and summer. But if a farmer makes his pineapples fruit quickly with a chemical, he can make more money from selling them earlier.

Flowering hormone

The chemical most commonly used is A.N.A. (alpha napthalene acetic acid) which is a hormone or natural growth substance. This is sold under the ICI trade name Phyomone. It is very cheap and easy to use. All the farmer has to do is to mix a little hormone with water, stir it and pour the solution into the heart of a pineapple plant.

Six to eight weeks later a red colour will appear in the heart of the plant. This is the start of the flower. The fruit that forms from this flower will be ripe 20 to 24 weeks (4½ to 5½ months) after putting on the hormone for rough leaf pineapples. For smooth leaf it

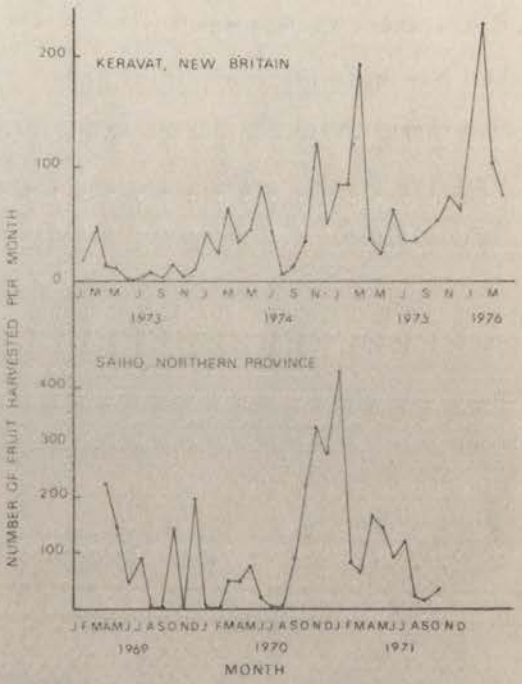


Figure 1.—Monthly pineapple yields from Saiho and Keravat. Note how production is highest in the months either before or after Christmas, but the pattern varies a lot from year to year. Flowering is caused naturally by periods of weather when the night temperatures are low and there is a lot of sunshine in the day.

Mixing up the flowering hormone. Twenty-five drops of hormone are needed for an ice cream container of water. This is enough for about 40 plants. The fish tin is used to pour the solution on to the plants. One fish tin holds enough solution for 7 plants.

Pouring the flowering hormone solution into the heart of the pineapple plant. It takes 20 to 24 weeks from putting on the hormone until the fruit is ripe for rough leaf pineapples.

Amount of hormone for different containers

Container	*Approximate volume*	*Amount of hormone needed*	*Approximate number of plants*
Fish tin	430 ml	4 drops	7 plants
Ice cream container	2.5 litre	25 drops (about 1 ml)	40 plants
2 gallon bucket	9 litre	5 ml (100 drops)	155 plants
44 gallon drum	200 litre	100 ml	3 500 plants

takes 26 to 30 weeks from putting on the hormone till the fruit is ripe.

The farmer makes a 1:2000 solution of hormone in water.* So 1 ml of hormone would be mixed with 2 litres of water. Sixty millilitres of solution are applied to each plant. A breakfast cup of solution is enough for three plants or a fish tin will do seven plants. In the *Table* below the amounts of hormone for certain size containers are given.

If the hormone is applied to small plants the fruit will be below average size. To obtain a normal size fruit you must wait until the plant is about the same size as plants that normally bear large fruit under natural conditions. In a recent experiment at Keravat, it was found that hormone could be applied from about 12 months after planting without reducing fruit size, but earlier than this fruit size was reduced. In this experiment medium-sized suckers of the rough leaf Queen variety were used (see *Figure* 2). In the control treatment, no hormone was applied and the flowering occurred naturally.

It is best to apply the hormone when the nights are warm. This is because the flowers are formed naturally when the nights are cold, so there is no need to put the hormone on then. If a farmer puts the hormone on a few plants when the nights are warm, he can have fruit ripening for most of the year. If he wants a lot of fruit when no other farmer has them, he should treat a lot of plants when the nights are warm.

You can buy Phyomone from agricultural stores such as Elvee Training Company in Rabaul or New Guinea Pastoral Supplies in Lae or other retail outlets for ICI chemicals.

* 10 ppm active ingredient.

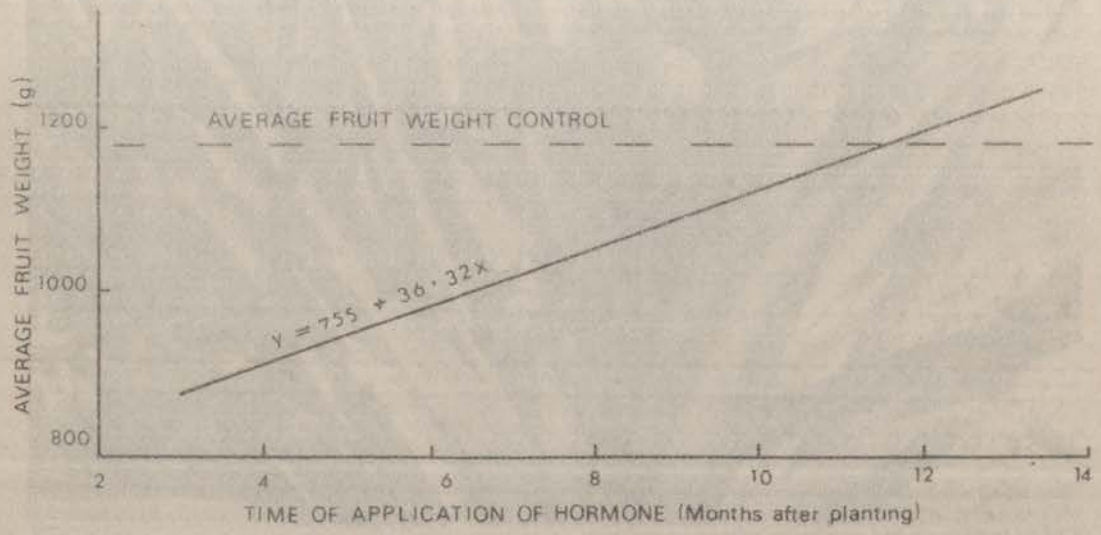


Figure 2.—Pineapple Hormone Trial, Keravat. Average fruit weight v. time of application of hormone. The later the hormone was applied, the larger was the average fruit. Plants treated 12 months after planting had an average fruit weight the same as plants that flowered naturally.

The result. A crop of fruit almost ready for harvest. If the hormone is applied when the nights are warm, fruit will be ripening when none are available from natural flowering and the farmer can sell at the higher prices. The hormone has no bad effect on the fruit.

The retail prices are as follows*—

40 oz	K6.60
8 oz	K2.10

An 8 oz bottle is enough to treat about 8 000 plants, so the treatment is very cheap. The extra money a farmer can make from selling out-of-season fruit will be many times the cost of the hormone.

Treatment will not affect the flavour of the fruit. It might make the fruit stalk a bit thinner and the fruit a bit longer and more tapering. The fruit will be small only if the hormone is applied before the plant is big enough.

Sometimes when the hormone is put on to a block of plants not all of them will flower and fruit. For the rough leaf Queen variety only about half the plants might flower. In PNG the smooth leaf Cayenne variety is much more difficult to make flower. In Queensland when the plants are growing quickly and there are problems getting the hormone to work, the plants receive two treatments of the hormone 10 to 14 days apart. This works very well in Queensland although it has not worked any better than a single application in trials by Mr Bongbong at Keravat. The same strength solution is used both times. The chemical B.O.H. (beta hydroxy ethyl hydrazine) has been found more effective than A.N.A. in Queensland when this problem occurs.

In several pineapple-growing countries it has been found that size, weight and the growing period of the fruit can be increased by putting the hormone solution on to the plants after they have flowered. This happens whether the flowers occur naturally or following hormone treatment. In an experiment in the Philippines it was found that treatment of the flowers of smooth leaf Cayenne pineapples with A.N.A. at 100 ppm eight days after flower bloom greatly increased fruit yield. As well as increasing fruit size and time to maturity this treatment is reported to make the fruit stalk stronger so that there is less chance of the fruit bending over and becoming sunburnt. A 100 ppm solution is ten times as strong as the one used to make the plants flower, so ten times as much hormone should be used for the same amount of water. This has been tried at Keravat but has not given larger fruit.

* Prices in October, 1976.

Other chemicals

As well as A.N.A. there are a number of other chemicals that can be used to make pineapples flower. These are calcium carbide, B.O.H., ethylene and Ethrel. Of these only carbide has been tried in PNG. Smoke also makes pineapples flower.

To make pineapples flower with calcium carbide, first drop a few pieces of carbide into a bucket of water. Acetylene gas is given off and some gas is dissolved in the water. When the bubbling stops, pour some of the water into the heart of the pineapple plant. The acetylene makes the plant form a flower and fruit. At Keravat this method has been found to work very well on both rough leaf and smooth leaf pineapples. Carbide is cheap but it is difficult to obtain in PNG. ICI in Lae can obtain it if requested.

Carbide can also be used by dropping a piece about 1 cm across into the heart of the plant. However we have found that this often burns the heart leaves and do not recommend it.

B.O.H. (beta hydroxy ethyl hydrazine) is another chemical that can be used. In Queensland it has been found useful when A.N.A. does not work well because of vigorous growing conditions. Shell markets B.O.H. as "Pine Set".

About 30 ml of a 2 500 ppm solution is applied to the heart of each plant. The resultant fruit are square-shouldered.

The chemical that is used to make rubber latex flow better, Ethrel, can also be used to make pineapples flower. The rate is 30 ml of a 2 000 ppm solution applied to the heart of the pineapple. Tutt Bryant at Badili in Port Moresby sells Ethrel.

Smoking plants was the first method discovered that caused flowering in pineapples. Smoky fires are lit along the edge of the field so that the smoke blows over the plants. However chemicals are much easier to use than this method.

NORTHERN PROVINCE OIL PALM DEVELOPMENT

The Commonwealth Development Corporation will invest up to K11 million in the new oil palm project at Popondetta and will be corporate manager of the scheme.

The CDC, established in 1948 in the United Kingdom, by Act of Parliament, works as a commercial organization investing its funds, drawn from the United Kingdom Exchequer, in development schemes for the promotion or expansion of economic projects which will help to increase the wealth of the host country and yield a reasonable return on the money invested.

Mr Richard Beacham has been appointed General Manager of the Estate Company, Higaturu Oil Palm Pty Ltd and Higaturu Processing Pty Ltd, the factory company.

A large 60 tonne per hour mill, designed and constructed under the direction of CDC, will be built. This factory will also provide processing and marketing facilities for smallholders.

The estate run by the Company will provide the smallholders with oil palms from the nursery and technical assistance.

A training scheme will also be started to train nationals to take over, progressively, from expatriates in technical and professional jobs.

There will be 1 400 smallholder families on the scheme.

Foreign exchange earnings from the sale of palm oil and kernels should exceed K10 million a year at full production.

WHICH SIZE TARO TO PLANT?

By R. Michael Bourke, Agronomist, Lowlands Agricultural Experiment Station, Keravat

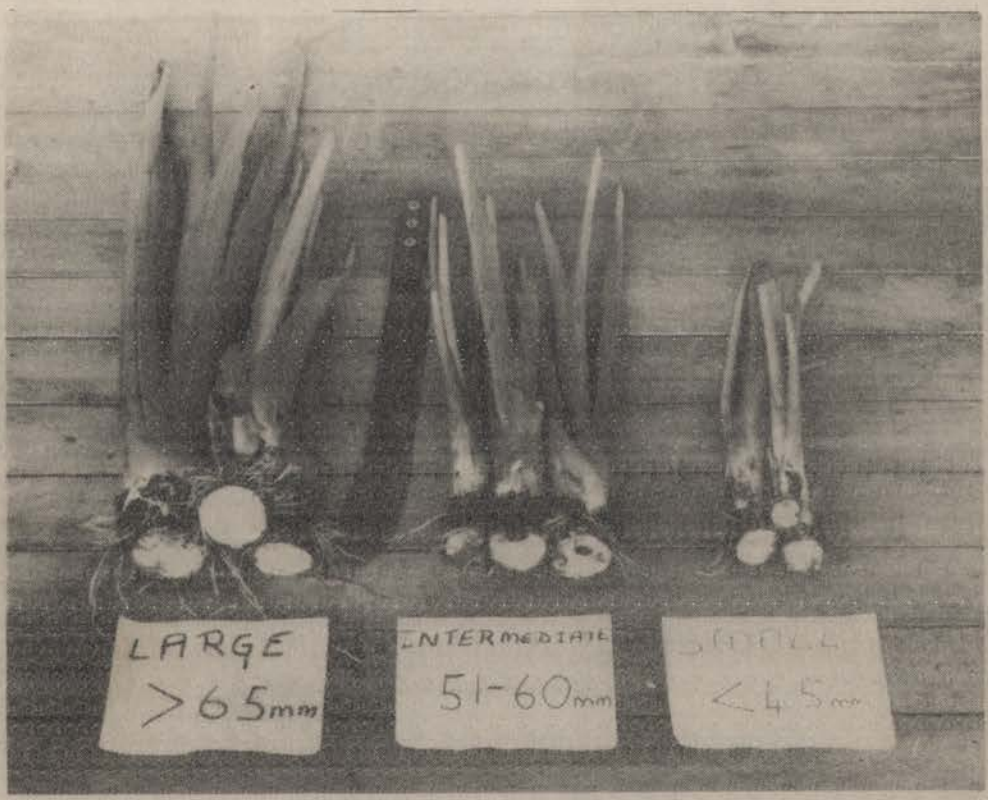
Experiments at Keravat have shown that it is better to plant pieces from larger taros, because these grow faster. They also give a bigger taro crop.

