harvest

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Front cover: A Japanese boat tuna fishing in New Ireland waters. Transparency courtesy of the Office of Information.

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Department of Agriculture, Stock and Fisheries,
Port Moresby,
Papua New Guinea

BAITS FOR GIANT AFRICAN SNAILS

The giant African snail *(Achatina fulica)* was introduced into Papua New Guinea by the Japanese during the war. It is now established on the Gazelle Peninsula and Kimbe areas of New Britain, on New Ireland, around Kieta on Bougainville, at Port Moresby, on Manam Island and around Bogia in the Madang Province, and at Popondetta.

The snails can do a lot of damage to food gardens and they can destroy vegetable crops such as Chinese cabbage and beans. Often damage is very bad when the snails are new to an area. There are several baits that can be used to kill the snails. A bait is a poison mixed with something that snails like to eat.

It is possible to buy commercially prepared baits in stores that sell agricultural supplies. Some of these are Blizen Snail Killer, Defender Snail Killer, and Mesurol bait, and instructions for their use are printed on the container.

It is also possible to prepare a bait yourself. This is usually cheaper than a ready made bait and will last longer. You need sawdust, cement and a chemical called metaldehyde. Snails like to eat metaldehyde but it kills them when they eat it. Metaldehyde can be bought from stores which sell agricultural supplies. The sawdust, cement and metaldehyde should be mixed in equal volumes with a little water. The mixture is placed to dry on a flat surface such as a piece of timber. It needs to be dried in the shade. When the mix has set hard it is broken up into pieces about 2 centimetres across.

The pieces of bait are placed around the outside of the garden and inside it. They should be placed about a metre apart. Snails will eat the baits and die.

Shells of dead snails. If snails are eating your garden, you can put a poison in the garden to kill them. Photo by R. M. Bourke.

NEW CORN VARIETIES

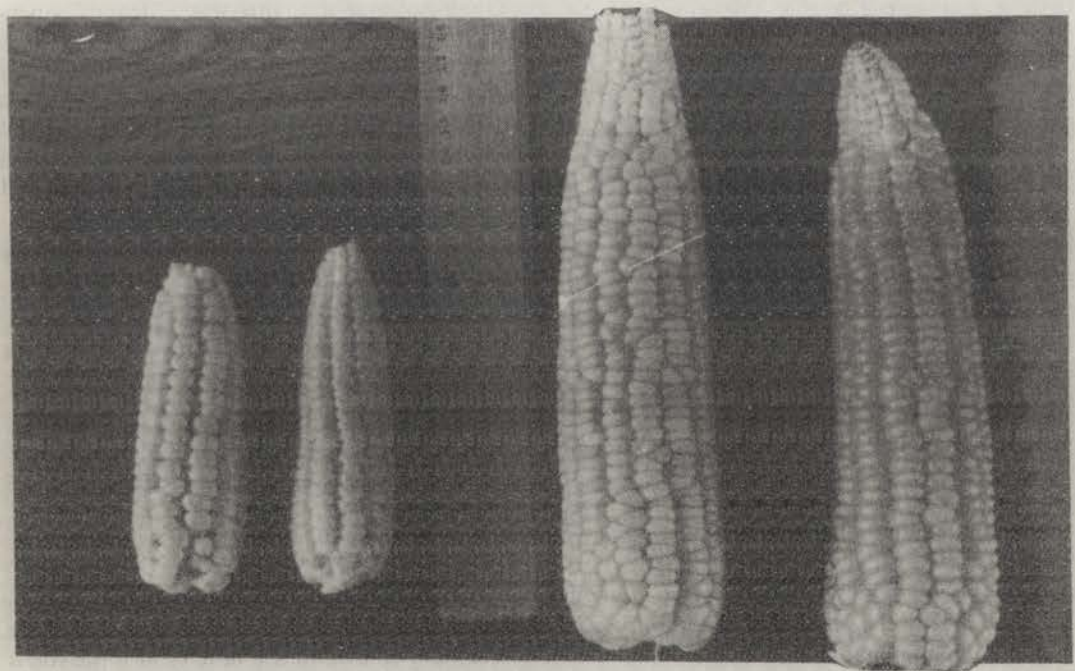
By R. Michael Bourke, Agronomist, Lowlands Agricultural Experiment Station, Keravat

Local varieties of corn (or maize) in Papua New Guinea are often poor and do not yield a large cob. Various people have brought in corn from Australia and other countries, trying to find a better variety for Papua New Guinean conditions. Some of these have been better than the local varieties and some have not. Many of the varieties of corn seed sold in shops are not very good ones. In 1970 DASF started a programme of bringing in corn from all around the world and trying it out. This work was started at Keravat near Rabaul and has also been done in the Markham Valley, at Kuk near Mount Hagen and at Aiyura near Kainantu. The Keravat work has been completed and DASF can now recommend and provide seed of corn varieties that are very much better than local ones. The work is continuing in the Markham Valley and in the highlands.

At Keravat over 50 varieties have been introduced and tried in five trials. These came from 13 countries as far away as the Ivory Coast, Thailand, Australia and Brazil. The seed came via Queensland and was kindly sent to Papua New Guinea by the Queensland Department of Primary Industries. Varieties are recommended because they are high-yielding and are more resistant to rusts than other varieties.

Corn varieties are either hybrids or open-pollinated types, and we have been trying both types. Hybrids often yield better than the open-pollinated ones. However they have the disadvantage that seed should not be replanted for a second crop. If seed is replanted, the next crop will not yield well. New seed must be bought and planted for every crop. Hybrids are the best sort of corn for farmers who can obtain new seed supplies for every crop, such as plantations and schools, but they are not generally suitable for village farmers.

Open-pollinated corn does not yield quite as well as the hybrids, but the seed can be replanted for each new crop. This is the best



The two small cobs on the left are from the local Gazelle Peninsula variety. The two large cobs on the right are from one of the new open-pollinated varieties being intoduced and distributed by DASF.

sort of corn for village farmers, and probably most farmers in Papua New Guinea.

We have also brought in and tried other sorts of corn such as high lysine types. High lysine corn has a lot of lysine in it. Lysine is one part of protein and man must eat lysine to remain healthy. High lysine corn could be very useful for people who eat a lot of corn and who do not eat enough protein. However none of this type has done well and we are not distributing them.

The table gives yields of some of the varieties in the last Keravat trial. From the table it can be seen that most of the introduced varieties are much better than local Papua New Guinean ones.

Corn Yields in Variety Trial No. 5 at Keravat

Variety	*Type*	*Origin*	*Yield kg/ha*
KTW 221	hybrid	Queensland	7 225
KTW 239	hybrid	Queensland	5 658
Q 12508	open-pollinated	Mexico	5 604
Q 12544	open-pollinated	Mexico	5 354
QK 217	hybrid	Queensland	5 060
Q 12504	open-pollinated	Mexico	4 950
Q 12152	open-pollinated	Brazil	4 907
Q 12505	open-pollinated	Thailand	3 432
Q 10859	open-pollinated, high lysine	Thailand	2 591
Kapogere	open-pollinated	Papua	2 086
Local Gazelle	open-pollinated	New Britain	1 887

RECOMMENDED VARIETIES

Hybrids. QK 217 is the best of the commercially available hybrids evaluated at Keravat. It was bred and produced on the Atherton Tableland of North Queensland. It has done well in trials at Keravat and also at Aiyura, Wabag, and Muralumi in the Markham Valley. Seed can be purchased in 25 kg packs from—

The Manager,
Atherton Tableland Maize Marketing Board,
P.O. Box 19,
Atherton, Qld 4883,
Australia.

Generally we have found the Atherton hybrids to be the best for Keravat conditions. They are resistant to tropical rust and have proved to be high-yielding. Unfortunately, there are other better-yielding Atherton hybrids, such as KTW 221 and 239, which are not commercially available.

Hybrid varieties available change from year to year. Varieties most suited to North Queensland conditions are not necessarily the best in Papua New Guinea, so that new releases from Queensland may not be better than the present recommendations for Papua New Guinea.

Maize seed from Australia or New Zealand can be imported without a permit, but importation from other countries is not allowed.

Open-pollinated varieties. Four open-pollinated varieties are recommended. They are being distributed free from Keravat. They are Q 12508, Q 12544 and Q 12504 from Mexico, and Q 12152 from Brazil. This last variety has done well in trials at Keravat and also in the Markham Valley. It was the best variety in two of the trials.

Seed of these varieties may be obtained by writing to—

The Agronomist-in-charge,
Lowlands Agricultural Experiment Station,
Keravat,
East New Britain Province.

The quantity of seed required should be stated.

Growing high-yielding corn

These high-yielding corn varieties will do best in fertile soil. Fertilization may be necessary to obtain the best yield if the soil is poor. *If fertilizer is needed, apply urea at the rate of two bags (100 kg) per hectare.* This

would be enough in most places, but phosphate fertilizer may be needed, particularly in the highlands.

Provided rainfall during the life of the crop is expected to be enough, plant the seed fairly closely, say in rows 70 cm apart at 20 cm within the rows. At this rate about 17 kg of seed is needed per hectare. (In dry areas, such as around Port Moresby, it may be advisable to plant the corn at slightly wider spacings.) Corn can also be interplanted with other crops such as sweet potato. However if the corn plants are too far apart, the seed from the first crop will not give such a good second crop when planted again. This is because the corn plants were not planted close enough to fertilize each other. This is probably one of the reasons that local corn is poor.

The recommended varieties produce hard seed in 14 to 15 weeks which is a little longer than the existing varieties. Corn to be used for eating will be ready a few weeks earlier than this.

When farmers have grown one crop of the new corn varieties, they can then carry out a further selection themselves to get the best variety for local conditions. The farmer should choose only the best cobs from his crop to provide seed for replanting. If seed from a few plants only is used, the following crop will not be as good. It is better to take seed for replanting from a mixture of seed from at least 100 good cobs. In this way the variability of the variety will be kept and good crops can be had from many plantings.

Most village farmers save only a few cobs to give seed for replanting, so their yields will decline slowly over a number of years. It may be necessary for further distribution of seed to be made by DASF extension officers every few years.

It is not possible for us to try out the new varieties in every province, so if you grow one of the new varieties, we would appreciate it if you would send us a report on how the variety grew. In this way we can find out the best variety for every area.

Most of the varieties evaluated at Keravat were supplied by the Queensland Department of Primary Industries Research Station at Kairi in north Queensland. Their assistance is gratefully acknowledged.

NEED TO BUILD UP COFFEE PRODUCTION

Under the terms of the recently negotiated International Coffee Agreement, there is a real likelihood of quotas on exports of coffee to member importing countries being reintroduced during the life of the agreement.

There is a need for a national effort now to produce as much coffee as possible for export over the next two years, in order to increase Papua New Guinea's quota entitlement under the terms of the new agreement.