Taro is normally propagated by setts. These consist of the lower 30 to 50 cm of the petiole with the leaf blade removed together with the top centimetre or so of the corm. Four experiments at Keravat have been done to compare different sized planting material for taro. In two of the experiments, three sizes of setts were compared. These were large, medium size and small.

We found that fewer plants died using large and medium size setts. As well, average yield per plant and total crop yield were greater from large and medium size setts than from small setts. The results in the *Table* below show this.

As well as the effect on plant deaths and yield, our experiments have shown that the size of the sett affects the size of the plant. Larger setts grow faster, are taller, and have more leaves and have larger leaves. This is important because larger plants shade out the weeds better and the farmer does not have so much work weeding the taro.

The effect of sett size occurs on many taro varieties. It does not occur with one or two only.



The three sizes of taro setts used in one of the Keravat experiments. Intermediate means middle-sized.

Effect of sett size on plant death and yield.

		Large setts	*Medium size setts*	*Small setts*
No. of plants per ha that died	Trial 1	560	560	1 820
	Trial 2	1 880	2 450	3 470
Yield kg/ha	Trial 1	9 440	8 340	7 550
	Trial 2	6 080	5 650	3 860
Average corm weight g	Trial 1	790	720	660
	Trial 2	730	750	600

The experiments have shown that a farmer should plant the largest setts available. This is because large setts grow faster, shade out weeds better, fewer plants die and they give a larger yield.

Work overseas and at Keravat has shown that larger planting material is better than smaller material for a number of other crops propagated by vegetative material. These crops include Chinese taro (taro kongkong), pineapples, white potato and yams.

NEW SPC HANDBOOK—CITRUS

The latest title in the SPC Handbook series—*Citrus Production in the South Pacific*—is now available. The need for a simple, practical guide to citrus production was recommended by participants in the Technical Meeting on Tropical Fruits held in Rarotonga, Cook Islands; this handbook, compiled with the close co-operation of those technical experts who attended that meeting, is intended to fulfil that need.

Illustrated with black and white photographs, the handbook provides pertinent information on: citrus types; production of young trees; establishment, management and maintenance of a citrus orchard; major pests and their control; harvesting and preparation for market. One chapter deals with the nutritional aspect of citrus and includes a selection of simple recipes. The pomelo, a citrus now gaining popularity in some Pacific areas, is also described in an annex. Although intended mainly for small farmers, extension and agricultural officers, this handbook should also be of assistance to those people who may be interested only in planting a few citrus trees to provide an additional source of income or just provide fruit for the immediate family.

Inquiries concerning this handbook should be sent to

SPC Publications Bureau,
P.O. Box 306,
Haymarket NSW 2000,
Australia.

RED TIDE AND SHELLFISH POISONING

By J.L. Maclean

At certain times of year, shellfish around the coasts of PNG become poisonous. The poison may kill the person who eats the shellfish, or it may just make him sick.

The poison is caused by a certain kind of microscopic floating organism—a plant so tiny that most of them can be seen only with a microscope.

Normally, there are only small numbers of these organisms in the sea, and they cannot be seen, but occasionally there is a sudden increase in numbers of these organisms.

When this happens, they form a visible patch on the surface of the sea, which is usually a reddish colour, and is called "Red Tide". These patches may be up to a kilometre long and 100 metres wide.

The picture on the cover of this issue of *Harvest* shows a patch of Red Tide near Port Moresby.

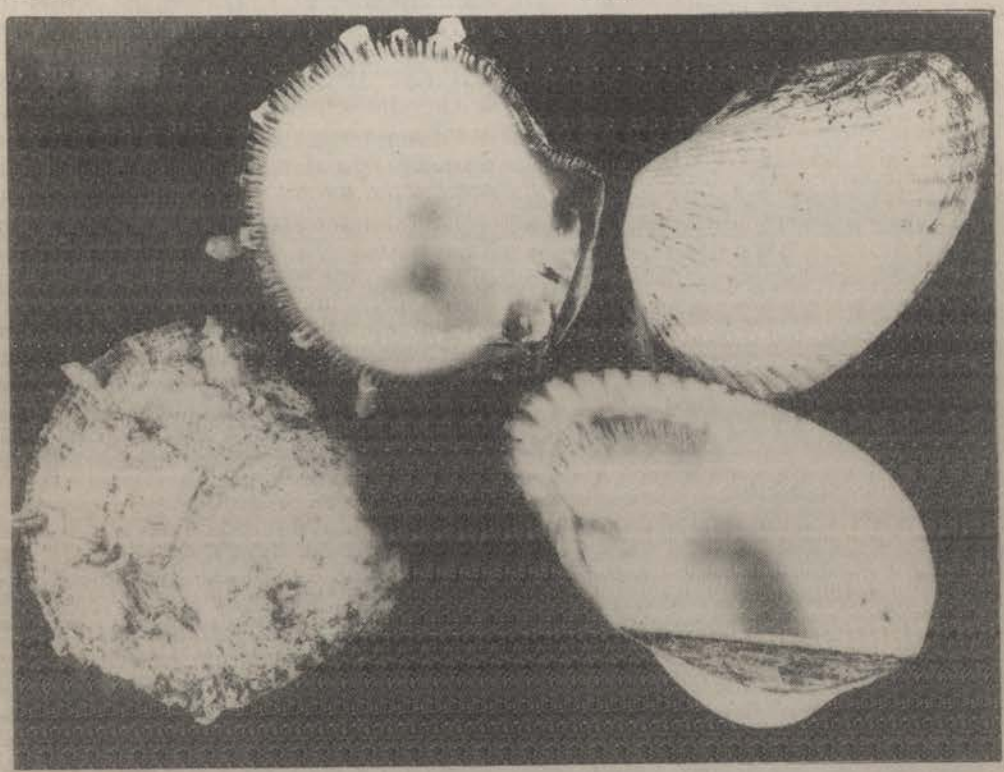
Not all the types of Red Tide are poisonous. Indeed some are quite harmless. But some Red Tides are made by poisonous species.

People never eat the Red Tide organisms directly, but some shellfish feed on the Red Tide, and then people eat the shellfish. So the poison is transferred from the Red Tide to the shellfish and from the shellfish to the person who eats it.

Only the shellfish that have two shells eat Red Tide and become poisonous. Shellfish that have two shells are known as "bivalves"; examples are oysters, mussels and clams.

Below is a list of some bivalves which are not safe to eat during Red Tide—

English name	*Motu name*
oysters	siro, batata
mussels	dihu dihu, gogodiro
jewelbox shells	sisihu
thorny oyster	sisihu
cockles	kwadi



Some of the shellfish which are harmful at the time of a poisonous Red Tide. The two shells on the left are jewelbox shells, which are called in Motu "sisihu", and on the right are cockles, called "kwadi" in Motu.

There are two factors which make these bivalves so dangerous to eat.

- Cooking the shellfish does not get rid of the poison.
- The poison stays in the shellfish for several weeks after the Red Tide has finished. It is not possible to give a definite time limit for this, but it could be as long as three months.

Symptoms of poisoning

Symptoms of poisoning appear very quickly after eating these bivalves. Within 30 minutes there is a tingling or burning of the lips, gums, tongue and face. Later this spreads to the neck, arms, fingers, legs and toes.

These parts of the body gradually become numb and later in severe cases the patient cannot move his arms or legs at all, and finally the patient may die.

A patient with these symptoms should be taken to hospital straight away. The sooner he gets to hospital, the more chance he has of getting better.

Shellfish which are safe to eat

Two types of bivalves have been found, however, which seem to be safe to eat any time. Their Motu names are "minikore" and "bogani".

Shells which have only one shell, not two, are also safe to eat. These shells are called univalves. Ordinary fish are not made poisonous by Red Tide either. The English and Motu names of some univalves are given below—

English name	*Motu name*
spider shell	raga raga
conch shell	kibi
cowrie shell	nc ne none
olive shell	digoa
volute shell	koko

Looking out for Red Tide

Airline pilots, fishermen and other people keep a lookout for Red Tide. Over the last few years, Red Tide has been reported from the Papuan coast between Port Moresby and Kapakapa and also as far east as Milne Bay.

It has been seen in the Huon Gulf near Lae, and in the Trobriand Islands, the Admiralty Islands, and West New Britain.

When Red Tides are reported, samples of the water are studied by biologists to see whether the Red Tide is poisonous. On some occasions, Red Tides have been found to be caused by harmless organisms. When a poisonous Red Tide is discovered, people in the area are warned not to eat the bivalve shellfish until the time when studies show the danger is passed.

Time of year

It now seems that poisonous Red Tides occur every year in Port Moresby harbour and eastwards along the coast during the rainy season, December to May.

On the Morobe coast, east of Lae, the Red Tide is said to be virtually an annual event in November. It is looked forward to by local villagers, who are not shellfish eaters, because the Red Tide kills large numbers of fish in many bays, and these are cooked and eaten.

But the fact that there have been few deaths in recent years means that the Red Tide may not be as poisonous in some years as in others. We don't yet know why.

Recently Red Tides have been in the news again. On 9th December, 1975, an Air Niugini pilot reported a massive outbreak in the Madang province, "stretching from the southern edge of Karkar Island across the Vitiaz Straits to Cape Croisilles and eastward to, encircling Bagabag Island". The next day it was east of Madang, covering some 180 square kilometres.

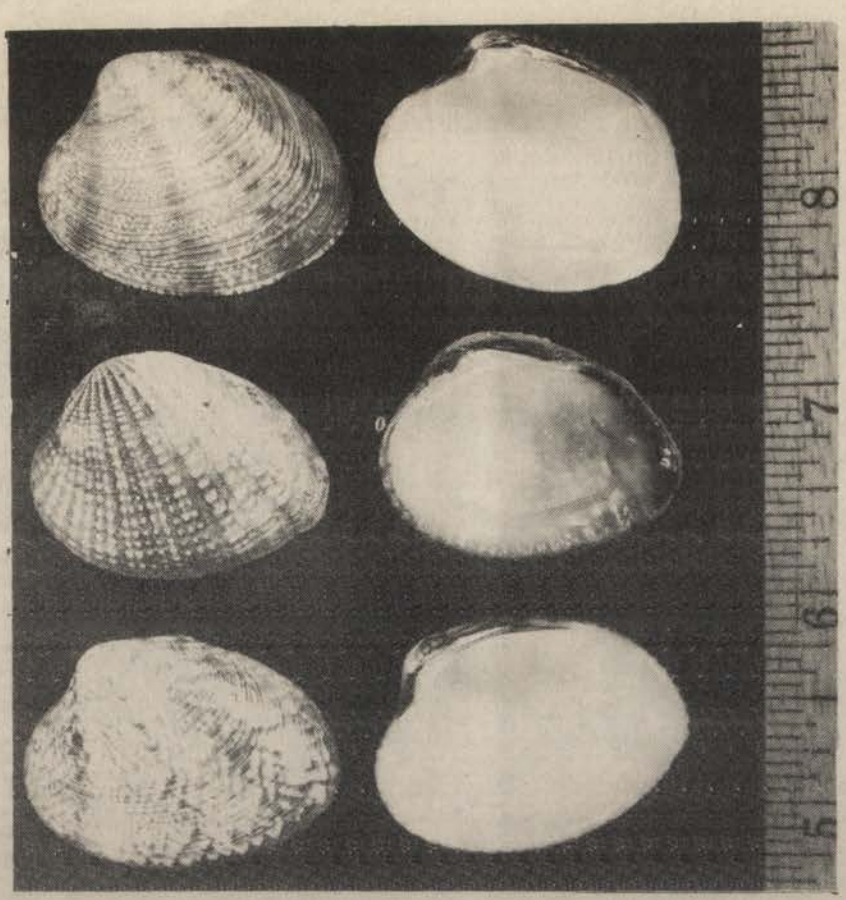
A sample was sent to me in Canberra. It proved to be a harmless Red Tide, common in open ocean waters.

However, a week earlier two people in the Talasea area were said to have been killed by eating fish which were affected by Red Tide there. Thirty other persons were treated for poisoning at the time. Deaths from eating bivalve shellfish have occurred near Talasea before—three persons in 1961 and one in 1963. It is not known whether the deaths in December, 1975 were from fish or shellfish, but it seems more probable that bivalve shellfish were the culprits.

Notifying Red Tide sightings

Since there is no easy way to distinguish between poisonous Red Tides and harmless ones, it is desirable that all Red Tides be investigated. Officers from the Department of Primary Industry will be glad to come and take samples of any Red Tide they hear about.

Marine biologists will make a microscopic examination of the water and will then be able to advise whether it is poisonous or not. All appearances of Red Tide should therefore be



As far as we know, these are the only bivalves which are safe to eat, at a time of poisonous Red Tide. The two shells in the centre are called in Motu "minikore" while those at the top and bottom are called "bogani".

reported to—

Officer-in-charge
Kanudi Fisheries Research Station
Department of Primary Industry
P.O. Box 2417
Konedobu
Telephone Port Moresby 259522 or 259995

Is Red Tide spreading?

The poisonous Red Tide which is now found in Papua New Guinea was previously never known to occur in this part of the Pacific Ocean, only on the eastern shores of the Pacific in the tropical American continent.

In March and April, 1976, an outbreak of this Red Tide was reported for the first time in Malaysia and there are reports of deaths from eating bivalve shellfish.

Is it possible this Red Tide is spreading?

Further information

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Mr Maclean was formerly a fisheries biologist at Kanudi Fisheries Research Station. He is now with the Fisheries Division of the Department of Primary Industry, Canberra, Australia.

WOMEN IN AGRICULTURE

By Rosa Kambuou, Experimentalist, Agriculture Research Centre, Bubia

Rosa Kambuou explains her soya bean trials to visitors at the Field Day held at Bubia in November, 1976.

Training women in agriculture

Many people, particularly our nationals, think that training women in fields like engineering, architecture and agriculture is a waste of time and money. They regard these professional jobs as men's exclusively.

Women are quite capable of handling these jobs, but they were never given the chance in the past. The author feels strongly that our national women who are interested in agriculture should be given the training and as much help as possible.

Traditionally, agriculture is women's work. Women prepare the land, plant and harvest the crops, while men are traditionally hunters, fishers and fighters (warriors).

Women were the outstanding figures in traditional agriculture, but this was forgotten when the western education system was introduced.

Training women in agriculture is certainly important for any agricultural developing country like Papua New Guinea. Therefore, provision should be made to take in women students at the various agriculture institutions and colleges throughout the country. It is encouraging to know that our government has recognized this by taking women into Vudal and Popondetta Agricultural Colleges. Next year women will also attend at Highlands Agricultural College.

The training programme for women agriculturalists should not be based on agricultural subjects only. It is obvious that most of our young emerging agriculturalists (whether male or female) will be going into rural areas on completion of their courses. These people should know the ideas on handling, and perhaps solving, the problems that are faced by our rural communities, not only in agriculture but also in fields of health and community development.

Role of women field workers

There are numerous jobs women can do as field workers.

(1) They could join the research stations, as research workers, or perform an assisting role in any research programme. If our national men can do the job there is no reason why our women can't.

(2) Women can do just as well in field work as men. They can either perform a role of rural development officer or act as government liaison workers between the Department and the local farmers. Patience, gentleness and friendliness are the key points to remember when dealing directly with the rural people. It is likely that women possess all three qualities and this will enable them to communicate and contact the rural people more easily and successfully.

(3) Participation of women in agriculture, particularly in field work, will encourage more women to go into agriculturally oriented businesses.

(4) Most of our rural women concentrate mainly on subsistence gardening to produce enough for their families and for selling at the local markets. Women field workers can aid these women to make larger village gardens for community consumption. Field workers can also assist women's organizations in the villages, like the women's club, to make community gardens and arrange for the markets for selling the products. The income from these products can be put into the village fund for the community use. This of course fulfills the idea of self-reliance, one of the aims of our government's Eight Point Plan.

(5) Nutrition status of the villages as we know is sometimes very poor. There are various ways of solving these problems. One way is for the nutrition officers to talk to the people.

However, the villagers will understand if they see the various sources from which the nutrients are derived and the ways of producing nutritive food. Women field workers then have a role to play and this is to encourage the village women to grow crops that are nutritionally important. Since garden making and meal preparation in rural areas is performed by women, it will be a successful mission if women field workers are involved in the rural nutrition advisory work more than their male counterparts.

Problems likely to face women field workers

Women in any field of work face all sorts of problems, both big and small. Field work is pretty hard and often very difficult for a woman to handle. Here women are dealing with men from the village, especially in research work where all the labourers employed are male. It is tough and at times very difficult for a woman field worker to tell or give orders to middle-aged men who were never ordered by women before, especially when our country has been male dominated all along.

Women doing extension work are likely to face similar problems. They are likely to face the situation where the village men refuse to listen to them because they are women. There is no evidence reported of this problem. However, it is a likely problem in the future.

PNG MAKES OWN PEANUT BUTTER

The Minister for Finance, Mr Julius Chan, officially opened Papua New Guinea's first peanut butter factory on Saturday, 6th November.

The opening was witnessed by 1 000 people from the Markham Valley area of the Morobe Province.

The technology used at the new peanut butter factory was "quite simple and appropriate to a village situation", he said.

"Atzera is an example that other rural groups might do well to follow. It is an excellent example of self-reliance, decentralization, rural development and processing in Papua New Guinea—in fact, it fits the government's eight point plan in many ways", Mr Chan said.

The peanut butter factory is owned by Atzera Rural Co-operative Limited and is the first factory to be built in the country.

The factory will provide peanut paste for the whole country. It cost more than K31 000 to build.

The factory was built from a government grant of K12 549 and a Papua New Guinea Development Bank loan of K14 000.

EAST NEW BRITAIN PROVINCE

By Fred Embi, Provincial Rural Development Officer

The overall climate in the area is typical of the New Guinea islands region, with north-west monsoon and south-east trades. The north-west monsoon season is between December and March, bringing rain and humidity. The south-east trades season is generally drier and occurs between May and October.

The average maximum temperature is 32°C and the average minimum is 23°C. The annual rainfall averages 2 234 mm, with an average number of wet days of 188.

Fred Embi

Fred Embi was appointed Provincial Rural Development Officer for the East New Britain Province in March, 1974. He has been with the Department of Primary Industry for about six years. He was born at Beporo in the Northern Province, educated at the Anglican Mission primary school and at the Matyrs' High School, and went to Vudal Agricultural College between 1968 and 1970. His first posting was to Laiagam, where he spent two years, then to Mendi for one year, where he became an associate PRDO, and was acting PRDO for a time, before his permanent appointment as PRDO Rabaul. Mr Embi is married with one son. His wife Notburga works as a sister at Nonga Hospital.

The total area of the province is 15 994 km^2. The area is generally mountainous. On the northern side are a few patches of flat swampy area covered by pitpit. The southern side is mountainous with deep valleys making cultivation difficult.

In the Gazelle Peninsula the soil is volcanic pumice with 10 cm of topsoil of a clayloam type. In the Baining area and towards the western border the soils are typical black soil ranging from 15 to 30 cm in some areas.

The vegetation is rainforest throughout the province with patches of flat pitpit swamp on the northern slopes and kunai patches on the southern side.

In the Gazelle Peninsula almost every bit of available land is cultivated for cash crops or subsistence gardening. There is a high population growth rate in this area. Mountain slopes and valleys are cultivated marginally.

In the Baining area and Pomio district the terrain is very rugged and difficult to cultivate especially in the Pomio area. With a smaller population in this area mountain slopes and valleys are rarely touched.

The Gazelle Peninsula is well covered by good road systems. The Pomio district is all mountainous and because there is less development in the area there are no road systems. On the northern side where logging activities are going on the logging company is building roads mainly for logging purposes.

There are five airstrips in the Rabaul district and three in the Pomio district. The area is well served by light aircraft. In the Rabaul area Powell Harbour is serviced by light aircraft twice daily, and Pomio strip has flights three days a week.

There is a good telephone system in the Gazelle Peninsula. Radios are installed at all outstations.

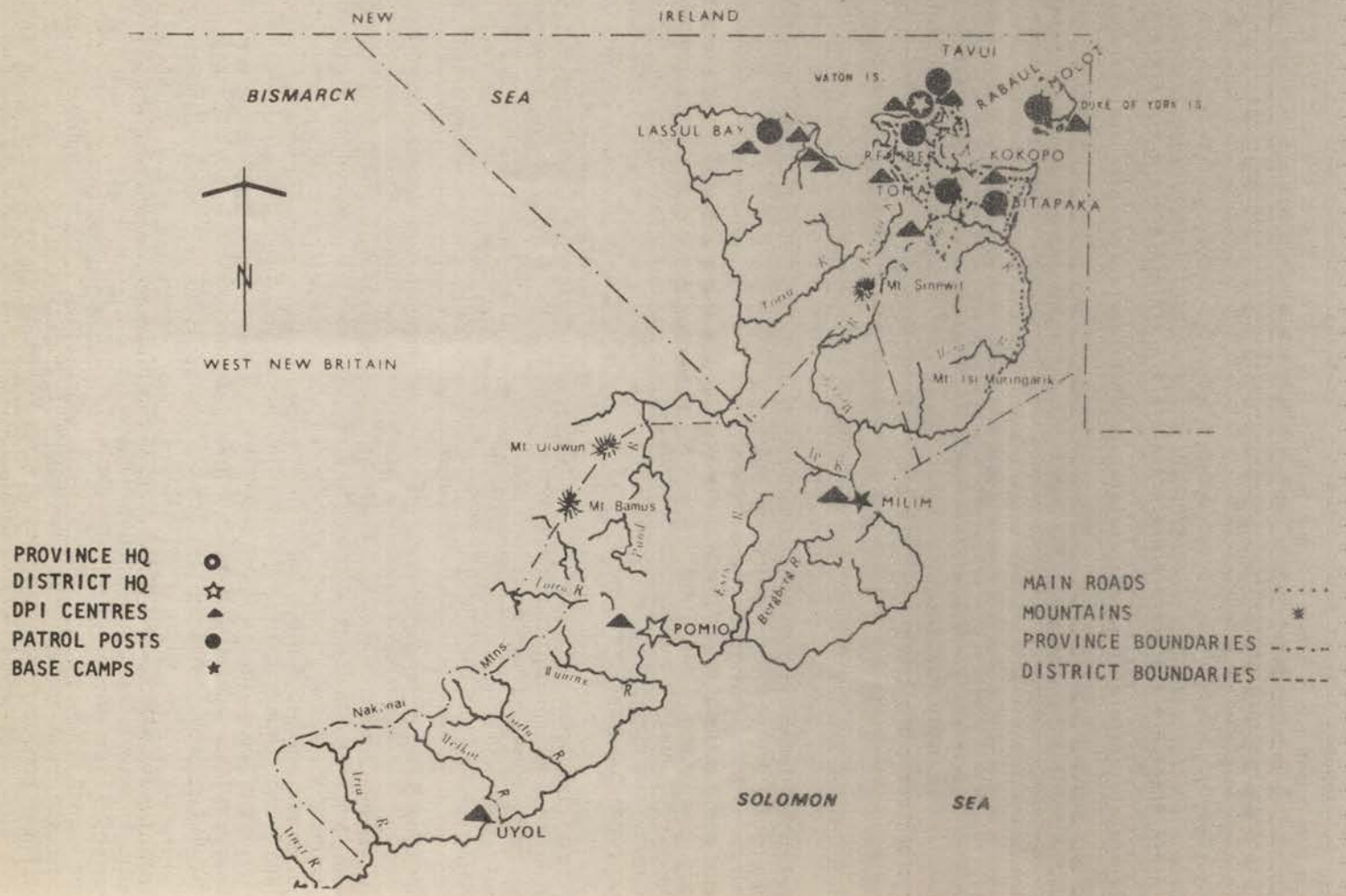
Transport is adequate in the province.

People

The population is estimated at 100 000. The total potential agricultural workforce, men and women, is estimated at 44 660.

The province is generally well served by government and mission hospitals, health centres and aidposts.

EAST NEW BRITAIN PROVINCE



The level of education is very high especially in the Gazelle Peninsula. The province has over 22 000 students at 102 community schools, 8 high schools, 3 teachers' colleges, 2 technical colleges and 5 vocational centres. The national diploma level agricultural college was established at Vudal in 1965. It caters for students from other South Pacific countries as well as Papua New Guinea.

There are 12 main language groups in the province. These are Kuanua, Baining, Butam, Makolkol, Nakanai, Mengen, Kol, So, Tomoip, Sulka, Mamusi and Mioko.

Most land disputes have been over alienated land and these have been influenced by political movements. With the government land acquisition scheme the problem has become better but there are still a few groups disputing over land.

There are five churches represented in the province. The Catholic and United Churches are the main influences and take part in agricultural activities and education.

There are about 30 self-help groups. The main ones are Tavakikil Group, the To Wartovo and To Waninara Groups, all farmers and traders, the Walmatki Group and the Poiniara Group, both cocoa processing groups, and the Ulagunan Correspondence School.

Political

There are four councils: the Gazelle Trust (tax rate men K4, women 50 t), the Greater Toma Council (men K16, women K4), the Lassul Bay Council (men K8, women K2), and the Warkurai Nigunan (men K5, women 50 t).

The three main political groups are the Warkurai Nigunan (Mataungans), the Warbete Kivung and the Greater Toma Council.

There are no local government council agricultural committees at present.

Members of the national parliament are: regional member, Damien Kereku; Rabaul, John Kaputin; Gazelle, Martin To Vadek; Kokopo, Oscar Tammur; and Pomio, Koriam Urekit. All participate in agricultural development.

Provincial Government was established in June, 1976.

Economy

The main crops are cocoa and coconuts. There are 150 plantations in the province. Approximately 80 % of the plantations are interplanted with cocoa and coconuts. Plantations and missions run cattle, and there are two Papua New Guinean owned cattle projects.

There is one Department of Primary Industry research station, the Lowlands Agricultural Experiment Station at Keravat. Kurukakaul Livestock Station near Rabaul was used for breeding and distribution of livestock. However, Vudal Agricultural College has taken over breeding and Kurukakaul is now a holding and transit station for stock from Vudal.

There is a cordial factory and a copra oil factory.