All smallholders should be aware of the necessity to maximize production from their existing holdings. Officers of the Department of Agriculture, Stock and Fisheries are available to give advice and assistance whenever requested.

The smallholder will benefit in two ways by sustained effort now: firstly by obtaining a high price for his parchment coffee produced and sold during the next two seasons; secondly by maximizing production now Papua New Guinea will be able to sell a higher proportion of her crop overseas if and when quotas are reintroduced.

SUPERSWEET CORN FROM HAWAII

By A. Kimber, Agronomist-in-charge, Highlands Agricultural Experiment Station, Aiyura

A new kind of sweet corn, known as Hawaiian Supersweet 4, was introduced into Papua New Guinea in October, 1970. It had been bred for tropical conditions in Hawaii and it was reported that it grew well there.

When it first arrived in Papua New Guinea, it was grown at Laloki and Keravat in the lowlands, and at Aiyura and Kuk in the highlands, for a number of generations.

It has a very sweet taste which most people like. The cobs are smaller than some other varieties.

What is the difference between ordinary corn, sweet corn and supersweet corn?

The kind of corn that is most widely grown by people in Papua New Guinea, and right through the whole world, is not very sweet. This is because the starch which makes up most of the grain is itself not sweet.

However, many people like ordinary corn varieties, and if this is your choice, there is no reason why you should change. But if you prefer a sweeter corn you may be interested in the new variety described here.

This new kind of sweet corn, Hawaiian Supersweet 4, has a very high content of sugar in the grain. The sugar content is about 10 times that of ordinary corn and four times that of sweet corn, and this is why it is called "supersweet".

Another good thing about this supersweet corn is that it does not lose its sweetness after it is picked. It also remains sweet after it is cooked.

What does Hawaiian Supersweet 4 look like? In the Hawaiian lowlands it is reported to grow nearly 3 m tall, but here in Papua New Guinea it seems to grow no higher than 2 m.

The supersweet plant does not tiller, that is, there is only one stalk. The cobs are quite normal in appearance at the stage when they are eaten, but as the grains become hard, they shrink and become wrinkled. This is shown in the picture on the next page, which compares grains of ordinary corn with grains of Hawaiian Supersweet 4. People may think that the hardened grains are no good for replanting, but this is not so. They will produce normal plants if the seeds germinate at all. If you plant 100 seeds probably only 60 of them will grow into mature plants. But from these sixty plants you will get a good crop.

Supersweet corn plant with cobs.

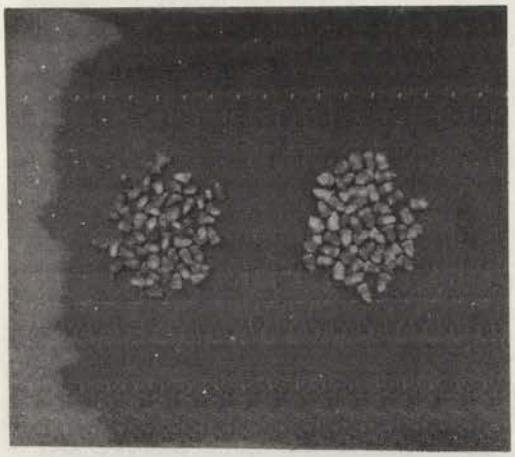
Will supersweet corn be useful? It is not intended that supersweet corn should replace ordinary corn entirely in Papua New Guinea. It is expected, though, that many people will want to try it out in their village gardens.

It should sell readily in town markets, especially as it does not lose its sweetness or softness after picking. It can be eaten uncooked, or it can be cooked by boiling, baking, or in a mumu, in just the same way as any other kind of corn.

In the bush, it could be used in much the same way as sugar-cane is used, for eating during long walks from place to place. Like sugar-cane, its high sugar content means that when it is eaten it gives a person energy very quickly.

How can it be grown? For best yields, Hawaiian Supersweet 4 should be grown at spacings of 1 metre by 30 cm. At this spacing you can expect two good cobs on each plant.

As already mentioned, not all the seeds planted will grow, so it is recommended that two seeds be placed in each planting hole.



Supersweet corn is shown on the left and ordinary corn on the right. The supersweet grains are smaller and may be quite wrinkled by the time they are ready for planting.

In the lowlands it takes about 60 days after planting before the corn is ready for eating, and about 90 to 100 days to obtain hardened grain ready for replanting. In the cooler climate of the highlands, everything takes a bit longer. There, the corn can be eaten about 110 days after planting, and the seeds will be ready for replanting after 140 to 160 days.

In most trial plantings, the variety has been fairly free from disease, except for minor infection with common maize rust. However, in a wet season planting at Kuk, near Mount Hagen, it was heavily infected with leaf blotch disease. On the whole, it is not expected that any serious disease will affect the corn.

Hawaiian Supersweet 4 is an open-pollinated corn, which means that it is very suitable for village and home gardens, because it can be grown from its own seed and still remain true to type.

However, to avoid cross-pollination with other types of corn it must be grown at least 200 metres away from them.

Alternatively, the time of planting could be arranged so that it would not flower at the same time as other corn in gardens nearby.

Seed of Hawaiian Supersweet 4 is usually available from the Highlands Agricultural Experiment Station, Aiyura, Eastern Highlands Province; and the Lowlands Agricultural Experiment Station, Keravat, East New Britain Province.

This article first appeared in the *Post-Courier* in May, 1975.

BEETLES JOIN WAR AGAINST BUFFALO FLY

Hundreds of dung beetles have been let loose in PNG to battle the blood-sucking buffalo fly.

The buffalo fly sucks blood from cattle up to 40 times a day and up to 10 000 can settle on one beast.

The dung beetle was introduced as a result of a request from DASF to the Australian Commonwealth Scientific and Industrial Research Organization.

Mr Ted Fenner, the Chief Entomologist, said that the dung beetle was introduced to decrease the buffalo flies, and also to increase dung fertilizer.

Dung beetles bury cow dung, so that the buffalo fly cannot breed in the dung. The buried dung increases the fertility of the soil.

Dung beetles have been distributed in the Central, Northern, Morobe, Madang and East New Britain Provinces.

DASF has its own dung beetle breeding laboratory in the Northern Province.

PNG JOINS FAO

Papua New Guinea has become a full member of the United Nations Food and Agricultural Organization.

The Minister for Primary Industry, Mr Boyamo Sali, led a delegation to Rome in November 1975 to accept Papua New Guinea's admission at the 18th session of the FAO conference.

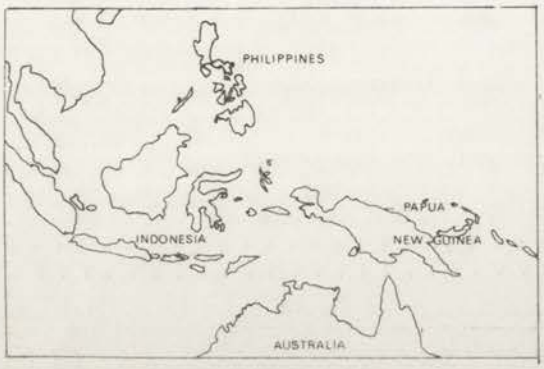
Mr Sali said FAO was carrying out technical aid programmes to the total value of K500 000 in PNG.

Papua New Guinea is anxious to play as full a role as it can in FAO, Mr Sali said.

DUCK RAISING IN THE PHILIPPINES

By Kup Manape, Rural Development Officer, Kindeng

The Philippines are a group of islands to the north of Indonesia, with a similar climate to Papua New Guinea. Most crops which grow in the Philippines will also grow in Papua New Guinea, and many of their agricultural problems are similar to ours. For this reason, the agricultural methods used in the Philippines are worth studying to see what new ideas we can introduce to this country. Mr Manape has recently returned from a fact-finding tour of the Philippines.



Duck raising is an old and well-established industry in the Philippines. Ducks are raised in the same way as chickens on both large and small scale for both commercial and personal use. Duck raising was believed to have been first introduced to the Philippines by early Chinese traders. The centre of duck raising in the Philippines is a place known as Pateres which is south-east of Manila and from there it has spread to all parts of the country. Ducks can now be seen in many parts of the country and their popularity and economic importance are second only to chickens.

Duck raising is a prosperous business and there are plenty of opportunities open to farmers who wish to go into this kind of business. Like here in PNG, ducks were first raised in the Philippines for meat purposes, but today most duck raisers are involved in egg production. Compared with eggs, little duck meat is consumed. Ducks are sold for meat as culls or boilers. Another branch of the meat industry is known as green ducks or what we would call broilers. These are male ducks raised up to 10 weeks of age and then sold for meat. Since the egg industry requires only a few males for breeding, the rest of the male ducklings are sold out to farmers at low prices for this purpose. The meat is more tender and much preferred to boilers.

As mentioned most income derived from duck raising is from eggs. According to farmers duck raising is a profitable business and it is stimulated by the heavy demand for duck eggs in the market. Duck eggs are treated or prepared in two main ways. They may be sold as "balut" (incubated duck egg with premature embryo) or "penoy" which is salted egg. This type is also referred to as red eggs due to the pinkish or reddish colour of the shell after it has gone through salt treatment. Both are popular in markets all over the country.

Location

Ducks being semiaquatic animals, the most natural places where ducks can be raised are near streams, canals and other open bodies of fresh water where they can swim and feed on freshwater snails. However, ducks can also be seen raised in areas where there are little or no natural streams or ponds. In such cases a little artificial pond is helpful. Farmers dig a small pond within the duck yard so that young ducks can swim during the day.

Ducks also require much green feed. They feed on the rice stalks and leaves and other green feeds near the farm. Green feeds may be chopped and fed to ducks the same way as we feed our chickens here with leucaena leaves. They also consume a lot of green leaves etc. during their daily walks in the mornings and afternoons when it is cool.

Unlike chickens ducks can live in water or muddy conditions.

Breeds of ducks

There are two main types of ducks raised in the Philippines. They are raised either for meat or eggs or both. The two breeds that are most common are known as Indian Runnar and the native duck. Both breeds are used for egg production and are good layers. They lay about an average of an egg per day. There are also quite a few breeds of duck which are of lesser importance. Muscovy ducks are raised on subsistence level mainly as pets. A few of them are also mixed with the egg-laying breeds as watch birds, since they will sound

Disabled man tending a flock of ducks at roadside.

the alarm if strangers or intruders come to the farm. Peking ducks are also quite popular and are raised mainly for meat. The Muscovy breed of duck is also raised for meat by poor farmers. This is because this type of duck can live practically on its own.

Housing

Ducks raised by the average farmer are usually kept in a small A-shaped nipa and bamboo house. Roofs are either grass or iron. On the floor there is usually rice hulls, cut-up bits of rice stalk or grass, or some farmers even use sand. This flooring material is to mix with the manure and prevent bad odour and also makes it easier for cleaning. The litter may be changed once or twice a year or when one batch is culled or sold out. The house is built near a pool or a canal or a small river so that the ducks may swim and wade around during the hot part of the day. In areas where there is no natural body of fresh water available the farmer may dig a small pond instead. To keep the flock in, a yard is generally erected which may extend right to the pond.