There is a main Savings and Loan Societies office in Rabaul, and eight small sub-branches in the Gazelle Peninsula. Members obtain loans to buy PMVs, trucks etc. Pomio district has no Savings and Loan Society facilities.

Due to a shortage of land, there are no land rationalization schemes. There are five main land settlement schemes, Sunam, Keravat, Warangoi, Illugi and Vunapaladik. The Department of Natural Resources is helping people to purchase expatriate plantations. The government then hands the plantation, which was originally under traditional ownership, back to the people.

AGRICULTURAL DEVELOPMENT PROGRAMME

Cocoa

There are 12 300 ha of village plantings, and 32 800 ha of plantation cocoa. Annual production is 7 000 tonnes from village plantings, and 17 000 tonnes from plantations.

Cocoa cuttings from dieback-resistant clones are being distributed to village farmers. Approximately 60 000 cuttings were distributed between May, 1974 and July, 1975. The supply of clonal cuttings has not been sufficient to cope with demand.

The present programme is to replant unproductive areas with more die-back resistant cocoa cuttings; to increase plantings in the Wide Bay and Baining areas when road

Member of the Cocoa Industry Board and president of the Gazelle Trust, Tuit Tomarum (centre) with PRDO Fred Embi (left) and a cocoa farmer, inspecting cocoa beans at the Davaon Fermentary. (Photo by M. H. M. Belfield)

access becomes available; to upgrade management practices and to improve processing facilities.

This programme will extend over the next two years.

In 1978-79 processing facilities will be constructed in the Wide Bay and Baining area.

Coconuts

Village plantings of coconuts are about 32 400 ha and plantations are 40 500 ha. The annual production is 9 000 tonnes of village copra and 27 000 tonnes of plantation copra.

Approximately 80 % of plantations are interplanted with cocoa.

Coconut Products Limited has a copra oil factory in Rabaul.

Land shortage, political pressures, cult activities and transport problems all place some obstacles to development of this crop.

In 1976-77 an increase of plantings by 5 % is planned in outlying areas as road access becomes available.

An increase of production of 10 % will be achieved by improving managerial practices. Improved quality will be achieved by improving processing, transport and storage facilities.

This programme will be continued in 1977-78.

Coffee

There are only about 3.6 ha of coffee. People are becoming increasingly interested in coffee due to present high prices although there are still marketing problems.

Existing plantings will be maintained, and plantings will be increased by 5 % in 1976-77 when the road over the Warangoi River is completed.

The Department will assist in marketing of parchment beans.

Rice

There is one rice project at Ulagunan vocational centre and various trial plots in the villages.

Trial plots will be established for interested farmers, and the Department will assist in processing facilities. The main aim is to

encourage rice as a subsistence crop, not for cash.

Pepper

There are only 4 ha planted, with a production of about 150 kg.

Pepper is more or less treated as a sideline crop or hobby and is usually tended by old men and women.

The 1976-77 aim is to increase plantings by 20 % and increase production by 30 %.

Other suitable spice crops may be introduced on the recommendation of the research stations.

Fresh food sales and subsistence

Supply of fresh foods in this province is abundant, with sales through local markets meeting the demand.

A freezer and storage unit have been installed in Rabaul.

A Departmental officer will maintain contact with subsistence farmers particularly in adverse conditions to ensure that any shortage is avoided. He will encourage subsistence farmers to sell their surplus to main centres, government institutions, etc.

Imported food will be replaced where possible.

Fruits and vegetables will be sent to other centres for sale as charter backloads.

Cattle

There are two cattle projects with 31 head. Plantations and missions run cattle under coconuts, with a total of about 1 600 head.

There are about 300 to 400 wild buffaloes on a mission plantation in the upper Wide Bay area. These buffaloes are being brought under control.

There are also about 20 head of wild buffalo in the Bainings area, but they are being eradicated.

The Department assists with repair and maintenance of yards and crushes on smallholder projects.

In 1976-77, eight to ten new cattle projects will be established. Land disputes may restrict

Weighing cocoa beans at the Davaon Fermentary. The fermentary is owned and run by New Guinea Islands Produce Co. Ltd. (Photo by M. H. M. Belfield)

this programme.

Tuberculosis and brucellosis testing of all animals is being carried out, and will be completed in 1976-77.

A buffalo fly eradication programme will be carried out in 1976-77.

In 1978-79, when road access to the Bainings area is completed, five projects will be established in this area.

Pigs

Pigs are run in the villages. There are seven pig fattening projects near the Rabaul town area, but expansion is slow due to lack of weaners.

In 1976-77 the number of projects will be increased to 15, if enough weaners are available.

Management practices will be upgraded and improved. Regular veterinary services will be maintained.

Poultry

There are five poultry projects around Rabaul. A large number of birds are run in villages.

The poultry projects will be increased in conjunction with the pig projects. Management practices will be upgraded and improved. Regular veterinary services will be maintained.

Possible retrictions to this programme may be a shortage of day-old chickens, and the cost of feed.

Wildlife

A wildlife reserve for megapodes is being set up in the Matupit area.

The Warangoi people are being encouraged to set up a wildlife committee.

Interested persons will be encouraged to start crocodile farms.

Fisheries

There are ten existing fishing groups. The province has an ice-making machine, and a 10 tonne freezer in Rabaul.

Department of Primary Industry staff are attending fisheries training courses at Madang.

In 1976-77 the number of fishing groups will be increased from three to ten.

The Department will improve fishing methods of fishermen, will continue maintenance of nets and equipment, demonstrate fishing techniques etc. We will continue supply of ice and encourage fishermen to buy ice boxes.

Fish inspection is carried out on foreign fishing vessels.

Produce inspection

Rabaul is the main centre for produce inspection. Over 16 100 tonnes of copra and 34 800 tonnes of cocoa are handled annually. Inspectors are sent out from here to all centres of Papua New Guinea. A new inspection office and depot have been completed, and staff training is being improved.

GOVERNMENT TO RUN GARAINA TEA PLANTATION AS A BUSINESS

The Minister for Primary Industry, Mr Boyamo Sali, announced in October that the Government plans to operate the tea plantation and factory at Garaina in the Morobe Province as a business venture over the next two years.

The tea plantation was established in the late 1940s as a nursery to provide tea seedlings for planting in the highlands provinces as well as to see if Garaina area was suitable for tea-growing.

Mr Sali said although some people expressed their desire to buy the plantation, the Government wanted to operate it as a business venture first so that if it proved profitable the Government would sell it to the people.

If not, there would be no alternative but to close it down.

Mr Sali said the plantation was very expensive to maintain compared to the highlands area because of air freight and road transportation costs.

He said expenditure on the plantation over the past two years amounted to about K140 000.

WEST NEW BRITAIN PROVINCE

By Lamalua Makara, Provincial Rural Development Officer

West New Britain is subject to two seasons, the north-west and the south-east seasons. The north-west season lasts from October to May and is the wet season for the north coast. The south-east season lasts from May to October and is the wet season for the south coast..

The average rainfall on the north coast is 3 560 mm and on the south coast 7 600 mm.

Lamalua Makara

Lamalua Makara has been Provincial Rural Development Officer of the West New Britain Province for two years. His home area is Aroma in the Central Province. Mr Makara did his primary schooling at Aroma, then went to Iarowari Intermediate School, and Sogeri Senior High School, in the Central Province. He attended Popondetta Agricultural Training Institute (now Popondetta Agricultural College) and then Vudal Agricultural College. His first posting with the Department was to Cape Rodney in his home area. He moved around in the Central Province, to Rigo and Magarida, and then went to Port Moresby for one year for further training. The next posting was to Alotau for one year, then back to the Central Province for another ten months for special rice work at Bereina. From Bereina he came to the West New Britain Province in April, 1974 to take over the job of PRDO. Mr Makara is married with three children. His wife Ava works forthe Health Department, as a maternal and child health sister.

West New Britain comprises the western section of the island of New Britain, from Open Bay on the north coast and from Montague Harbour on the south coast.

The intermediate boundary is the main spine of the Nakanai Ranges, to the headwaters of the Wain River.

The coastal strip between Open Bay and the Willaumez Peninsula is a gently sloping coastal plain of volcanic origin.

The southern slopes generally consist of broken limestone ridge country.

The north-western areas tend to be swampy, except around Gloucester area where volcanic soils are found. There are numerous relatively short rivers, flowing from the central range to the north and south coasts.

The whole of the centre of the island is rugged and virtually uninhabited. The main range is the Whiteman Range.

On the north coast the soils are generally of volcanic origin and quite fertile, especially the area extending from the Willaumez Peninsula to Open Bay.

On the south coast the soils are mainly of limestone origin and less fertile than those on the north coast.

The vegetation in the lowlands is tropical rainforest.

The total area of the province is 20 486 km^2. The area of arable land is 2 345 km^2, with 3 387 km^2 of marginal land. About one-fifth of the arable land is being used.

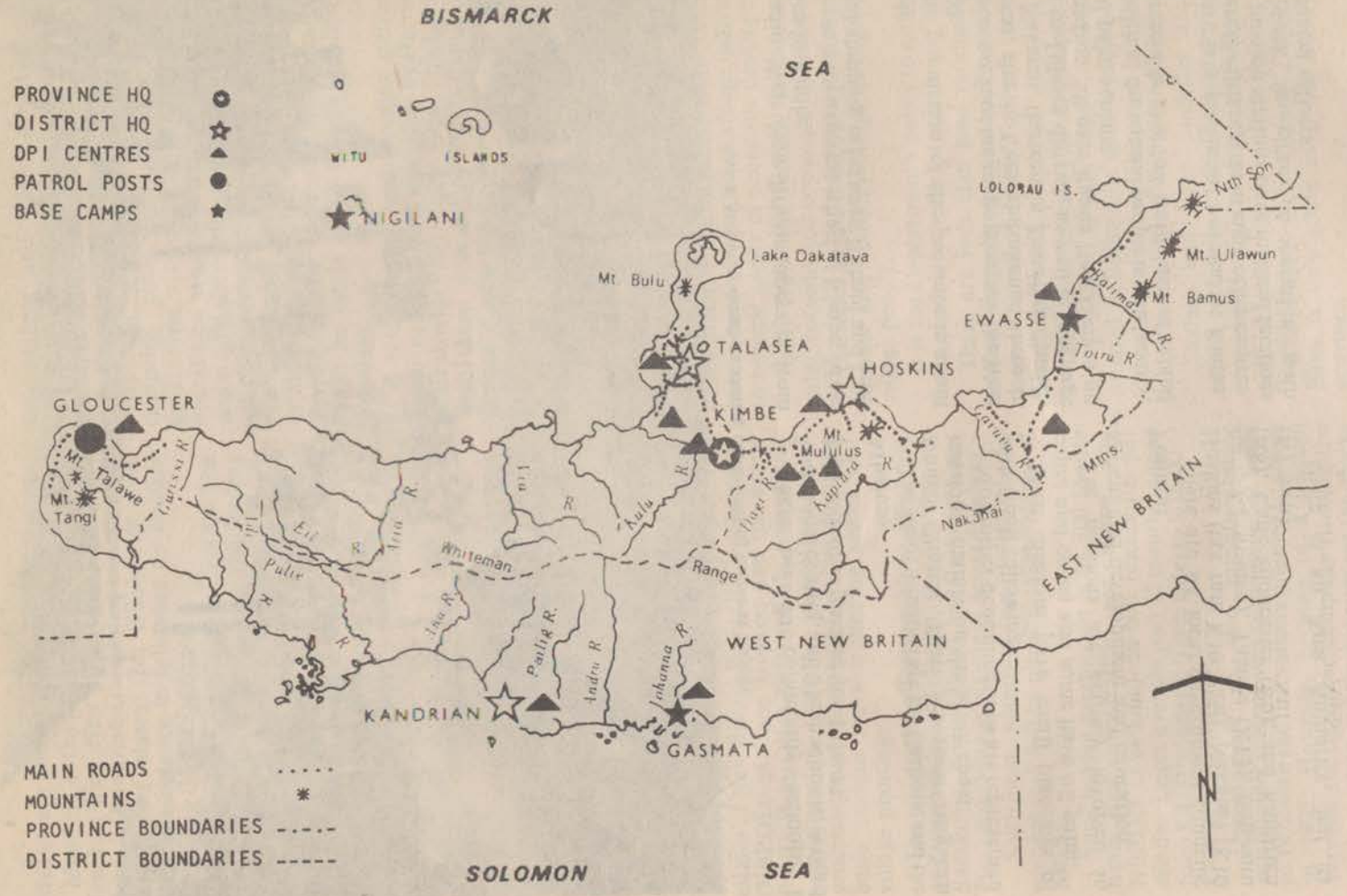
There are 400 km of roads in the Talasea to Hoskins area. The Kimbe to Hoskins road is sealed. There are 96 km of road serving the Hoskins oil palm land settlement scheme.

Roads have been constructed in the Passismanua and Gimi and Rauto areas ofthe Kandrian district, using Rural Improvement Programme funds.

Hoskins is the main airport and there are nine other airstrips.

Kimbe is connected to STD and ISD telephone services. Government stations and most plantations in the Kimbe, Talasea and Hoskins area are connected to the VHF telephone service. Outstations are connected by radio.

WEST NEW BRITAIN PROVINCE



Area Authority members visiting cattle-holding centre at Kapore.

Radio West New Britain operates from studios in Kimbe.

There is an overseas wharf at Kimbe. Most coastal shipping is between Rabaul and Lae.

People

The population of the province is about 71 500.