Purchase of ducklings

All small farmers purchase their ducklings from established hatcheries when the ducklings are about a day old. From these hatcheries farmers are able to obtain the best ducklings and according to some of the farmers mortality rates are quite low compared to chickens. Farmers place their order a week or two beforehand so that the hatcheries have enough time to get prepared. Ducks may be delivered to the farmer or the farmer may personally collect them. Whatever the case it is quite easy and convenient due to the wide range of transport facilities available plus excellent roads.

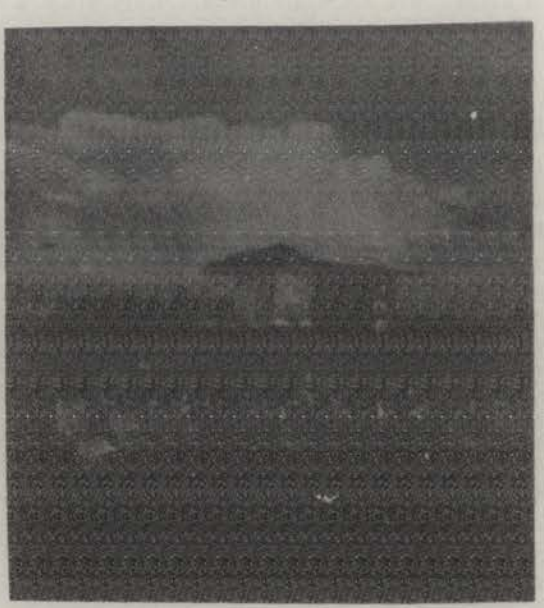
Management practices

Separation of sexes

Ducklings are separated into two groups, the male and female, at the age of two to four days. It requires a lot of practice to be able to distinguish the two sexes. After the separation only one male per ten females is allowed in most farms and the rest of the male ducklings may be raised for meat. The males are required here for the purpose of the production of the "balut" which is a fertilized, incubated egg. If some sexes were mistaken, this can be remedied when the birds are a bit older by distinguishing certain feathers on their tails.

Care for ducklings

Like chickens, for the first couple of weeks of life the ducklings are very delicate. Special



Flock of ducks with their tender outside a duck shed.

care is taken at this stage and enough space is provided per bird to prevent overcrowding. Frequent and regular feeding is also required, even at night.

Just as for chickens, a special brooding house with kerosene lamp and rice hull floor is provided.

Management or care of ducks

Ducks are quite simply managed. Ducks are turned out during the morning and someone manages or tends the flock. Usually a young boy or an old man takes this job. When the birds are out then the owner can collect the eggs and clean the place. The ducks sometimes lay eggs outside, so the watcher keeps a lookout for them. When the sun is hot the ducks are taken back to the house and allowed to rest. Then in the afternoon when it is cool, they are led out to pasture again until late in the afternoon.

Feeds and feeding

In the Philippines, since people may have very little money, most simple farmers try to make use of locally available feeds as much as possible. The common farmers rely mainly on freshwater snails as a source of protein for the ducks. These may be plentiful in rice paddies during the rainy season and are plentiful in any body of fresh water. For the source of energy or carbohydrates, grain feeding is common. Grains may be in the form of rice or corn. These are fed during the morning, lunch and in the afternoon before they go to sleep. With young ducklings they may be fed four times a day in some places or by some farmers. During the cool part of the day the flocks are taken out to the fields so that they may have free access to snails, grains, green feeds and insects etc. As mentioned, ducks like a lot of green feed and this may be chopped and fed to the ducks, or they may have access to it when they are taken out.

In any common farm from 50 to 500 birds may be found. With larger flocks, two or more people may be required to pasture them. It was observed that young boys, old men or disabled persons usually do this chore.

Freshwater snails as a source of protein may be collected daily, even if the farmer has to go some fair distance to do so. This is one of the main reasons for the need for availability of areas of fresh water. However, a large number of farmers are also using shrimpmeal, fishmeal and even meatmeal and poultry rations.

It is most important that farmers also provide a lot of fresh drinking water with the feed. This is given in bamboo troughs or water cans.

Conclusions and recommendations

As mentioned duck raising is a prosperous business on a small scale as well as on a large scale. Here in Papua New Guinea we have lots of places suitable for this industry. Even in the highlands, ducks can be comfortably raised in the drains or in areas near fish ponds, creeks or any bodies of fresh water. Duck raising should not be looked upon only as a source of getting income but also as a means to supplement inadequate protein diets.

Unlike chickens, ducks seem to be hardy and can survive in some conditions that could be unsuitable for chickens.

At present the price of frozen poultry meat is very expensive and village people have very little excess poultry to eat. If ducks could be locally raised there could easily be an excess of duck meat to eat and people could get meat at a cheaper price.

The other industry is the production of duck eggs. With the help of qualified technical staff, possibly from the Philippines, I think we could easily learn the techniques used in the Philippines for duck raising. Our country is young and agriculture is the backbone of this country, so we must try all sorts of new agricultural ways to be self sufficient.

Therefore to conclude I can say that this could be a prospective industry in the future for our young nation.

BREWER'S GRAINS IN PIG RATIONS

By G. L. Malynicz, Senior Veterinary Officer, Tropical Pig Breeding and Research Centre, Goroka

Brewer's grains are used for feeding pigs around Port Moresby. This experiment indicates that brewer's grains are a useful cheap source of protein for pigs.

Brewer's grains are a waste product from breweries. They are derived from the fermentation of barley in the manufacture of beer. They are quite rich in protein, but also quite high in crude fibre, which restricts their use.

It was decided to investigate the growth of pigs with brewer's grains as part of the protein content of pigs' rations.

Three groups of pigs were each given different rations. All the rations contained the same amount of protein, vitamins, minerals and salt. One ration contained only protein concentrate, and the other two contained 15 % and 30 % of brewer's grains, as part of their protein content (see *Table* 1).

Table 1. Composition of rations used

Ingredient	*% of brewer's grains*		
	0	*15*	*30*
Sorghum (kg)	77	65.5	54
Protein concentrate (kg)[1]	23	19.5	16
Dried brewer's grains (kg)	0	15	30
Vitamin-mineral (g)[2]	0	33	66
Salt (g)	0	143	277
Bone ash (g)	0	440	880
Estimated crude protein %	19.12	19.24	19.34

[1]Provincial Traders Pty Ltd, Brisbane, Queensland.

[2]Chemical Resources Pty Limited, Artarmon, NSW.

There were seven pigs in each group. The amount of food eaten daily was measured and the pigs were weighed weekly. The experiment lasted 129 days.

Results

The growth performance of the pigs is shown in *Table* 2. There was little difference in the results on the three different rations. The highest level, 30 % did result in a lower growth rate. This was mainly because the pigs ate less of this ration.

The cost of brewer's grains is nominal, as they are a waste product. The cost is almost entirely the cost of transportation. It is apparent from this experiment that brewer's grains are an attractive proposition for inclusion in pig rations, at least at levels up to 15 %.

Table 2. Growth of pigs on different rations

Level of brewer's grains	*Initial weight (ng)*	*Daily feed consumption Tkg)*	*Daily weight gain (g)*	*2Feed conversion ratio*
0	12.0	1.10	246	4.51
15 %	11.2	1.09	257	4.52
30 %	12.1	0.89	201	4.52

For further details of this experiment please write to the author.

FLOUR AND STOCKFEED INDUSTRY FOR PNG

A new company, Associated Mills Limited, will establish a flour mill in Lae, within the next 18 months. This will be followed about one year later by a second flour mill in Port Moresby.

The flour mills will purchase wheat from overseas, mainly from Australia.

Flour milling produces the important by-product of bran and pollard which is normally used for stock feed. A stock feed mill is also included in Associated Mills' plans. Stock feed mills will be established in Lae and Port Moresby at the same time as the flour mills. The Lae stock feed milling company will be a merging of the Associated Mills' interests and the existing Kaiani Feed Mills Pty. Ltd.

A Queensland company, Gillespie Bros Holdings Ltd, is the majority owner and manager of Associated Mills. Gillespies have wide experience in the stock feeds industry.

NORTHERN PROVINCE

By Michael A. Oata

Michael Oata is Provincial Rural Development Officer for the Northern Province. He has been in the position for about a year, although he previously had 6 years as a field extension officer there, from 1964-70. Before becoming PRDO at Popondetta, he was PRDO Kerema, and he has also worked at Daru, in the Western Province, and Cape Rodney in the Central Province. Born at Bereina, in the Central Province, he received his education at Yule Island, and then went to the Popondetta Agricultural Training Institute. While with DASF he has visited Australia and Malaysia. He is 32 years of age, and he and his wife Amy have three children.

Michael Oata

The Northern Province is situated 9° south of the Equator, with a coastline of 320 km on the Solomon Sea. The boundary of the province borders with the Morobe Province in the north, follows the Waria River up to the foothills of the Owen Stanley Mountains, then follows the main ridge of the Owen Stanleys in a south-easterly direction to where it borders with the Milne Bay Province in the south-east.

It is estimated that of the total area of the province, of 20 700 sq km, approximately 15 % is good arable land, 14 % marginal and the remaining 71 % is mostly unusable, being either steeply mountainous or swampy. Of the arable land about half is of volcanic origin and is very fertile.

Present agricultural development is concentrated in the Kokoda Valley (180 to 365 m), Saiho area and Popondetta plains. Other areas with good potential for development are the alluvial terrain of the major rivers, the sparsely populated Ioma-Waria area, the Musa area, and the Managalasi area (914 m).

Of the arable land available, it is estimated that 4.5 % of this is planted to cash crops (half of this is abandoned plantations), 1.5 % subsitence crops and 0.5 % is used for cattle farms. In addition, 2 % of the marginal land is used for cattle grazing.

Seventy-five per cent of the marginal land is either grass savannah or forest.

Rainfall distribution is fairly even throughout the province with some areas like Kokoda, Managalasi, Saiho and Ioma at times getting more than their fair share. The average annual rainfall is 2 286 to 2 540 mm of rain per year, falling mainly in the "wet season" from September to May. The hottest months are from June to September with July and August being the driest months. Some coastal areas sometimes have a dry spell in July to August, which due to the sandy nature of the soil leads to subsistence crop shortages.

A good all weather road links Oro Bay to Popondetta and Kokoda and has feeder roads into the villages and settlement blocks. It is possible that the present road connecting Oro Bay, Managalasi and Safia could be eventually extended to Abau in the Central Province and then to Port Moresby.

The main airstrips are at Girua (near Popondetta) and Kokoda. There are nine other smaller strips throughout the province.

Oro Bay has an overseas wharf and Killerton and Tufi both have small ships wharves.

Radio and telephone communication is not very relaible. Although Popondetta has STD, channels are overloaded. Radio communication within the province is also inadequate.

All areas of the province are accessible either by air, sea or road. Heavy rain however may close down roads and airstrips for weeks at a time.

People

Total province population in 1973 was 61 303 people with birth rate and death rate of 3 and 4 per thousand respectively. Manpower availability is good as there are not so many young people leaving the province as one would expect. This could be because there is plenty of land available for development and this may encourage the young people to stay and work the land.

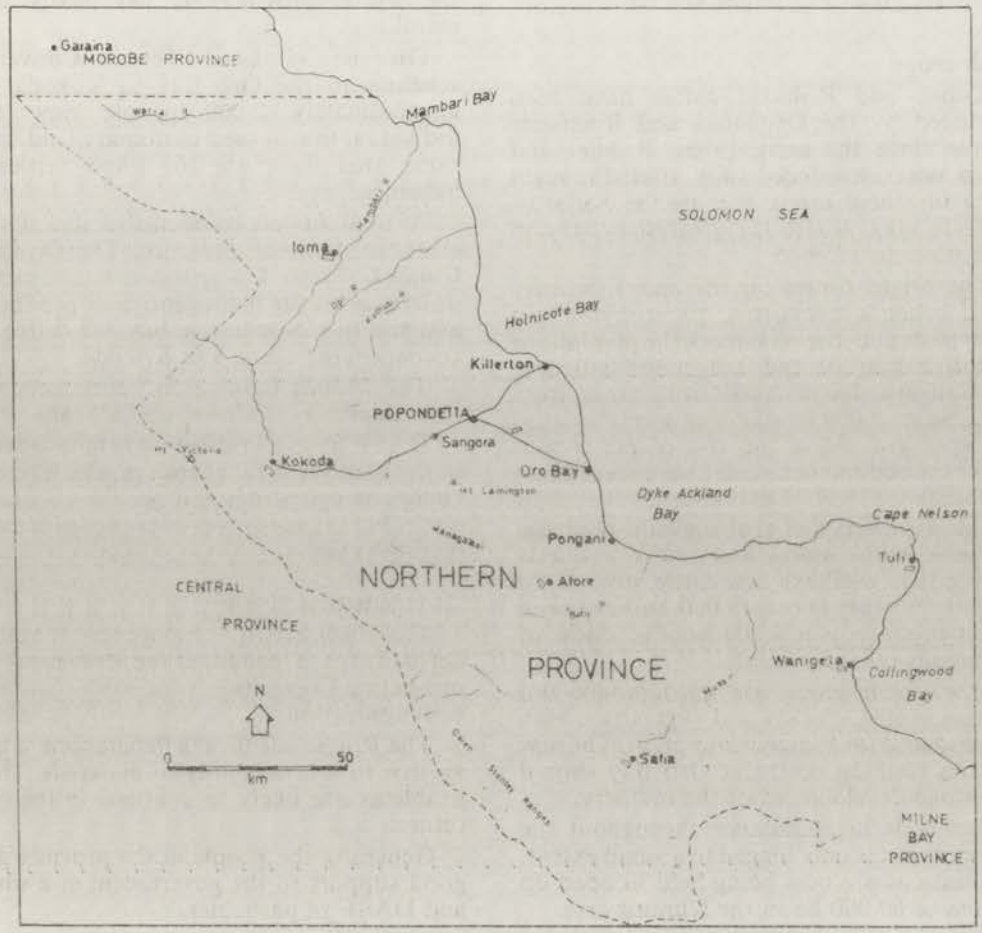
There are between 15 and 20 ethnic groups in the province. The largest would be the Orokaiwa and Binandele group with affiliated language groups on the borders of these areas. This group would cover the Popondetta, Kokoda and Ioma areas and perhaps 75 % of the population. The Tufi and Musa areas have many small groups. For example, 3 000 people in Collingwood Bay have three distinct groups—Maisina, Korafe and Ubir.

The main religion is Anglican with some SDA, Catholic and United Church missions.

Sorcery is practised and feared in Tufi, Wanigela and the more remote parts of the province, but only concerns a small number of people and has little effect on general behaviour and development.

The people generally take a positive and responsible attitude towards social and economic development. Land disputes are rare and usually are directed towards government-owned land.

There are 65 primary schools, 4 vocational centres and 2 high schools plus 1 skulanka in the province. Some school leavers tend to drift around, particularly those living close to the main centres but most are taking part in some form of agricultural development in their villages.



The Popondetta Agricultural Training Institute (PATI) was opened in 1963 and currently turns out 80 graduates a year. This institute was the first of its kind in Papua New Guinea.

All vocational centres undertake some form of agriculture. The projects include livestock and vegetable farming. In fact all schools carry out projects in their schools, mainly vegetable growing.

The people are generally healthy but in the more remote areas the effects of lack of nutritious foods such as meat, fish or green vegetables is noticeable. The Department of Public Health is now taking action in trying to teach the people to eat more nutritious food. Adequate health services are provided through the main hospital at Popondetta and at other centres throughout the province.

The staple diet is mainly taro and sweet potato, supplemented by bananas, yams, pumpkin, green vegetables and corn.

Cash crops

Copra and Robusta coffee have been produced by the Orokaiwa and Binandele people since the early 1930s. Rubber and cocoa were introduced soon after; the main areas for these crops became the Saiho to Kokoda area, where the greatest expansion took place in 1959-65.

The bright future for the cocoa industry faded when armyworms, pantorhytes and other pests and diseases struck the plantations of both expatriate and indigenous settlers in the Sangara, Isivini and Girua areas from 1960. Some 3 000 ha of cocoa were damaged or destroyed. Most of the planters went bankrupt and the remainder were forced into a subsistence level of existence.

Cattle is a very fast-growing industry in the province with more and more requests coming in to establish new cattle projects. In the last 10 years about 10 000 ha have been fenced to graze over 4 000 head of cattle, in indigenous-owned projects.

Other cash crops are cardamoms and Arabica coffee, chillies and vegetables. Fish are produced for local consumption. The new fisheries training centre at Oro Bay should encourage development of the industry.

Timber is in abundance throughout the province, but is only logged to a small extent. Negotiations are now being held to open up an area of 60 000 ha in the Kumusi area.

Tourism is developing slowly in the Tufi fiord area, associated with the tapa cloth industry at Wanigela.

There is potential for wildlife development, particularly crocodile farming and, on a small scale, butterfly farming.

Business

The Papua New Guinea Banking Corporation has a main branch at Popondetta with agents at Kokoda, Ioma, Afore and Tufi. The Papua New Guinea Development Bank is represented in the province and is mainly concerned with village cattle projects. There is also an agent of the Bank of New South Wales at Popondetta and Wanigela. Burns Philp and Steamships with seven other smaller stores are established in Popondetta.

Eight small village Savings and Loans Societies have amalgamated to form one for the whole province. It has nearly 6 000 members.

On the 31 Land Tenure Conversion schemes in the Oro Bay to Kokoda area approximately 2 000 people now have individual title to their customary land. In the same area there are 267 Land Settlement Schemes.

A total of ten co-operative societies are established in the province. The Orokaiwa Coffee Growers' Co-operative handles coffee purchases in the main centres of production and the Iji Co-operative buys all coffee and cocoa around Ilimo and Kokoda.

The Mount Lamington Fermentary near Popondetta buys all wet cocoa beans.

DASF buys all rubber and chillies (except in the Kokoda area where a private buyer for chillies is operating) and provides a market outlet for any cash crop where no commercial facilities exist.

Government activities

Co-operation between various departments is good and the Provincial Co-ordinating Committee is the main channel of communication.

The Provincial Works Programme is held up due to unavailability of materials. These problems are likely to continue in the near future.

Generally the people in the province give good support to the government as a whole and DASF in particular.

Missions

The dominant mission is the Anglican Mission. Missions have had a very strong influence on the development of the province. They provide a high standard of education and medical services throughout the province as well as teaching agriculture and helping the village people in their projects.

Self-help groups

Most of the groups are village action groups organized with the idea of developing their areas both economically and socially. Some groups are politically oriented as well.

There are 21 Youth Clubs, which are engaged in livestock projects, trade stores, social functions and help the village communities in economic activities.

There are 17 Women's Clubs which engage in basket weaving, sewing, cooking and at times hold social functions.

There are real leaders of both sexes in these clubs and they organize their club activities well.

Political

The province has six Local Government Councils—Cape Nelson (Tax K8), Ilimo (K8), Afore (K5-K7), Higaturu (K10), Tamata (K7-K8), and (Oro Bay K8 men, 50t women). Oro Bay Council is the only one where women pay tax.

There are three electorates—two open, Ijivitari (Sergius Arek) and Sohe (Stephen Tago, Minister for the Environment and Conservation), and one regional (MacKenzie Daugi). MPs assist DASF with gathering information particularly from the more remote areas. MPs place a lot of emphasis on agricultural development in their meetings with the people.

There are several political or pressure groups in the province. The two biggest ones are Kapit and Ada. The Pangu party dominates throughout.

The Northern Province Area Authority was formed in 1972. The present president is Edric Eupu and vice-president is Bretherton Ombora. The Area Authority is closely involved in the planning of agricultural development in the province, and has allocated K25 500 to agriculture for the present financial year.

PRDO Michael Oata presenting his Provincial Agricultural Development Programme to the Area Authority meeting in Popondetta.

AGRICULTURAL DEVELOPMENT PROGRAMME

DASF has been preparing programmes for many years and these programmes have ranged from the very complex to the fairly simple. The ones that are now being prepared by PRDOs are the type of programme which the government requires for budgeting purposes, evaluation of staff activities, and also to provide information to other interested authorities such as the Papua New Guinea Development Bank, World Bank, consultants and so on.

Cattle

Throughout the province cattle farming has been very well taken up by the people, mainly in the Popondetta, Kokoda and lately Tufi subprovinces. There is a lot of potential for development of the cattle industry. People have realized this and are now pushing towards achieving this.

Total indigenous cattle projects at the end of 1975 were 211 with a total herd of 4 600 cattle. These projects are financed by PNG Development Bank loans, and repayments are up to schedule.

Indigenous beef production for the market was 15 508 kg for the year 1974-75.

Total expatriate-owned cattle number 2 750 head with another 600 head belonging to DASF. Production last financial year was 71 077 kg.

Approximately 60 tonnes of beef a year are now exported from the province; 30 tonnes are consumed locally.

There are slaughtering facilities at Kokoda (Mamba Pastoral Co.) and Popondetta (PATL).

The Anglican Mission has cattle projects at Popondetta and at Saga in the Kokoda area. The Catholic missions at Asimba and Jombai help the villages by supplying them with cattle and barbed wire for their projects.