There are four language groups in the West Nakanai, five in Central Nakanai, three in East Nakanai, thirteen in Kandrian district, seven in Talasea district, as well as language groups from all over Papua New Guinea on the oil palm scheme.

Health of the coastal people is satisfactory, but protein level is low in the diet of inland people.

There is a provincial hospital at Kimbe, and rural health centres at eight other centres. Most mission stations have medical facilities and work in close co-operation with government officers.

There are 59 community schools, 2 vocational centres, and 2 high schools. A third high school is planned for 1976-77.

Missions

The main missions are the Catholic and the United Church. There are some Anglican missions, mainly on the south coast.

Most other denominations are represented with small followings.

Most missions have small plantings of copra and cocoa and some have oil palm.

The missions are actively involved in agricultural development and education.

Political

There are six local government councils: Hoskins (tax rate K10 men), Nakanai (K10 men, K2 women), Talasea (K13), Bali-witu (K8), Cape Gloucester (K6), and Kandrian (K7 men).

There is an Area Authority, but its

activities are limited at this stage.

Members of the national parliament are J. Maneke (West New Britain Regional), G. Masa (Kandrian-Gloucester) and H. Humphries (Talasea). Mr Humphries gives valuable assistance in following up matters concerning the local farmer.

Other notable community leaders are Soa Ukia of Uasilau, a clan leader and leading businessman in his area, Simogun Peter, a leader from the Sepik of the Dagua people at Kapore, and Tangoli Nuli of Woganakai village. Mention should also be made of leaders Napasisio, Sokinga Komaro, Kulo Agorang Pro, Ande Kalu, Boas Galia, Rapa Keta and Mataime.

Economy

There are no major land disputes. However, in the Bola area of the Talasea district, many disputes over fishing rights are hindering development.

Oil palm development

Oil palm is the most important cash crop in the West New Britain Province. The smallholder oil palm is financed by the World Bank and regarded as a national project. The estates of New Britain Palm Oil Development (NBPOD) at Cape Hoskins and the Trans Pacific Palm Oil (TPPO) at Biala, comprising administration, estate plantations and processing and marketing facilities, form the basic nucleus for surrounding settler and village plantings.

The main palm oil settlement plantings are at Kavagara (near Talasea), Kapore, Tamba, Sarakolok, Buvusi, Galai, and Kavui (at Cape Hoskins). Village plantings are at Hoskins.

Settlement plantings on 1 560 blocks amount to 5 800 ha plus 200 village blocks of 640 ha.

Smallholder production is 98 700 tonnes fresh fruit bunch (ffb) per annum; and NBPOD (2 800 ha) 50 000 tonnes ffb per annum. Prices over the past 12 months ranged from K8.00/tonne ffb (farm gate) to K16.00—average of K13/tonne.

Development of the nucleus estate smallholder scheme was commenced at Biala in 1972 with the first settlers planned to arrive in 1975. However, because of a dispute between the Japanese company running the nucleus estate and the government the blocks were not allocated. Despite the dispute infrastructure development has continued. Sali Malase and Tiaru subdivisions of approximately 300 blocks are now ready for settlers. Wilelo development is well advanced and the new Biala town is substantially completed. As the dispute with the Japanese company could not be resolved the government acquired the estate and is now operating it as a government-owned company and is now attempting to interest experienced oil palm companies in the project. When a new agreement is reached for the nucleus estate it is anticipated that the scheme will develop rapidly and realize the potential of 2 000 ha estate and 4 000 ha smallholder plantings.

A research and seed-breeding station at Dami (near Hoskins) was set up by Harrisons & Crosfield (PNG) Ltd in 1968. This has now been taken over by NBPOD. Papua New Guinea is now not only self-sufficient in oil palm seed but can export.

By 1981 total production for West New Britain could be 280 000 tonnes.

Other development

Generally in the past, West New Britain people have not been very enthusiastic about economic development. However, since the development of the oil palm scheme, there has been a tendency for a few village individuals to become aware of economic development.

Apart from the recently introduced oil palm, coconut and cocoa are the main crops.

The main agricultural policy is to increase coconut and cocoa plantings as required by village people.

It is the Department's policy to establish a fishing industry in the province.

There are four clan land rationalization schemes in the Hoskins area, for coconut and cocoa. There is one in the Gasmata area of the Kandrian district.

The timber industry is very important in the province. Stettin Bay Lumber Co., situated at Buluma, is quite a large concern. Other sawmills are situated at Bakada, Ulumona and Biala on the north coast.

Savings and Loan Societies are quite active, especially in the Talasea to Hoskins area and most particularly in the Hoskins oil palm scheme.

The Papua New Guinea Development Bank is very active in giving loans in the province.

There are ten Producers' Co-operative Societies. Seven of these co-operatives also

Area Authority members visiting fishery establishment at Kimbe.

conduct retail activities.

A Co-operative Wholesale Society is established in Kimbe and will shortly be opening a branch store at Biala.

Numerous groups have been formed to establish village trade stores, to purchase vehicles and to operate PMVs. The Bali-witu, though being somewhat isolated, have developed a sense of self-help in forming copra groups for marketing of copra etc.

AGRICULTURAL DEVELOPMENT PROGRAMME

Coconuts

There are about 10 000 ha of village coconuts, with a production of 4 500 tonnes per annum. There are 23 plantation producing both copra and cocoa. Production of copra from plantations is approximately 10 000 tonnes.

The interest of the people in coconut planting is generally low. Transport to Kimbe is one of the problems.

Harrisons & Crosfield operate the Copra Marketing Board agency in Kimbe. Village growers can either market their produce directly to the Copra Marketing Board, or through traders or growers' co-operative societies.

A continued increase in plantings is planned: 110 ha in 1976-77, 200 ha in 1977-78, 260 ha in 1978-79 and 280 ha in 1979-80.

Production will be increased by 105 tonnes in the coming year and is expected to reach 10 000 tonnes (from village plantings) by 1981. A possible restriction to this is that expected low prices may discourage production.

Twenty-seven copra driers will be erected in 1976-77: 7 at Hoskins, 6 at Talasea, 10 at Kandrian, 3 at Ewasse and 1 at Salelubu.

Fifteen driers will be erected the following year, and 30 in 1978-79.

Investigations will be carried out into the possibility of using a new plastic drier design, in 1977-78.

The Department will liaise with other departments, banks, suppliers and councils to solve the problems with supply of construction materials.

A pest control programme is being carried out with the assistance of the Lowlands Agricultural Experiment Station at Keravat in East New Britain.

The Department will assist with solving marketing and transport problems. In 1976-77 we will co-ordinate ships to carry copra from villages at Kimbe. If possible, the Department will buy copra where no other buying service is available.

The following year a survey will be carried out on the possibility of councils buying a boat for copra shipment.

Private buyers will be encouraged to buy copra from village people, in a programme planned for 1978-79.

Cocoa

There are about 1 155 ha of village cocoa, producing 350 tonnes per annum. Approximately 200 ha are immature.

Plantation production is 1 000 tonnes per annum.

Cocoa has great potential in the province. It is grown mainly in the Nakanai area and the Bola area of Talasea district.

It is planned to increase village plantings by 200 ha by 1981. The main increases will be Kandrian (90 ha) and Biala (40).

Total smallholder annual production for the province should be 500 tonnes dry beans by 1982.

In 1976-77 cocoa nurseries will be established at Talasea, Kandrian and Hoskins.

Cocoa processing facilities will be improved at Talasea in 1976-78. Processing facilities will be established at Hoskins in 1979-80 and a drier will be erected for the Ubili and Modu area. Two more driers will be erected at Biala in 1980-81.

A shortage of clonal cocoa cuttings from Keravat may hinder the planting programme. If there is lack of interest at Talasea the expected planting may not be achieved.

Subsistence

This programme aims to ensure that village people have enough food at all times. It was found that there is an abundance of taro, sweet potato, corn, greens, nuts, peanuts etc. A substantial amount of root crops, peanuts etc. are available in local markets on Saturdays. This activity plays an important role in providing food for people.

Rice will be introduced to Gasmata and Gloucester areas in 1976-77, for family consumption only.

There have been no results from a sugar-cane trial at Gloucester and Hoskins. This trial will be maintained in 1976-77. Sugar will also be promoted as a subsistence crop only.

In 1976-77 vegetable seed will be made available to oil palm settlers as well as to villagers. Vegetable growing will be encouraged at community schools.

Farmers will be assisted to market sago.

Further betel nut growing for cash will be encouraged.

Replacement of imported foods by locally grown crops is aimed at.

Market facilities will be provided in areas where they are needed in 1978-79.

In 1979-80 a survey is plannedto determine alternative uses for food crops should the production exceed local demand.

Cattle

There are three smallholder cattle projects at Talasea and three at Hoskins. There are 108 head on these projects.

There are 420 head on expatriate plantations.

Cattle is a new activity. Gloucester council is setting up a demonstration project. A cattle holding paddock and slaughtering facilities will be established at Kapore and Nahavio. This will accelerate the development of the cattle industry.

The cattle holding paddock at Kapore will be stocked in 1977-78.

In 1976-77 three new projects will be established at Hoskins and one at Talasea. Two more projects will be investigated, one at Kandrian and one at Hoskins.

One hundred ha of improved pasture will be established on projects at Hoskins, Gloucester and Talasea.

The cattle population in the Hoskins and Talasea area will increase each year to an estimated 3 000 head by 1981.

In 1976-77 the Area Authority will establish slaughtering facilites at Nahavio. The Department will negotiate the possibility of setting up a large-scale cattle project.

It is expected that the province's beef requirements will be supplied locally by 1978.

Pigs and poultry

There are two pigs projects financed by the Development Bank at Biala, with ten pigs.

There are about 120 pigs owned by plantations etc., 20 by vocational centres and 15 by societies.

Pigs and poultry are not commercially successful.

Good pig and poultry stock will be introduced to villages.

In 1979-80 20 weaners will be supplied to settlers at Biala.

Fishing

People from Hoskins, Kombes, Biriai and Kilenge are traditional subsistence fishermen.

There are two commercial fishermen at Talasea.

A fishing group at Hoskins has lost interest, as they experienced transport difficulties last year and failed to sell 680 kg of fish.

Other problems are due to shortage of ice or freezer facilities, and shortage of nets. There are disputes over fishing grounds between net owners and villagers.

The present demand for fish in Kimbe is 3 tonnes a month. The 1976-77 programme aims to increase the fish catch for sale to 10 tonnes per annum.

Councils or private traders will be encouraged to make fishing gear available.

The Department will encourage the Hoskins fishermen's association to become interested again. The Department will assist in marketing of local catches in order to develop marketing facilities. An ice-making machine and coolroom will be installed at Kimbe.

Cold-smoking preservation will be encouraged at Talasea where ice supply is a problem.

A submission will be drawn up for foreign aid for a proposed pilot project in the province.

The following year catching will be

Vice-president of Gloucester local government council Molai Asap, inspecting his sun-dried birds-eye chillies.

consolidated at 10 tonnes per annum, mainly from the Hoskins area. The number of gill nets will be three.

Ice blocks will be supplied to fishermen at Hoskins and Talasea

Local people will be trained to do net mending for other villagers.

In 1978-79 we will investigate the possibility of establishing a small-scale fish processing industry, with fishing ships and factory. If feasible, this will be established the following year.

In the Hoskins area, the catch will be increased to 12 tonnes per annum in 1978-79 and the number of gill nets will be increased to five. In 1980-81 the catch will be increased to 15 tonnes per annum. All the local catch should be processed and consumed by the local town population.

Wildlife

One hundred thousand megapode eggs are collected each year.

The Pokili megapode nesting area has been declared as a wildlife management area. The wildlife committee at Pokili is very effective. Wildlife staff will continue to assist the committee.

There is a considerable amount of wildlife activity in the province, but shortage of staff is holding up progress.

Crocodile farms

Four crocodile pens have been stocked. The four groups are selling crocodile skins. Initially, K2 000 worth of skins were sold in two months.

Shortage of fish could hamper the success of the crocodile farms.

In 1976-77 it is expected that about K11 000 worth of skins will be purchased from the province. The Department will provide a market for crocodile skins.

Farmers will be shown how to improve

skin quality using Murpine preservation.

In 1977-78 the number of crocodile farms will be increased to six. The value of skins will rise to K15 000 in 1978-79.

A wildlife station will be developed for demonstration to villagers in 1978-79.

The possibility of establishing a small-scale tannery for crocodile skins and cattle hide will be investigated. If possible this tannery will be established in 1980-81.

In 1978-79 we will investigate the possibility of a villager starting a skin-buying business. If possible a villager will be buying skins and selling them to a dealer by 1980-81.

The number of crocodile farms will be increased to eight in 1979-80.

Cassowary farms

Two cassowary farms, at Berema and Sambaltepun, will be established in 1976-77. Two more will be established the following year.

Chillies

Chillies have good potential. About 5 000 kg per annum are produced, from Kandrian, where Sagsag school produced 40 kg, and from Gloucester.

In 1976-77 the aim is to plant 25 ha in the Kandrian area, and 2 ha in the Gloucester area. Chillies will be introduced as a cash crop at Arawe and Gasmata. Production is expected to be 10 000 kg.

Production will increase annually until it reaches about 30 000 kg in 1980-81.

Hot air driers will be constructed in 1976-77 at Kandrian, and in 1978-79 at Gloucester.

Coffee

There are 25 ha of coffee, in the Kandrian area. Production is about 860 kg per annum.

Village coffee plantings are not expanding very much due to interest in higher-priced crops and processing and marketing problems. With the present increased coffee prices it is expected that there will be renewed interest.

Arrangements will be made with a community school to harvest the garden at Esili. The Department will continue purchasing parchment coffee.

From 1977 to 1981 an increase of plantings to 30 ha is planned.

NATIONAL FISHERIES COLLEGE OPENS NEXT YEAR

The new National Fisheries College at Kavieng will commence operations next year.

Construction work on the college buildings is due for completion during January, 1977. It will then take two months to install equipment and furniture before the first student intake in April.

Courses offered during 1977 will be confined to in-service and upgrading training for serving fisheries officers.

Commencing in 1978 the college will offer a three-year diploma course in fishing; a two-year certificate course and short courses to cater for the needs of village fishermen.

"Papua New Guineans will be given first priority when students are being selected but it is anticipated that some students from other Pacific countries will also be accepted", he said.

Initially the college will accommodate 60 students but space for more students will be created if this is required. Accommodation will include space for eight to ten women students.

The college is hoping to recruit a woman graduate who will be head of the women's training.

Mr Mola said the existing fisheries training school at Madang will be closed down.

WESTERN HIGHLANDS PROVINCE

By Thomas Magei and Bob Thatcher*

The climate of the Western Highlands Province is characterized by fairly evenly distributed rainfall, ranging from a high of around 3 800 mm in the Jimi area, to a low of less than 2 500 mm in the Mount Hagen and Baiyer areas. The months through June to November are usually considerably drier than the other months, although this is not always the case.

Temperatures throughout most of the province average a maximum of 25° C and minimum of 15° C, although this pattern varies considerably according to altitude, proximity to high mountains and the amount of cloud cover at the time.

Thomas Magei

Thomas Magei is Provincial Rural Development Officer for the Western Highlands Province. He comes from Hangan Village, Buka Passage in the North Solomons Province. He attended Hutjena high school in the North Solomons Province before going to Popondetta Agricultural College in 1968-69. His first posting in 1970 was to Goroka. He worked in extension, specializing in cattle and tobacco. In 1971 he went to the Southern Highlands Province and was based at Koroba. He became officer-in-charge at Erave in 1972. After spending some time at the International Training Institute in Sydney in 1973, he was transferred to Goroka in 1974. In March of 1975 he came to Mount Hagen as associate PRDO, and took over from Mr Thatcher in September, 1975.

The central feature of the province is the Wahgi Valley which extends from the Mount Hagen area eastwards to the Kerowagi area of the Chimbu Province. The lesser valleys of the Baiyer, Nebilyer and Jimi, together with the Tambul Basin make up most of the populated area of the province.

The province is separated from the Southern Highlands by the Kubor Range to the south, from the northern part of the country by the Wahgi-Sepik Divide to the north, and from the Enga Province by the Mount Hagen Range to the west.

Most of the populated areas lie between 1 500 and 1 800 m above sea level, although the Mul Council and Tambul areas range to above 2 200 m, and the lower Jimi falls to around 400 m above sea level.

A considerable amount of land bordering the Wahgi River is very swampy and cannot be used economically at the present time.

The central swampy areas are basically alluvial soils with scattered organic soils. Peat is commonly found here. Much of the province has volcanic soils. Soils of the Dei Council, Tambul and Minj areas are generally fine-textured alluvium with minor areas of sand and gravel.

The valley areas generally consist of grasslands with sword grass and some shrub regrowth. Much of the upper Jimi area and the mountain ranges are rainforest ranging down to grasslands at the lower altitudes.

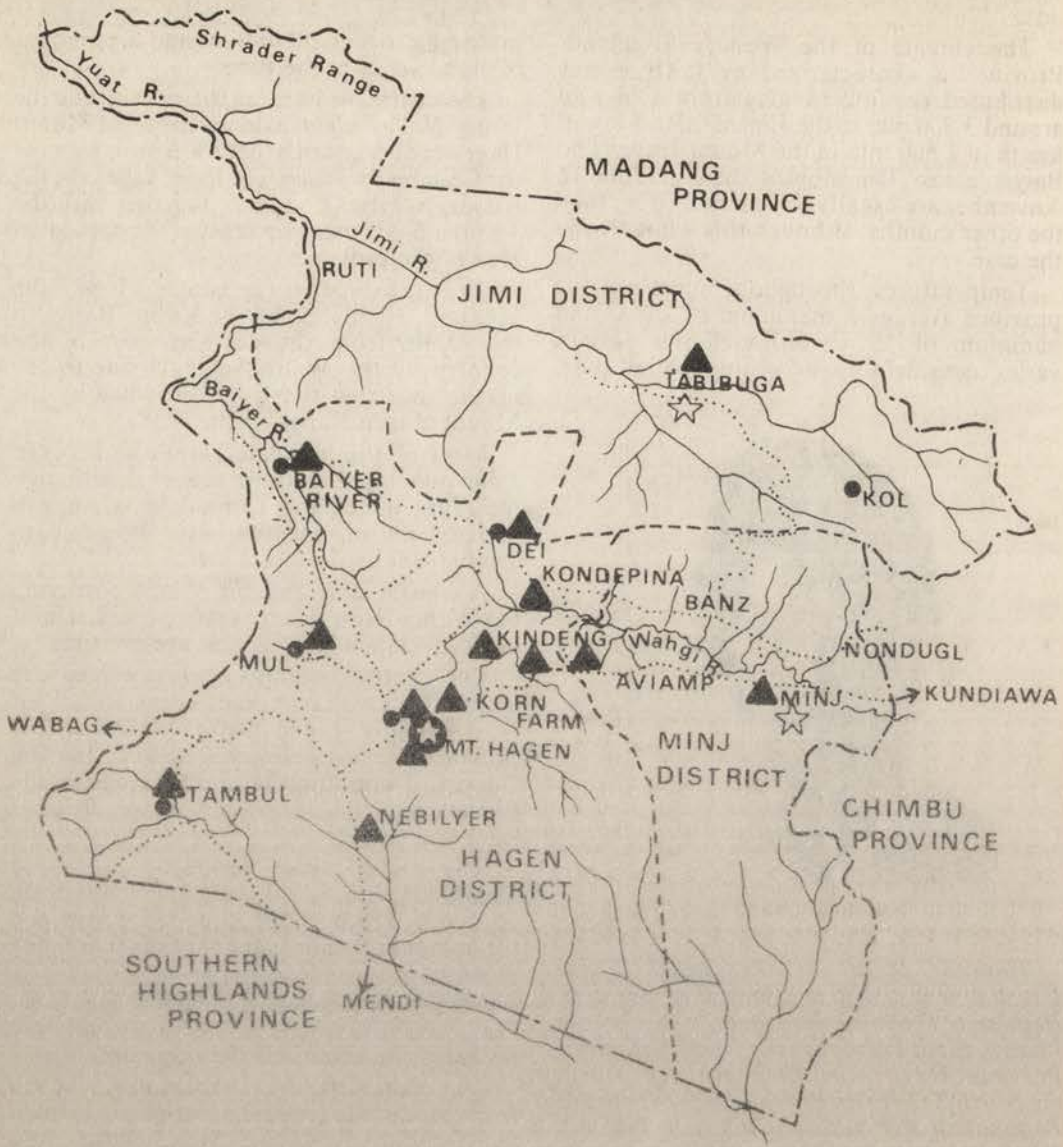
With the exception of the upper Jimi area, road communications are adequate and pose no barrier to economic development.

The main airfield is at Kagamuga, 11 km from Mount Hagen and airstrips are located at Tambul, Togoba, Minj, Banz and Tabibuga.

All stations have two-way radio scheduled communications, with the central Mount Hagen, Minj and Banz area serviced by automatic telephones. STD facilities are available to other areas of the country.

*Bob Thatcher, now a Lecturer at Highlands Agricultural College, was formerly PRDO, Western Highlands Province.

WESTERN HIGHLANDS PROVINCE



People

The total population of the province is about 204 000. The population is generally concentrated in the river valleys, the main population being located in the Wahgi, Nebilyer, Tambul and Baiyer valleys, and the upper Jimi area. There are three main languages, Medlpa, Tembuga, and Mid-Wahgi, with five other languages. Some minor language groups and hybrids between main language types are spoken throughout the area. Most people speak Pidgin with the exception of quite a few women and some of the older men.

Generally speaking absence of people from the village is not such a problem as it is in the less developed areas of the highlands such as Chimbu, Southern Highlands and Enga Provinces.

The traditional leadership structure revolves around "bigmen" in the different extended groups and clans. Public speaking ability and personal possessions such as pigs and coin are important in the leadership struggle.

The names of some important leaders are: Wamp Welya and Komp Dei (Hagen Mogi clan); Rumints and Pena Ou (Jiga clan); Tuman (Minj), Koyle, Wingui, Thomas Kavali (Jimi), Manembi (Kotna), Olik (Tega), Pung (Koibuga), Koim (Kuta), Pianalu (Baiyer River), Parua (Kotna), Maip (Muglamp), Mek Nugints (Mul) and Kaibelt Diria (Minj).

Two of the first prominent Hagen business leaders to emerge were Kup Ogut and Doa Mints. Kup was in the Legislative Council, a director of Hagen Coffee and the first of the Western Highlands people to be allocated a large holding on Madan subdivision. Doa, who died in 1975, had his large cattle, tea and coffee holdings converted to legal title. Paul Pora of Yamiga is on the board of directors of Air Nuigini as well as having a large trade store and approximately 250 ha of vegetables and cattle land.

Church leadership is significant in many areas, the main denominations represented being Roman Catholic, Lutheran, Nazarene and Anglican.

Several organizations based on self-help principles have sprung up within the province. These include: the Piblika Action Group based at Wurup near Mount Hagen, which is largely political; the Kopun Development Corporation formed by Thomas Kavali, MP, in the Jimi area; the Minj-Jimi Development Authority based in the Mid-Wahgi-Jimi areas; the Wahgi Tualo based at Minj, and Yangpela Didiman which operates throughout the province. Associations such as the Western Highlands Cattlemen's Association, the Mid-Wahgi Cattlemen's Association, the Wahgi Blokman's Association, and the Iambuga Vegetable Co., all agriculturally biased, exist throughout the province.

Areas in the Jimi area still cling to primitive beliefs such as sorcery which is strongly feared throughout the Jimi area.

Strong feelings of nationalism are emerging throughout the province, particularly among the younger generation. These feelings manifest themselves in the desire to acquire expatriate plantations, and the formation of such organizations as the Minj Group who are developing Olubus village with a view to improving the social and economic conditions at village level.

The province is renowned for its tribal fighting, most of which springs from perennial land disputes such as that between the Jiga and Yamuga groups near Mount Hagen. Such disputes tie up large areas of potentially productive land and are accentuated in the Mount Hagen to Nebilyer and Baiyer areas.

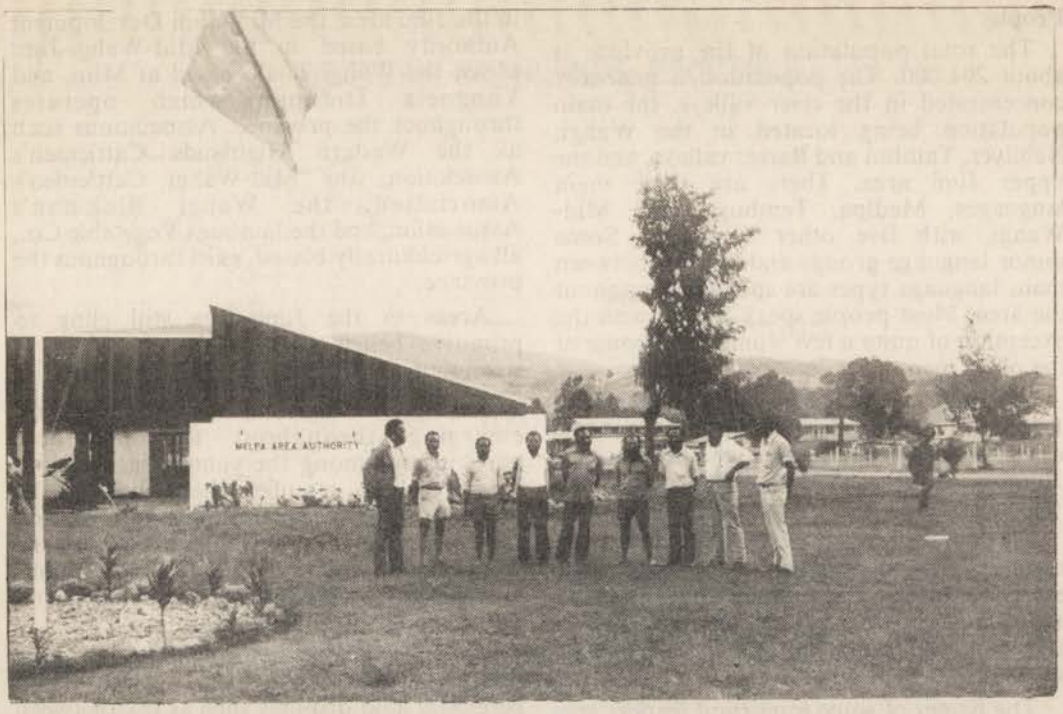
The province is well served by community schools, and has over 12 000 students attending 96 community schools, 1 teachers' college, 5 secondary schools and 1 technical college. Literacy programmes among older people are being carried out with reasonable success by mission groups.