In 1975, 14 new projects were stocked with 220 head, in the Popondetta and Kokoda areas. For 1976, 4 new projects of 60 head each are planned for Kokoda, 5 of 70 head each for Popondetta, and 3 of 30 head each for Tufi.

Investigations will be carried out in 1976 for possible new projects as follows: 3 at Managalasi, 5 at Tufi, 3 at Kokoda, 3 at Ioma and 4 at Popondetta.

In the long term, it is possible with the development of the Musa grassland potential and natural increase on existing projects that cattle numbers in the province could be doubled by 1980. With the increase in cattle numbers the industry could be worth K500 000 by the end of 1980.

Extension officers are carrying out a programme to establish improved pastures on indigenous-owned projects. In 1975 improved pastures were established on four projects in the Popondetta area. In 1976 it is planned to complete four more 12½ ha projects in the Popondetta area, plus ½ ha each on the following projects: 40 in the Popondetta area, 30 in the Kokoda area, 5 in the Musa area and 3 in the Tufi area.

Mimosa pudica, a legume which was originally introduced to the province as a cover-crop in rubber plantations, has become a troublesome weed in the province. It covers large areas of land which could be good cattle grazing land. Cattle will not eat it because of its thorns, and its vigorous growth quickly kills useful pasture plants. Research work into biological control of this menace has not had any success so far.

Tests were carried out in the province in 1975 to find out the cheapest method of control, and it was found that slashing combined with spraying was the cheapest method. The control programme will begin in 1976. After the mimosa is killed by spraying, new pasture will be planted immediately.

Farmers will be encouraged to use a rotational grazing programme so that weeds will not become a problem in pastures. Lack of understanding by farmers at present contributes to weed problems in pastures.

Training for farmers is continuously carried out, both by field extension officers and at special training schools. In 1975, 7 farmers from the Popondetta area attended a Farmer Training Course at Bisianumu. There were also field days at Mamba Estate for the benefit of cattle farmers in the Kokoda and Popondetta areas.

In 1976, 5 farmers from the Musa area, 3 from Tufi and possibly 3 from Ioma are expected to attend the Bisianumu training course. For the benefit of all farmers two field days are planned for Mamba and two at PATL.

Training for farmers is a continuing part of DASF's extension effort.

Members of the Northern Province Area Authority and Michael Oata visiting a cattle project.

Other plans for the development of the cattle industry include improved slaughtering and marketing facilities.

The Northern Province Cattle Farmers' Association is establishing a butcher shop with a coolroom at Popondetta, in 1977-78.

It is planned that coolroom facilities available at PATI will be doubled in 1978-79. The possibility of a co-operative owned central abattoir by 1980-81 will be investigated.

It is hoped that the Northern Province Cattle Farmers' Association will be able to take over most of government responsibility for the development of the cattle industry, by 1978-79. The government will continue to provide veterinary and research services.

Coffee

Robusta coffee is grown in the lowland areas of the province and Arabica in higher areas. It is estimated that there are 960 ha of Robusta and 195 ha of Arabica. Production in 1974-75 was 525 tonnes of Robusta and 75 tonnes of Arabica.

Owing to low prices, there have been only small plantings in recent years. The total area of coffee is therefore almost entirely mature trees.

There are about 7 000 families growing coffee.

Owing to lack of enthusiasm on the part of growers, a planned increase in area planted to coffee has not been achieved, although an increase in total production was achieved in 1974-75.

Four Arabica nurseries have been established at Biagi in preparation for new plantings there.

More trees are being planted by the people mainly in the Wawonga, Managalasi and Kokoda areas. Officers of the Department have also started teaching people to rejuvenate old plantings.

In 1975 replanting of Tufi cyclone losses was partly achieved, and this will continue during 1976.

Six 37 sq m nurseries will be established at Wawonga and lower Chirima during 1976.

DASF will continue to encourage new plantings. There is little interest shown in expansion in main areas, but more interest in remote places. Increased price could result in new plantings.

Improved storage facilities have been built at Tufi, and 8 pulpers will be obtained for the Tufi area during 1976. New buildings are planned for 1976 at Ioma and Safia.

From 1978 consideration should be given to establishing a central coffee mill in Popondetta, to save shipping costs to Lae. This would improve the price paid to growers.

There are two main coffee buyers in the province. The Orokaiwa Coffee Growers' Co-operative handles coffee purchases in the main areas. The Iji Co-operative handles coffee and cocoa purchases around Ilimo and Kokoda.

DASF buys in the Ioma, Tufi and Safia areas. A new buying point will be set up for Wawonga in 1976.

The parchment standard is good, and growers are generally familiar with crop culture and processing.

Longterm increases in planting and production will very much depend on the world coffee prices.

Rubber

There are 600 growers in the Kokoda area, 300 in the Saiho area and 150 in the Popondetta area. The total area planted to rubber in the province is 309 ha. The main areas are Kokoda and Popondetta. Two hundred ha at Kokoda are mature rubber, and 88 ha of new plantings are immature. In the Popondetta area there are 73 ha of mature rubber, and 28 ha of immature plantings.

The total production for 1974-75 was 200 tonnes.

There is interest showing in the Kumusi and Kokoda areas and steps are being taken to open more new trees in these areas. Twenty new blocks were opened in the Ilimo area in 1975.

Expatriate plantations at Kokoda and Mamba are tapping, but plantations at Awala, Sangara and Wijo have been abandoned.

These could be re-opened by the government if the price is economic. The government purchased Igora plantation in 1975, and DASF is supervising harvesting and processing.

The main activity in the province is now to plant high-yielding rubber. A Malaysian bud-grafting expert will be visiting the province in January 1976 for 6 weeks to train staff and farmers in bud-grafting techniques.

New nurseries of ordinary seed are being established, and buds of high-yielding rubber will be grafted onto these plants. A nursery has been established at Kokoda and another is planned for 1976.

Tapping of 28 ha of new rubber is to commence in Popondetta land settlement schemes and land tenure conversion areas, in 1976.

Approximately 500 abandoned blocks at Saiho and Sangara could be reopened in 1977-78, if prices permit. This will be combined with reopening of abandoned expatriate plantations, which will provide processing facilities under the nucleus estate system.

In 1975 new factories were built at Hamara and Haki.

The creping machinery at Igora plantation is now available to process cup lump and polybag lump for the whole province. In 1981 the Ombisusu syndicate may convert to crepe production machinery.

Smoked sheet is purchased from village factories by DASF. The Ombisusu syndicate is preparing to take over buying from DASF in 1978-79. If first moves are successful, a complete takeover is expected by 1981. The syndicate will need trucks to collect the rubber at the village and take it to the baling centre.

Supply of acid for processing has been a problem in some areas. DASF aims to remedy this problem in 1976.

Cocoa

There is not very much activity in this crop, especially where the armyworm and pantorhytes attacked the cocoa in the Sangara land settlement scheme. Whatever is left is still being harvested. Understandably, the village people do not show much interest in this crop.

Area of village plantings is 810 ha. Area of land settlement schemes is 226 ha. Of the total area, 643 ha is mature, and 150 ha immature.

Total production in 1974-75 was 272 tonnes, although a potential production of 350 tonnes has been estimated.

Approximately 300 ha need replanting, as trees are over 20 years old.

Although the problem of pests and diseases is still important in the province, growers are being encouraged to plant dieback-resistant clonal cocoa, which gives a stronger tree more able to withstand attack by pests and diseases. This combined with pest control practices recommended by the Entomology Branch of DASF will enable the cocoa industry to go ahead again in the province.

In 1975 DASF investigated pest and disease control in all areas, and responsibility for pest control is now with the growers.

Most interest in new plantings comes from the land settlement schemes at Sangara and Kokoda. Village plantings are static.

In 1975 4 000 clonal cuttings from the DASF research station at Lejo, and gliricidia shade, were distributed to interested growers. In 1976 the aim is to encourage planting of about 20 000 clonal cuttings to land settlement schemes at Kokoda and Sangara, and to land tenure conversions in the Popondetta area. In the next five years we hope to replace old plantings with improved clonal cuttings, to rejuvenate and expand existing plantings.

The possibility of a cocoa industry in the Collingwood Bay area will be investigated.

Improvements to fermentaries have been built at Ioma and Kikinonda and Iji will be improved in 1976.

Iji co-operative buys cocoa around Ilimo and Kokoda. Mount Lamington Fermentary handles all wet cocoa beans. DASF buys elsewhere.

Coconuts

Coconuts are planted throughout the lowland areas of the province, but only a small proportion of the crop is processed for sale. Workload for copra production is unattractive to the coastal village grower, who generally is satisfied with a low cash income.

The quality of copra produced is fair, being either smoke-dried or sun-dried. DASF aims for this crop include an intensive promotion and propoganda campaign to encourage people to harvest more nuts and produce better copra with Ceylon type driers.

In 1975, 5 driers were completed, between Bakumbari and Pongani. Four more Ceylon type driers are planned for this area in 1976. In the next five years, DASF will aim to erect Ceylon type driers and hot air driers wherever requested.

As a rough estimate, there are 2 300 ha of coconuts in the province. There is one expatriate plantation of approximately 100 ha.

In 1975, village production was increased from 62 to 70 tonnes per year. Production aim for the next five years is 100 tonnes per year.

Three new nurseries were established at Keppel Point, and palms damaged at Tufi by the cyclone were replanted.

Aims for 1976 include expansion of existing gardens at land settlement schemes at Keppel Point and Wanigela and replacement of dead palms at Cape Nelson (all in the Tufi area).

Marketing of copra is partially handled by co-operatives. A complete transfer is aimed at for 1976.

Chillies

People show a keen interest in this crop and are rapidly increasing their plantings. Women and children do 95 % of the work. Both soil and climatic conditions favour this crop. Because of the high value for weight, chillies are ideal for remote areas. If prices remain good, present rate of expansion will continue.

The quality of the birds-eye chillies from the Northern Province is high, due to strict control by DASF field extension workers.

The main production areas are Kokoda, Managalasi and Musa. Total area is very difficult to estimate as it is combined with subsistence gardens. However, production for 1974-75 was 100 tonnes. Average price was 57 t per kg.

All produce is purchased by DASF, except in the Kokoda area. In 1975, marketing and storage facilities were improved at Safia and Namudi. The marketing outlet at Kokoda will be improved in 1976, and new marketing and storage facilities will be provided at Awala (Musa area). Hot air driers could be required in wetter areas such as Wawonga and Managalasi.

Provided the price level is maintained, expansion will continue in existing areas. Within two years, Ioma and Tufi could be more involved in chilli production.

Fishing

Hardly any fishing is done at all, except for local consumption. With the establishment in 1975 of the fisheries base at Oro Bay, with boatshed, accommodation, freezer and store, it is hoped that more interest will be shown by the people towards fishing for cash.