There are five vocational centres which provide vocational training in agriculture, carpentry, mechanical skills and handcrafts.

At Korn Farm, near Mount Hagen, the Highlands Agricultural College has been established.

Yangpela Didiman is an active and successful organization which provides education and extension with a rural bias throughout the province. The aim of the organization is to achieve self-sufficiency in food and perhaps some cash income from the sale of surplus. The people in the Tambul and Wahgi areas are identified with this organization.

The staple food throughout the province is sweet potato, with various greens and local fruits making up the rest of the diet. Famine is



PRDO Thomas Magei with finance committee outside Area Authority Building.

rare in the province, and is usually caused by an extra-dry season when frosts are more frequent and insect build-up is accelerated.

The Jimi area is characterized by an extremely seasonal availability of food crops due to the traditional gardening method of the people.

Generally speaking, the major health problem throughout the province is malnutrition. This has been unrecognized by most authorities and most people throughout the province until very recent times. In the Jimi area, some 67 % of children attending clinics are undernourished. The province average is 24 % of all children attending clinics, obviously a severe problem. Many measures are available to combat malnutrition. However, the basic problem is that malnutrition is not accepted by the village people as being a problem, and an educational programme has been mounted in order to overcome this problem.

Political

All areas of the province are covered by local government councils.

The Mul, Dei and Baiyer Councils have given considerable assistance to the Department of Primary Industry in the provision of machinery and staff for agricultural projects.

Agricultural committees have been formed in most councils. Some of these are becoming successful as a means of communication with local people.

The Melpa Area Authority has given strong financial support to agricultural development throughout the province through grants and the purchase of machinery.

Members of the National Parliament are: Regional, Raphael Doa; Kompiam-Baiyer, Traimya Kambipi; Jimi, Thomas Kavali; Dei, Parua Kuri; Mul, Mek Nugints; Hagen, Pena Ou; Wahgi, Kaibelt Diria OBE; Tambul Nebilyer, Koitago Mano.

Economy

Coffee is the major crop by far throughout the province. However, plantings are concentrated in the Mount Hagen and Wahgi areas. New plantings in the upper Jimi area are flourishing.

Tea is another important crop. Most smallholder tea is planted on land settlement schemes at Kindeng, Kondepina, Nondugl and Avi. Land rationalization schemes are important also.

Some pyrethrum is grown in the Tambul area, although the acreage continues to decrease slowly.

Fresh foods are shipped to Port Moresby, Lae and Wewak.

The cattle industry is fairly well established, both expatriate and local sectors of the community being well represented. Pigs and poultry projects are of small importance. Sheep were doing well at the Avi land settlement scheme but have now been repositioned at Goroka in line with national research programmes. Peanut planting is increasing.

Moves are being made in the Minj area to grow tobacco as a major commercial crop and assistance is being sought from W D & H O Wills (PNG) Ltd with the project.

The Department of Primary Industry has two research stations, at Tambul and Kuk. At Tambul the main work is investigation into vegetable varieties, the establishment of a seed potato scheme, and improved high-yielding pyrethrum, while Kuk is mainly concerned with the development of clonal tea varieties and vegetable research. The province also has access to specialist staff from the Highlands Agricultural College.

There are about 500 Papua New Guinean owned trade stores with an estimated turnover of K350 000 per annum.

Cottage industries include the manufacture of stone axes for the tourist trade and wool weaving.

There are numerous markets for buying and selling local produce.

There is a continuing increase in participation by Papua New Guineans in trucking activities and produce buying.

It is estimated that about 40 % of businesses in the province are Papua New Guinean owned.

There is no large-scale mining in the province. A small amount of alluvial gold and silver is produced by local miners from the Pogera River.

There are six land settlement schemes, at Wurup, Avi, Kindeng, Madan, Kondepina and Nondugl. The main activity on these schemes is tea with a little diversification to coffee and market gardens.

AGRICULTURAL DEVELOPMENT PROGRAMME

Coffee

There are approximately 48 000 smallholder growers producing 8 000 tonnes per annum. The estimated average size of smallholder plots is 0.57 ha, with 1 396 trees, 8 % immature trees.

there are 45 plantations producing 5 000 tonnes from 2 500 ha.

There is increasing participation by Papua New Guineans in coffee buying.

In the past the Department put coffee extension work on a low priority as growers were familiar with correct cultural practices. Recent developments in the International Coffee Agreement indicate that the government should more actively promote the crop, to take advantage of higher prices and the suspension of quotas.

Current policy is to continue expansion in lesser developed areas and to consolidate and improve quality in the better developed areas.

In 1976-77 extension staff contact with growers will be increased by basing staff in the main growing areas. Staff will encourage farmers to maximize production.

Patrolling in remote areas (Jimi, Baiyer, Mul, Nebilyer) will be increased and nurseries will be established. New plantings of 100 ha will be made at Jimi and another 100 ha in other areas.

Nurseries will be established at Pugmi, Minj, Banz, Kambia and Nondugl.

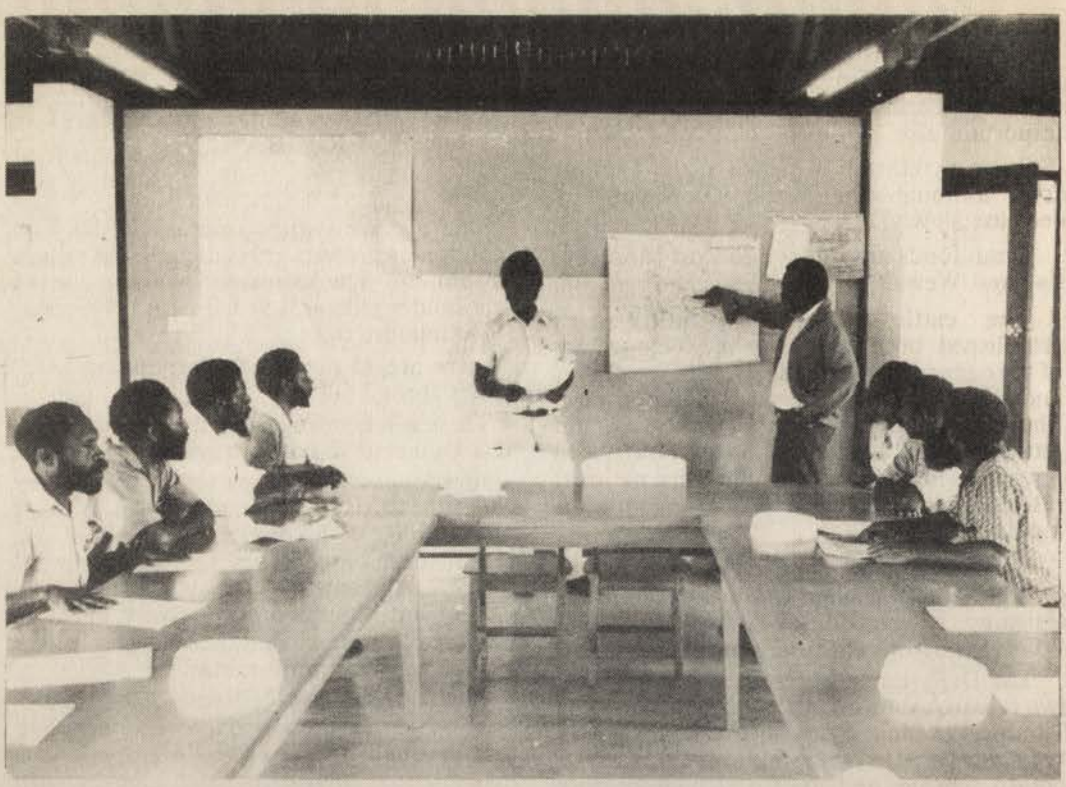
Eighty ha will be planted among 300 smallholders on all land settlement schemes—Kindeng, Avi, Madan, and Kondepina.

Farmers will be encouraged to combine coffee with other activities, e.g. tea and coffee, vegetables and coffee and, when possible, cattle and tea.

In 1977-78 it is anticipated that a central coffee mill will be established at Tabibuga to handle present parchment production. It is planned that the government will buy one of the best plantations in the Wahgi Valley to be used as a training centre for prospective local plantation managers and assistants.

Plantings in remote areas will continue, with 120 ha at Jimi and Baiyer River.

In 1978-79 the government will develop a



Thomas Magei presenting agricultural development programme to the Melpa Area Authority finance committee

plantation management training scheme. It will train 20 to 30 managers and assistants a year.

In 1979-80 possibly half of the plantations will be purchased by local people or companies.

Tea

There are 410 smallholder growers now harvesting tea, from 166 ha. The main areas are Minj, with 33 ha, all land settlement schemes (Kindeng, Kondepina, Nondugl and Avi) with 74 ha, and Wurup with 59 ha.

There are 100 growers with newly planted clonal tea. At Madan and Kindeng growers have started picking 10 ha.

Production by smallholders is 673 tonnes of green leaf per annum.

There are six companies with ten plantations, a total of 3 055 ha, producing 5 200 tonnes of black tea.

The attitude of the smallholders varies. The Chimbu farmers on the Nondugl land settlement scheme and the Wurup people on their land rationalization scheme are very enthusiastic.

The Department of Primary Industry has arranged for sale of green leaf tea to factories in the area.

The current policy is to encourage replacement of seedling tea with clonal tea which it is expected will yield twice as much as the seedling tea.

The Department has clonal nurseries at Avi and Kindeng, which produced 300 000 cuttings per annum. The excess is sold to plantations.

In 1976-77 extension staff will encourage improved management on existing projects.

As seedling tea production declines farmers will replant with clonal material. About 200 blocks (20 ha) could be ready by late 1976.

In 1977-78 it is anticipated that soil fertility in presently high-yielding areas in Wurup (where production is 9 800 kg/ha, approximately twice African figures) could decline. Without fertilizers, yields would drop accordingly. If pruning and picking is well

managed this may not occur, but the possibility should be considered. The effect of tea-growing on the fertility of peat soils is also unknown.

Cattle

There are 1 178 head of cattle on 157 village cattle projects. Minj is the main area with 35 projects and 338 head. Mount Hagen has 67 projects and 453 head, and Kindeng land settlement scheme has 34 projects and 233 head.

There are approximately 1 000 head on plantations.

The Department of Primary Industry runs a major breeding station at Baiyer River running some 5 000 head of cattle.

Last year 200 ha on the forestry base at Kindeng were stocked with 150 head.

The annual turnoff through the Korn Farm abattoir is 323 from village cattle projects, and 1 163 from plantations. Abattoir turnoff figures are low as stock go to singsing markets in the Western Highlands, Southern Highlands and Chimbu Provinces, where they get higher prices. Also plantation herds supply village projects with stock.

Village cattle project owners are keen but management is poor. The present natural increase is generally low, at 53 %. Some projects have no bulls.

In 1976-77 three short courses in management are to be held for all farmers at Baiyer River. It is hoped that natural increase will be improved to 60 %.

Improved pasture is to be established on all projects, at least 2 ha per project this year. (Last year 100 ha were improved mainly at Mul, where 50 ha were improved.)

Stocking of the Kindeng forestry base project will be completed with another 60 head.

Extension staff will ensure that there is adequate water supply on all projects, starting with Kindeng land settlement scheme.

New projects will be established at Kindeng (6), Mul (9) and Minj (15).

A slaughter slab may be established at Minj.

The Western Highlands Province Cattleman's Association was formed last year (1975). Extension staff will help the Association to develop a greater level of self-reliance, with greater involvement in stock transportation, supply of equipment, and fencing material.

In 1977-78 six new projects will be established, with 200 head, mainly in the Mul area. Pastures will be improved and renovated by a further 2 ha per project.

In following years the programme will be mainly consolidation of existing projects. With natural increase of stock maintained at at least 60 %, and restocking the village projects, herds could be approximately 2 000 head on 250 projects by 1980-81.

With adequate slaughtering facilties and farmer education less stock will be slaughtered at singsings and more will be marketed through abattoirs.

Estimated beef sales from village projects will be 66 tonnes per annum in 1979-80.

By 1980-81 it is anticipated that the Cattleman's Association will be managing most of the village cattle industry, with the government providing animal health services and research.

Subsistence and nutrition

Up till now there has been a general lack of awareness among government officers of nutritional problems.

The Provincial Nutrition Committee, with representatives from Primary Industry, Health, Central Planning Office and the Prime Minister's Department, was formed in 1975. The missions will also be asked to have a representative on the Committee.

A "malnutrition ward" demonstration garden has been established at Mount Hagen Hospital.

Legume seeds are being distributed by the nutritionist in the Jimi area.

Community schools are becoming more aware of and involved in the nutrition programme.

One of the problems is that farmers produce nutritious foods for sale rather than for home consumption. The 1976-77 programme includes a plan to educate government staff so that they can in turn advise the farmer, and to include this problem in the National Broadcasting Commission nutrition programme "Nek bilong Tarangau"

Nutrition staff from the Health Department will be asked to attend Department of Primary Industry conferences and seminars.

Farmers will be encouraged to produce indigenous green vegetables for sale rather

than the less nutritious European type green vegetables.

Extension staff will maintain a close watch on subsistence agriculture to anticipate and rectify food shortages.

Primary Industry and Health will develop nutrition gardens of 0.5 ha, for demonstration and distribution of planting material, at Minj, Wurup, Mugwump and Nogoba. Field staff will also collect samples of traditional food plants for analysis by the Department of Primary Industry headquarters, if possible.