In 1975 a fisheries shed at Tufi, and a smokehouse at Oro Bay were also completed. An ice-making machine was installed at the end of the year at the Oro Bay fisheries centre. Another smokehouse is planned for Pongani in 1976.

Production from Oro Bay during 1975 was 300 kg, for the Popondetta market. Six

hundred kg of smoked fish was sold at Oro Bay.

There is also a privately owned freezer at Tufi, but local conflict is retarding development of the industry there.

DASF now has two boats, although one is awaiting repair. With these two boats operational, ice delivery from Oro Bay with a fish purchasing service will be extended to all interested fishermen, following the pattern of a similar service in the Milne Bay Province.

Increasing commercial fishing is then expected on the north coast, Oro Bay, Pongani, Tufi and Wanigela.

Two fisheries training courses, both for village fishermen and for government officers, were held in 1975, and eight villagers were given continuous training at Oro Bay. Training and assistance will continue to be given to all fishing groups or individuals interested in commercial fishing.

The possibility of installation of a freezer at Wanigela will be investigated.

Six ponds at Kokoda were prepared and stocked with tilapia during 1975.

Trout fishing at high altitudes could become a tourist attraction, and it is planned to introduce trout to Wawonga and Managalasi in 1976.

Vegetable

A large quantity of vegetables, mainly local types, is sold at local markets. Since the Fresh Food Project commenced buying in late 1974, a total of 123 tonnes was purchased in 1974-75. Very small quantities of European-type vegetables are grown, mainly in the Kokoda and Managalasi areas. Seeds are being distributed to these areas. Production purchased during 1974-75 was 735 kg.

All main centres have small local markets and usually hold this on one day of the week. Popondetta town market operates 7 days a week. Kokoda market operates once a fortnight.

Increased production of European vegetables will be encouraged by DASF, to provide supplies for Popondetta. A vegetable extension officer of the Department will visit all outstations to advise farmers and provide seed.

The Department also aims to improve and increase vegetable supplies for all outstations, particularly for Tufi, Afore, Ioma and Kokoda.

DASF now provides a purchasing service to all growers on the road linking Oro Bay to Kokoda. Vegetables purchased by this service are sold to institutions. As production increases, any surplus to local requirements could be sent to Port Moresby.

A market survey in Popondetta was completed in 1975, and a constant check will be kept on vegetable prices in all centres.

The aim is to maintain a steady increase in production of European vegetables to 10 tonnes and local vegetables to 300 tonnes by 1980. Possible limitations to the programme may be bad weather, insect or disease attacks, or shortage of seed.

Other developments

Wildlife. There is potential for wildlife development particularly crocodile farming. Investigations have been carried out at Musa and Kumusi areas, and development and training will be according to the village farmers' interest.

Three potential crocodile farmers will visit PATI crocodile training farm in 1976. Other farmers in the Kumusi and Musa areas will be encouraged to join the programme.

If the short-term crocodile programme is successful, it is anticipated that rapid expansion in crocodile farming will occur in lower Musa, Kumusi and Mambari areas. It is desirable that this industry be associated with fish projects, as the fish offal can be fed to the crocodiles.

Butterfly farming may be introduced to the Waria to Ioma area by 1978 if a pilot farm now being developed at nearby Garaina, in the Morobe Province, is successful.

Wildlife management areas will be defined according to the demand in the province. Rangers and other government officers will be recruited to protect and preserve the wildlife resources of the province.

Pigs. Three pig farmers with a total of 20 pigs have started projects. Encouragement and supervision will be given to these farmers, and to others who show interest. Farmers will be encouraged to visit PATI pig project so as to improve their management and feeding techniques.

Poultry. There is no commercial project. Village stock is being upgraded by introduction of stock from PATI.

The future of the pig and poultry industries in the Northern Province depends mainly on

the ability of the province to become self-sufficient in cheap foodstuffs—sorghum, maize, fishmeal and so on.

Cardamom. This is a relatively new crop and is only grown in the Managalasi area. Progress is slow, and with shortage of expert staff in the area, not much field work is done on this crop. There is one expatriate-owned plantation and some village plantings. Total area under cardamom in 1974-75 including Boikik plantation was 69.62 ha, with only 20 ha of indigenous plantings. Indigenous production was 272 kg.

DASF maintains two nurseries at Managalasi. A drier was built at Afore in 1975, and another is to be built at Kawowoki. Villagers are being encouraged to expand old gardens, and demonstrations are held on harvesting. Most of the buying and most of the advice comes from the expatriate plantation at Afore.

In the long term, expansion may be extended to Wawonga.

Rice. Seven trial village plots were established in 1974-75, but were wiped out by the insect pest leptocorisa. Investigations into the control of the insect are continuing.

Ginger. A plot of ginger has been established at Popondetta to provide planting material for village ginger production. However, there has been no demand from the villagers, who generally have their own ginger growing in food gardens. Development of this industry is awaiting advice on the market potential.

All of these small projects depend on the attitudes of the village farmer and world markets, which could change from day to day.

Redevelopment of Sangara Settlement Scheme

Planning is now well advanced for the redevelopment of the Sangara area where cocoa crops were devasted by pantorhytes.

This will take the form of a nucleus estate with smallholder and village oil palm development scheme along similar lines to the Hoskins scheme in West New Britain.

The nucleus estate of 4 000 ha will be developed by the Papua New Guinea government in conjunction with the Commonwealth Development Corporation. The World Bank has recently had a Mission in Papua New Guinea to appraise the project and it is hoped that it will approve a credit to assist government development of the proposed 1 200 smallholder and village blocks totalling some 5 000 ha.

If approved it is expected that oil palm plantings will commence in 1977.

EASTERN HIGHLANDS PROVINCE

By Cathy G. Haley

Miss Cathy Haley was Provincial Rural Development Officer for the Eastern Highlands up to the end of 1975. She was the first woman in DASF to hold a PRDO position. She came to Goroka from Brisbane in March 1972. In mid 1974 she was appointed PRDO, and she remained in that position until this year, when Mr Karo Vali took over as PRDO. Miss Haley is now with the Fresh Food Project in Goroka.

The Eastern Highlands Province consists of six administrative subprovinces. DASF has a seventh centred on Korofeigu.

South of the Bismarck Range the Eastern Highlands Province consists of grassland valleys of the Asaro, Bena Bena, Dunantina and Upper Ramu Rivers. This area supports most of the province's population. The altitude here ranges from 1 500 to 2 100 m.

The climate is uniform with cold nights and warm days. The temperature range is from 14° C to 30° C. The annual rainfall varies from 1 520 to 3 300 mm, and there is a distinct dry season from June to October.

Thirty per cent of the province is grassland. Light scrub on the foothills leads to dense forest in the more mountainous areas. There are about 47 000 ha of natural timber.

The total area of the province is 14 447 sq km. Only 1.2 % is suitable for all crops; a further 1.6 % is suitable for cropping with varying local limitations; 10.1 % is suitable for grazing, leaving 76.5 % unsuitable for agriculture.

It is estimated that of the total land available, 20 to 25 % is under active dispute and 60 % under latent dispute. This then makes it unavailable for commercial agriculture. Pressure on land must increase with population growth.

The road network is extensive. Those parts of the province lacking road access are the most thinly populated. In the south Marawaka subprovince there is air access only. Radio and telephone communication throughout the province is satisfactory.

People

The population is 264 200. Migration from the village is considerable, leaving the village work force short of young men.

Cathy Haley

There are 17 language groups in the province

Generally, education does not seem to have aided agricultural development.

There are 133 primary schools, 7 secondary schools, 1 skulanka, 1 senior high school (opening this year) and 5 vocational centres. The national secondary teachers' training college is at Goroka, associated with the University of Papua New Guinea. There is a school of nursing at Goroka.

People are keen to have children attend schools but are very unwilling to assist with land.

Sweet potato is the staple, providing up to 90 % of diet. Small quantities of tapioca, taro and yams are grown and normally provide food during time of shortage, at the end of the marked dry season. Sugar-cane, bananas, maize, edible pit-pit and a number of leafy vegetables are grown. Wing-bean, a nutritionally valuable plant, is grown seasonally below 1 700 m for its leaves, tubers and pods.

Major illnesses of the area are pneumonia and diarrhoea, the latter related to poor village water supplies. Malnutrition is a serious problem in the province, and is considered to be at least 27 % of the 0 to 5-year-old group.

Economy

Coffee is the main crop. Tobacco and fresh vegetables are exported from the province to the rest of Papua New Guinea. The beef cattle industry is growing, and should reach self-sufficiency in a few years.

Five coffee plantations have been purchased for local participation, and more are under negotiation.

Highland Weavers and Handcrafts is a successful business with K½ million turnover.

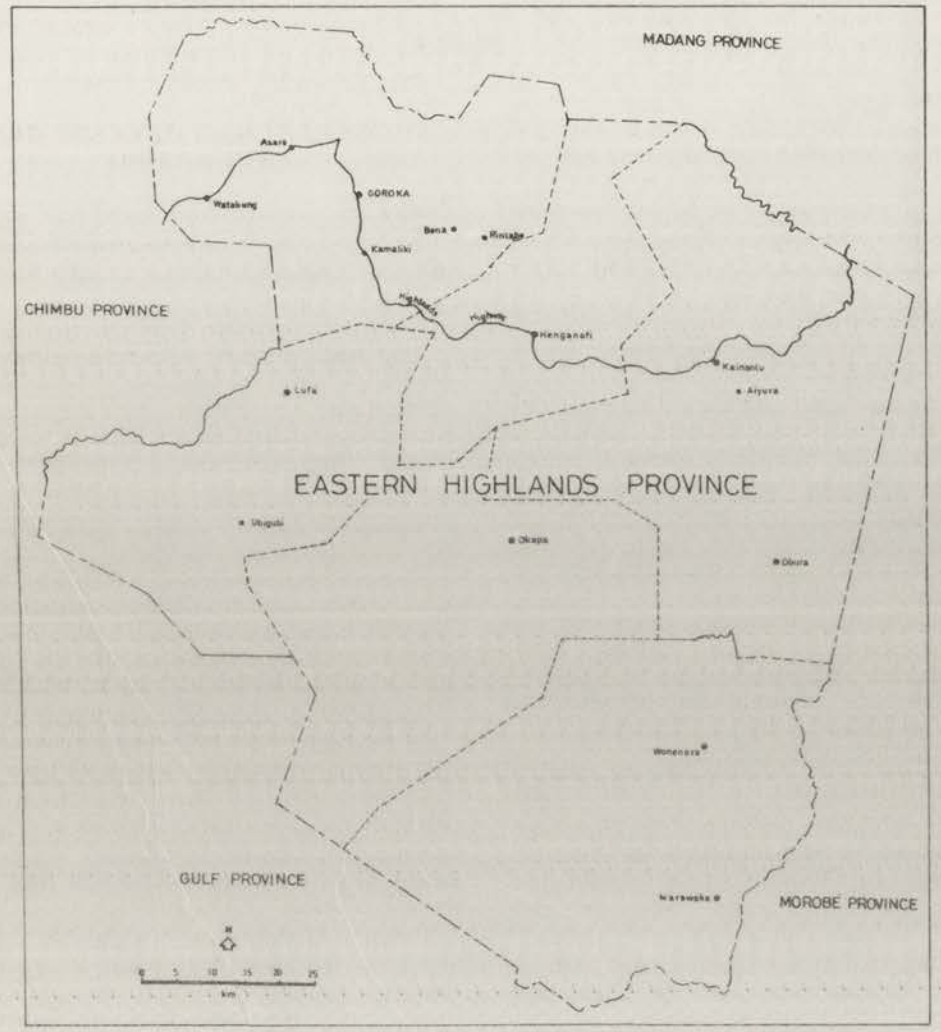
Ninety-five per cent of the Development Bank loans of the province are rural loans (compared with the Western Highlands where the majority are for hire purchase). The number of loans doubled in the last 12 months.

A popular form of investment is a business group under the Business Groups Act, where shareholders contribute capital for investment in medium and large-scale businesses. One group has accumulated K200 000 of assets in 12 months. Another group is at present considering takeover of businesses totalling K450 000.

One Savings and Loans Society exists, incorporating all old savings clubs.

The development of the Ramu Hydroelectric Scheme in the Kainantu area should lead to further development in the province.

Maximum development is associated with road systems and ease of marketing.



DASF branches

DASF has three research units in the province. These are: Tropical Pig Breeding Research Unit, at Goroka, Highlands Beef Research Unit, at Bena Bena, and Highlands Agricultural Experiment Station at Aiyura. Aiyura takes an important part in extension in the province, holding monthly field days directed at training both DASF staff and farmers.

Missions

Major missions involved in agricultural enterprises are the SDA, Lutheran and Swiss. The Summer Institute of Linguistics at Aiyura has a sawmill, cattle and involves itself with translations of local languages.

The SDA mission at Kabiufa and the Lutheran mission at Asaroka give agricultural education.

Self-help groups

As mentioned before, most groups are investment groups. Akepe Miakwe, MP for Goroka, is associated with one of these.

There are five farmers' clubs generally with emphasis on livestock producers. The President of the Area Authority, Ono Aia, is president of one such association, and the Minister for Culture and Recreation and MP for Kainantu, Moses Sasakila, is a member of the same group.

The Asaro-Watabung Rural Development Corporation is a growers' body associated with an expatriate plantation owner. It owns a coffee mill. Sinake Giregire, MP for Daulo, has been involved with this corporation.

Other groups are the Bena Tobacco Scheme, Ufeto Coffee Weed Control Scheme, and Lufa Women's Clubs.

The Kainantu subprovince has developed several meeting areas called Eria Communities. The Speaker of the National Parliament and regional member for the Eastern Highlands, Barry Holloway, has assisted in their development.

Community leaders

Other politicians not mentioned above are the member for Henganofi, Bona Asanifa, the member for Obura, Onamauta Beibe, the member for Okapa, John Pokia, and the member for Lufa, Suinavi Otio.

The foundation members of the Country Party are from the Eastern Highlands Province.

In addition to the politicians, there are a number of other traditional influentials: Nomi (Kainantu), Kopie (Goroka), Homate (Goroka), Igau Nasav (Kainantu Sonopi), Anarai (Kainantu Punano), Kutanama (Henganofi Gintinu), Eseyamo (Henganofi Yontebe), Bamba Namba (Lufa Degi), Aia (Lufa Kogoraipa) and Muriso Warebi (Okapa Miarasa).

There are eight local government councils, and their tax rates are as follows: Asaro Watabung (K4 to K10), Lowa (K8), Henganofi (K6 men, K2 women), Kainantu (K5), Lemari (30 t to K2), Lufa (K2 to K5), Okapa (K7) and Yelia (60 t).

The Area Authority is reasonably effective, and is beginning to become interested in agricultural developments.

The degree of political awareness is low in some sectors of the community, placing a heavy burden on the elected members.

AGRICULTURAL DEVELOPMENT PROGRAMME

Coffee

Coffee is the major cash crop. Production in 1974-75 was 980 tonnes of green bean (29 % of PNG production).

Sixty-five per cent of production is from 54 000 small holders, about one-fifth of the province's total population. There are 46 plantations, 3 owned by Papua New Guineans, 3 owned by councils, 3 by locally owned companies, and 2 with 25 % local equity.

There are 33 coffee mills, 10 of which are wholly or partly locally owned.

Present production is 199 000 bags, worth K5 750 000. Smallholder production is 129 000 bags, worth K3 715 000. Average production from smallholders is 150 kg per grower, giving an annual income of K69.

The price for green beans between October 1974 and September 1975 ranged from 48 t to 71 t per kg, with an average of 48 t per kg.

In recent years there has been little replanting and general disinterest in pruning and maintenance. However, there has been a recent upswing in production in line with increased prices.

Local Government Councils have allocated Rural Improvement Programme funds for training and employment of coffee "inspectors", who will promote improved

Members of the Area Authority discuss the Eastern Highlands Agricultural Development Programme with PRDO Cathy Haley. (From left to right: Yape Noruka, Momba Ombo, Doe Kafia, Cathy Haley.)

maintenance of coffee gardens in the villages.

During the next five years, a major objective is to maximize coffee production. Production from present plantings is to be increased, and abandoned and sterile plots are to be replanted.

In 1976 up to 30 % of staff time will be spent on coffee in most areas.

Marawaka plantings will be expanded by 40 ha.

Nurseries of the better variety Arusha will be established at Marawaka, Simbari, Wantakia, Wonenara, Obura, Frigano and Ubigubi, each about 16 sq m.

DASF staff will have in-service training on plantation management so that they may assist village people buying expatriate plantations.

A fall in coffee prices may affect the programme. Growers may also be satisfied with their present per capita income and may not support the programme.

The local government coffee inspectors will assist with explaining the importance of pruning etc. Local Government Councillors have been asked to show their appreciation of the importance of the programme by setting an example with their own coffee gardens.

If the coffee inspector programme is successful, the numbers will be increased in 1978, with fund allocation from Local Government Councils and the Area Authority.

In 1978 the anticipated smallholder production will have increased to 149 000 bags, and the Eastern Highlands total to 219 000 bags.

With on-going success of the programme, smallholder production should increase to 157 000 bags, 70 % of the anticipated 225 000 bag provincial total, by 1981.

Vegetables

The Eastern Highlands Province is suitable for vegetables. There are nine local markets (three with over 100 sellers).

Two marketing organizations, the government Fresh Food Project and the Lowa Marketing Co-operative, are mainly supplied by surplus production. There are annual gluts from April to July.

Most suppliers are smallholders, with six full-time local producers, and four expatriate including Kabiufa mission.

In 1975 vegetables exported from the province were 1 047 tonnes per annum. This included 510 tonnes of sweet potato. Twenty four tonnes of bananas, 13 tonnes corn, 227 tonnes pumpkin and 315 tonnes sweet potato were sold to government institutions in the province. An estimated 430 tonnes of sweet potato is sold through the Goroka market.

At least 10 vegetable farmers are providing reliable and continuous production. The marked dry season throughout most of the province prevents continuity of supply from other growers.

In 1976, present production will be maintained. In addition, 10 tonnes of seed potatoes will be imported for Kuru, Kesavaka and Kainantu areas. Small ¼ ha plots will be established for onion production in the Korofeigu and Bena Bena areas. Production of European leaf vegetables will be discouraged in favour of local leaf vegetables. If coastal areas increase production, local exports of sweet potato may fall to 125 tonnes.

After 1976-77, a quota system for supply of vegetables to the Fresh Food Project may be introduced, and this will possibly discourage further production above the 1976-77 levels.

Processing of vegetables is being examined as a means of overcoming problems of seasonal production. Freezing machinery is being tested.

A sweet potato drier has been installed at Goroka and will commence production in 1976. Eight Taiwanese sweet potato shredders will be purchased in 1976.

In 1975, Cottees Passiona (NG) Ltd withdrew from Papua New Guinea, and passionfruit purchase will be taken over by the Fresh Food Project. Export of passionfruit concentrate will be discontinued, but juice and frozen pulp will be manufactured for PNG consumption.

Tobacco

Two types of tobacco are planted, one for flue-cured and one for fire-cured tobacco. Flue-cured tobacco is used in cigarette manufacture, and fire-cured tobacco is used for twist tobacco, or sold in local markets. The majority of fire-cured tobacco is sold in the markets.

At present there are 97 ha used for flue-cured tobacco. Thirty-two ha are planted three times a year. There are eight village barns, and eight company-owned barns.

The average yield is 570 kg per ha. There are about 500 growers.

Flue-cured tobacco is a popular crop in the Goroka area. A large part of the extension programme is managed by the companies, thus reducing government commitment.

In 1976 the area for flue-cured tobacco is to be increased in the Goroka and Asaro areas, bringing the total area to 120 ha. To keep pace with the increased production, three more village barns will be built.

Crop management will be improved to bring the average yield up to 600 to 620 kg per ha.

A tobacco-growers' meeting house will be constructed in 1976 at a site to be decided by the growers.

Seed for fire-cured tobacco will be distributed to Okapa and Lufa, to increase local market sales.

Forward planning beyond 1976 depends on the definition of a national policy from the central government. The establishment of a National Marketing Authority is at present under consideration.

A woman tobacco grower.

A village tobacco barn under construction.

Cattle

There are 10 233 head of cattle of which 5 533 are locally owned on 433 projects, mainly in the Kainantu area. Expatriates and missions own 2 000, DASF 700 and ELCOM at Yonki 2 000.

There is a single DASF-operated abattoir near Goroka. Throughput in 1974-75 was 1 800 beasts with 420 from local projects. Production from the abattoir satisfies most of Goroka's fresh beef requirements.

In addition to the turnoff through Goroka abattoir, about 300 cattle are killed annually for singsings.

There are Cattle Farmers' Associations at Kainantu, Okapa and Goroka. In general there is a low standard of village cattle project management throughout the province.

The main objectives are to increase the productivity of the village cattle industry. An annual expansion of 15 % is aimed at. All new project owners will attend training courses of one to two weeks, and refresher courses will be held for at least half of the established cattle farmers each year.

New projects planned for 1976 are Kainantu 20, Oburu 3, Okapa 12 and Korofeigu 5.

A stock-holding paddock will be developed in 1976 at Okapa, and the following year one will be established at Obura.

A road being built into the Wonenara area will enable development of village cattle projects in this area by 1979-80. The potential for this area is good as there are large areas of natural pasture.

In addition to management training, DASF field staff make at least two visits per year to all projects. Tuberculosis and brucellosis testing is at present being done on all cattle in the province, and this is expected to be completed in 1976.