In 1977-78 government officers will be encouraged to grow their own "backyard gardens" for both food and demonstration.

The number of demonstration gardens will be increased where required, possibly in the more remote areas.

The possibility of using small cultivating machines in commercial food gardens will be investigated.

In 1978-79 field staff will concentrate on promoting those traditional foods which have been found to have the best food value, with possible inclusion in menus at hotels and institutions.

The impact of the education programme on village families from education of school children will begin to be felt by 1980-81.

Pigs

Semi-commercial piggeries are established through all areas of the province, but concentrated in the Mount Hagen and Wahgi areas. In the Kindeng and Madan area there are an estimated 300 free-range pigs in the Wahgi swamp. At Minj 90 semi-intensive pig projects have been established with 460 head.

Generally speaking, Departmental policy is that intensive piggeries should not be established. This is because poor management and the high cost of feed generally make them unprofitable. Village pigs which are free-range, and thus have no feed or managerial problems, sell for a high price for singsings.

In 1976-77 the Department will concentrate on developing low cost piggeries. Ten will be established in the Minj area and ten at Kindeng. These piggeries will not be financed by Development Bank loans. Where possible, free-range piggeries will be encouraged.

The Department will continue to investigate the possibilities for growing feeds locally—corn, soya bean, lupin, etc.

An investigation will be carried out into the possibility of development of intensive or semi-intensive piggeries close to town, to supply the urban demand for pork meat.

However, unless management and feeding problems are overcome there is little hope for expansion for pigs in the immediate future.

Poultry

There are at present four poultry projects on the Kindeng land settlement scheme, with 150 birds each, and three projects at Minj with 52 birds each. They are all free-range.

The Yangpela Didiman movement is having a lot of success in encouraging intensive poultry projects. Under the supervision of Yangpela Didiman extension staff, these projects are well managed with adequate feed.

In 1976-77 Department of Primary Industry staff will increase liaison with the Yangpela Didiman movement, to adopt a common approach to intensive poultry projects.

Sheep

The majority of sheep in the Western Highlands were held at the Highlands Agricultural College. These sheep have now been moved to an experimental project at Lae. Expatriate plantations in the province still hold a few sheep.

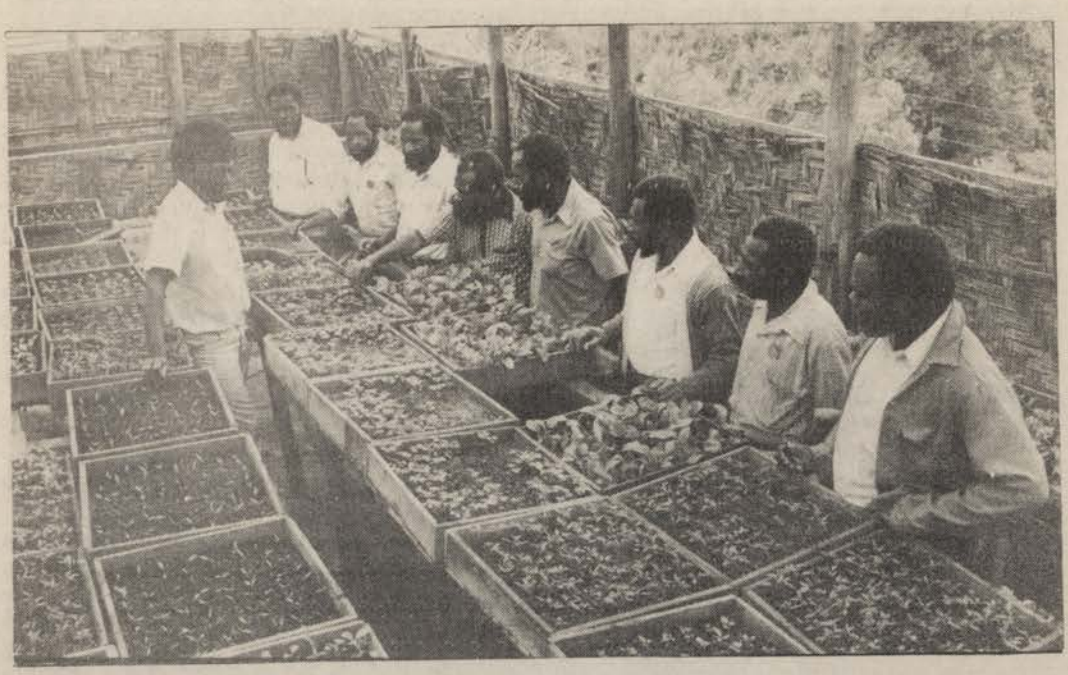
Further development depends on the results of the current experiment programmes being carried out in other provices. If these programmes are successful it is proposed to establish one 40-ewe project at Minj and one 12-ewe project at Avi land settlement scheme, within 18 months. There will be two rams at Minj and one ram at Avi.

Pyrethrum

There are approximately 30 ha of pyrethrum producing 16 tonnes of dried flowers per annum. The area of prethrum has shown a continuous decrease over recent years. The Department is attempting to maintain the current area, and there will be more extension work to promote further plantings at higher altitudes.

In 1976-77 we hope to maintain village plantings at the existing level and introduce a further 10 ha.

Four areas of 5 ha each will be established at Tsinsibai with a new high-yielding variety.



Melpa Area Authority members discuss vegetable seedling production with Thomas Magei.

This high-yielding variety will be supplied to farmers for replanting, and in 1977-78 there may be a doubling in the Tambul production due to harvesting of the improved variety plantings.

Land Rationalization and Land Settlement Schemes

Land rationalization is the organized subdivision of traditionally owned land where the people allocate blocks to clan members. This began in the Wahgi Valley in 1963 at Wurup. Sometimes legal title is obtained.

There are a total of 210 blocks at 11 centres, mainly in the Wahgi Valley. Block sizes average 4 ha and total involved is approximately 1 000 ha.

Land settlement, or the subdivision of government-owned land, began in about 1964 at Nondugl. Blocks are made available to local people as well as people from other provinces such as Chimbu.

There are now 550 blocks on eight separate areas totalling 2 300 ha. This includes two schemes, at Pugmi and Ambra, totalling 350 ha which were subdivided for development as cattle schemes. These blocks range from 12 ha to 50 ha. All other land settlement blocks average about 4 ha, and are planted with mainly tea, coffee or vegetables.

In 1976-77 47 new blocks at Mobori and Ambra will be investigated.

The possibility of drainage of Tsinsibai swamp will be investigated, and a land utilization plan will be investigated.

On South Swamp, drainage of 121 ha of forestry land will be commenced. Extension contact will be made with squatters on South Swamp. Pig ground will be surrendered to the government to enable the construction of levees.

Cabinet has now approved investigations into the development of the Wahgi swampland. Foreign aid will be sought for the initial study, and foreign funds will be needed to provide machinery and skills for the development. Swamp reclamation will provide land for forestry development and possibly smallholder blocks for tea planting.

Avocado and citrus

There are 6 ha of citrus trees and 3 ha of avocado trees established. These are high quality grafted varieties.

In 1976-77 in-service training courses will be run to educate staff in avocado and citrus-growing, and in bud-grafting techniques.

Seedling nurseries will be established at Baiyer River, Nebilyer, Jimi River and Wahgi.

In 1977-78 the area planted to grafted trees will be increased to 16 ha of citrus and 6 ha of avocado. Plantings will be increased annually to a planned 50 ha of citrus and 25 ha of avocado in 1980-81.

Peanuts and beans

The area of peanuts is estimated at 220 ha, in food gardens. Soya bean seed and other legume seeds have been distributed in the Jimi area.

People in the Dei Council and Muglamp areas have shown great interest.

In 1976-77 seed propagation plots will be established at all base camps for soya bean, peanuts, peas, winged bean, broad beans and lupins (as stock feed).

The Department will investigate the use of small hand tools.

Plantings of peanuts will be increased to 260 ha. Three 5 ha plots will be established at Minj. Village people will be encouraged to make better use of peanuts as a protein supplement in their diet. A programme to encourage farmers to cook and eat peanuts rather than just sell them in the market will be commenced.

Cardamoms

There are 1.2 ha of cardamoms planted in Jimi villages.

In 1976-77 cardamom nurseries with a planting potential of 17.6 ha are planned in the Wahgi land settlement scheme and the Jimi area.

In-service training for staff will be carried out over the next two years.

In 1977-78 the area planted to cardamoms will be increased to 20 ha and by 1980 to 100 ha.

Chillies

Chillies are still a "backyard crop".

Promotion of chillies in the Jimi area will continue in 1976-77. Production is expected to increase to 5 tonnes.

With continued expansion, production in 1977-78 is expected to be 10 tonnes.

Tobacco

Fire-cured tobacco is sold at local markets. Private tobacco companies provide supervision of the flue-cured tobacco production. Possible development of the tobacco industry, depending on attitude of the people, the companies and world prices is expected in 1978-79.

Fresh foods

Since the start of the fresh food project in early 1974, production of fresh foods for sale has steadily increased. About one-third of production is sold locally, in local markets and to institutions in Mount Hagen. The remainder of the produce is shipped to Port Moresby, Lae and Wewak.

Last year it was estimated that approximately 600 tonnes of staple food were sold at the Mount Hagen town market, and 1 200 tonnes at local markets at Minj, Banz, Baiyer, Mul, Dei and roadside markets.

Six hundred and fifty tonnes (excluding potatoes) were air freighted to Port Moresby and Wewak. Thirty tonnes of potatoes were sent to Lae.

Production of the higher-priced vegetables such as cauliflower, broccoli and brussels sprouts is encouraged, while at the same time planting of vegetables such as beans and cabbages, which are easy to grow, and usually oversupplied, is being discouraged. People are discouraged from growing greens for the fresh food market as they grow easily on the coast.

Quotas have now been set for production of some vegetables, and small lots are being discouraged, as sales of for example 100 kg brussels sprouts are difficult to organize.

A general problem is maintaining a regular supply from growers.

In 1976-77 the Department will ensure that the demand from local institutions is satisfied before export requirements for other provinces. Extension officers will maintain a watch over all local markets to ensure that adequate fresh foods are available at all centres. An adequate supply of fresh foods locally will replace imported fruits and vegetables. We will investigate the possibility of a need to regulate the price paid by the consumer to the grower.

The supply to the Wewak market will be developed, and when this market is satisfied, the supply to the Port Moresby market will be improved. Cooler trucks may be introduced for transport of vegetables to Lae.

The Department will maintain seed distribution to all centres.

In 1977-78 the demand from other provinces for vegetables will decrease as coastal people produce more of their own

food. Cabbages and other leafy European vegetables could be cut down. Exceptions could be potatoes and carrots, which do not grow well in the lowlands.

In 1978-79 maize meal could possibly be encouraged as a replacement for wheat flour in making bread.

Bee-keeping

There are now about 50 hives in many locations, and commercial honey production shows good possibilities.

Bee-keeping is a new industry for Papua New Guinea. At the moment the programme is still in the trial stage. The number of apiary sites has caused transport to be a problem.

An overseas expert is needed to advise the industry, and train Papua New Guineans.

If funds, transport and expert advice are available, expansion to 300 hives could take place in the Wahgi area in 1976-77. This would provide a training centre for intending beekeepers, and a source of bees for them. Bee-keeping could be taught at Highlands Agricultural College and some schools.

Research will continue, including research into pollen production.

In 1978-79 a co-operative for local beekeepers is planned, including facilities for a central extracting system. Markets will be investigated. Income from the central apiary would be used to expand it with a view to its becoming economically independent.

The co-operative will develop in 1979-80 to handle bulk equipment purchases, honey extraction and sales. The co-operative should be self-supporting by 1980-81, employing a manager and staff and providing members with services as outlined above.

Fish

The objective of this programme over the last 10 to 15 years has been to introduce fish to rivers and ponds to supplement the subsistence diet.

Carp have been of little success in ponds but there are many in the Wahgi backwaters.

Trout have been released in ten rivers since 1967. They have shown good growth rates of 1 to 2 kg in four years, and they are breeding.

In many rivers the fish population population has been wiped out by poisoning with derris juice, by catching of immature fish, and by catching during the breeding season. There are very few trout now in the Kumdi and Gumants Rivers due to poisoning. The Minj River was poisoned in 1974, so restocking has been done.

Some Hagen and Tambul leaders now enforce a closed breeding season of one year.

Ample supplies of trout fingerlings are available from the Mendi government hatchery.

In 1976-77 local government councils are to introduce by-laws to protect the immature and breeding fish, e.g. fishing prohibition for one year after release of fingerlings, and prohibition of fishing for three months in upper reaches of rivers where trout are spawning. Councils will police these laws.

The Department will restock rivers with trout where fish protection laws are operating.

An intensive education programme will be commenced, aimed at making people aware of the advantages of letting the fish grow and breed.

Mixed success is expected from the council legislation, resulting in the fish population of some rivers being completely depleted.

If control of fishing is not possible, then local government councils will set up a central trout hatchery in 1978-79 to supply all rivers with adequate numbers of fingerlings each year.

By 1980-81 there is the possibility of development of a tourist trout-fishing industry. Trout will also by then be regarded as an important cash crop.

Wildlife

The only wildlife activities in the province are the bird of paradise sanctuaries at Baiyer River and Nondugl. They both play a very significant part in the highlands tourist industry.

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