Pasture improvement is being carried out on some projects. In 1976 pasture seed plots of ½ ha each will be established at Marawaka, Kainantu and Okapa.

The Goroka abattoir has reached peak capacity. In 1976 work will begin to expand the Goroka abattoir and chilling facilities, and an abattoir at Kainantu will be commenced. The Kainantu abattoir should be completed by 1978. In 1977-78 a slaughter slab will be built at Obura.

With the increased slaughtering facilities available, in 1978-79 we will attempt to increase abattoir sales and reduce singsing consumption. The Kainantu throughput will be 15 to 20 beasts per week (20 % of this will probably be from Markham and Ramu).

In 1979-80 slaughter slabs are planned for Korofeigu and Okapa.

Present turn-off for cash from village projects is about 7.5 %. By 1980 it is planned to increase this to 25 %.

By 1980 at least 80 % of all abattoir throughput will be from village cattle projects. With increased confidence and training in managerial and technical skills a greater involvement of Cattle Farmers' Associations in the running of the industry is anticipated by this time. Presuming a natural increase held at 70 % with steers turned off at 2½ years, and expansion maintained, the total village cattle project herd could number over 16 000 head with an annual production of 300 tonnes.

Pigs

There are about 100 village projects at present assisted by DASF, involving 350 pigs, mainly in the Goroka, Asaro and Watabung areas. All pig meat sold at shops in the province is imported into the province.

Because of the high price of protein food, village expansion is being discouraged until a cheaper source of protein is obtained.

Farmers find that the sale of fresh foods is more profitable than feeding surplus food to pigs.

For the present, existing projects will be given advice and assistance. Little change is

expected over the next five years, until cheaper protein and other foodstuffs are readily available.

If the price offered by local butchers reaches an economic level (K2.11 per kg) three fattening units will be established near Goroka where pigs supplied from a central breeder will be fattened on a complete ration.

Poultry

There are 15 indigenous projects with 1 390 birds. One expatriate and one Papua New Guinean producer supply eggs for the urban market.

Expansion of meat and egg production is continuing. "Backyard" projects are also being established in all areas. These projects are free-range during the day and housed at night, with no supplementary food. DASF is encouraging these projects by distribution of Australorp roosters.

Intensive type poultry projects will be expanded to a maximum of 20, where farmers show interest. At the present time these projects sell live birds at local markets. In 1976 DASF will survey the main local markets to determine the live-bird potential.

At present development is held up due to a shortage of day-old chicks. DASF will endeavour to ensure supply from Lae.

Ducks are already established in some villages. In 1976 duck projects will be established at Marawaka and Lufa.

In 1977-78 DASF will encourage local government councils and private enterprise to handle and store feed, and if this is achieved, there will be increased promotion of egg production.

In 1978 facilities to produce day-old chicks in Goroka may be established. There is also the possibility of commencing commercial broiler production with processing in the Goroka area at this time. Provided feed supply and day-old chicks are available, the province could be self-sufficient in poultry meat production by 1980.

Sheep

There are 9 smallholder projects established, 8 at Kainantu, 1 at Okapa, and 5 new ones awaiting stock. These will be stocked with 50 head of Bena Bena sheep in 1976.

A combined DASF and New Zealand research project is at present examining the suitability of sheep for smallholder projects where cattle are unsuitable.

Further development of the sheep industry will be delayed until the research project produces its results.

Meanwhile, advisory services to the present projects will be improved, with training sessions for staff and farmers.

In 1977-78, if the initial results of the research programme are successful, five pilot projects will be established, in localities yet to be decided. The projects will be where cattle projects are not feasible due to topography or high population density. In the first year 50 wethers will be put on the projects, and in the second year, 50 ewes. The industry will still be in the research stage, so further plans are not yet decided.

Fish

Carp ponds have been built at many villages. In recent years carp ponds have been discouraged as they were considered non-economic units. However, these are now being encouraged particularly in more remote areas where they can be of nutritional value.

In 1974-75 extension efforts were concentrated on encouraging carp ponds in remote areas of Korofeigu and Lufa. In 1976 development of carp ponds will continue in Frigano, Ubigubi and other remote areas.

Trout have been introduced to the rivers of the province. In 1974-75 500 000 trout fingerlings were put into the Henganofi, Marawaka and Asaro Rivers. Trout of about 1 kg have been caught in the upper Bena rivers from fingerlings distributed 18 months previously.

The main breeding centre is at the Kotuni trout farm, which is privately owned with indigenous shareholding. It has an annual turn-off of 9 tonnes of trout at K2.64 per kg. Their main market is the Papua New Guinea catering trade, but local people buy some for local consumption.

Local people are successfully fishing the Omahaiga River and selling and eating what is caught.

Rivers stocked in 1975 will be surveyed in July to August 1976. Local people will be discouraged from catching trout in rivers newly stocked for at least 12 months.

Distribution of trout is paid for by the Area Authority, using Rural Improvement Programme funds. In 1976 the Area

Authority is to purchase a 40 % interest in Kotumi farm, for approximately K16 000.

The attitude of the Eastern Highlands people is favourable towards development of a freshwater fishing industry. Government and private knowhow is adequate to support the enthusiasm of the village people. It is feasible that within 5 years all the rivers in the province could be seeded with trout and all still water with other appropriate varieties of fish. This will give both improved diet and a basis for expanded economic production.

Chillies

Chillies are grown only at Marawaka, in an area which is accessible only by air.

Present area is estimated at 10 ha, with a production of 2 098 kg per year.

Good quality birds-eye chillies are produced, but production is not fully realized as people are not picking their full crop.

More promotion of the crop will be carried out in the Marawaka area to encourage the harvesting of all production. In 1976, 3 ha will be planted. In the following year the area of chillies will be increased by 1 ha to 14 ha.

If the high price continues, expansion will continue in the Marawaka area.

Bees

DASF has about 300 hives. The honey is purchased by Public Health Department, for 80 t per kg, at the rate of 600 kg per month.

Lack of expert knowledge has prevented expansion to village production. It is hoped that an expert from overseas will be recruited in 1976, and the present colonies will then be expanded to 500 hives in 12 months. This stock will be used for training, research, and supplying stock to interested people.

If results are favourable, extension for smallholder bee-keeping will begin, with about 20 to 30 hives per man.

The number of smallholder hives in 1977-78 would be 1 000, with production of 20 kg each. Income would be about K14 000. The number of hives would double each year until the market potential is filled. By 1979 the project should be becoming self-sustaining, employing its own management.

Subsistence gardening and nutrition

Ninety-two per cent of the population live in villages and are subsistence gardeners. Ninety per cent of the diet is sweet potato, and protein is low in the diet. There is insufficient appreciation among the village people of the need for improved nutrition.

Public Health Department have nutrition gardens of ½ ha each at Goroka, Kainantu and Henganofi.

New nutrition gardens are planned for Lufa, Okapa and Marawaka in 1976. All gardens will be increased to 1 ha each.

All DASF subprovince centres will establish and maintain a permanent collection of all subsistence food plants, to improve the knowledge of staff and others of these plants. These gardens of ¼ ha each will be established in 1976.

DASF supplies information to the Provincial Nutrition Committee for the radio programme on Radio Goroka (Krai bilong Kumul).

The present DASF programme concentrates on increased peanut production. The Area Authority and other bodies are being encouraged to purchase tractors and ploughing equipment for hire to villagers.

The Yagaria Rural Co-operative buys peanuts for roasting, and also supplies seed to growers. DASF provides facilities to assist the Co-operative with buying when required. The Co-operative purchased 6 tonnes of peanuts in 1974-75.

The 1976 programme will give particular encouragement to planting of corn and peanuts in all areas.

The long term programme will maintain the level of propaganda particularly with regard to nutrition through both schools and radio.

In 1977 more emphasis will be placed on commercial peanut growing for local consumption.

Essential information being gathered in current research projects on subsistence crops, particularly on crop rotation, will be passed on to the farmer.

Wildlife

There are at present no wildlife activities in the province. In 1976 negotiations will be held to establish one wildlife management area, possibly at Goroka, Lufa or Okapa.

A small cassowary project will be established at Ubigubi in the Labogai area.

In future years DASF will continue to encourage local government councils or influentials to define wildlife management areas. One such area for each subprovince is aimed at for 1977-78.

NEW IRELAND PROVINCE

By N. Yambi Simbak and Peter Jones

Yambi Simbak is Provincial Rural Development Officer at Kavieng, in the New Ireland Province. He has been at Kavieng since May 1975. He comes from Finschhafen in the Morobe Province. He went to high School at Bugandi in Lae, and then to Vudal on a W.R. Carpenter scholarship. After finishing at Vudal in 1969, he joined CPL and worked on their plantations at Kokopo and Talasea for 10 months. He then resigned from CPL and took up a job with DASF. His first posting with DASF was to Manus, where he first met Peter Jones, who was then PRDO Manus. Later, when Mr Jones transferred to Kavieng, Mr Simbak was acting PRDO Manus for 10 months. In October 1973 he transferred to Buka, then to Kavieng in May 1975. Since then he has been PRDO in Kavieng.

Peter Jones came to Papua New Guinea from Stanthorpe in Queensland. He has spent 6 years in the Madang Province, 2 years in Wau, 2½ years as PRDO in Manus, and has been in Kavieng since December 1972, as PRDO up until May this year when Yambi Simbak took over from him. He is now officer-in-charge Special Projects, New Ireland.

Yambi Simbak

Peter Jones

The main island of New Ireland has a narrow coastal fringe rising to a rugged central mountain range of 1 500 to 2 500 m. The outer islands have a similar terrain with the exception of Emira Island which is mainly flat.

Temperature and rainfall patterns are similar to most areas of Papua New Guinea with the south-east "dry" season and the north-west "wet" season. The rainfall pattern however is reversed in the southern end of the main island.

Rainfall varies from 3 220 mm per annum in the northern area of the province to 2 100 mm per annum towards the Namatanai area. Some of the wetter areas of the west coast and offshore islands average 4 400 mm.

New Ireland soil types range from coral sandy soils in coastal areas, to yellow-brown clay loams inland from the sea front, and shallow limestone-based soils in the mountain areas. There are also isolated locations of soils of volcanic origin.

Thee province has a wide variation in vegetaation types ranging from open grassland areas vwhich support *Themeda* spp. and kunai, to seecondary regrowth bush, to virgin rainfoorest. Mangroves occupy mud flats along the coastal areas throughout the provinnce. Millable timbers are in abundance.

Moost of the arable land is situated along the coastal fringe. It is estimated that arable and mnarginal land constitute 60 % of the total land aarea of 10 193 sq km.

Lannd disputes have had an adverse effect on agricultural development in New Hanover and ccentral New Ireland. Other parts are relativvely free of disputes, with the exception of sonme densely populated areas.

Thoe Bulominski Highway commences at Kavieeng and extends down the east coast to Samoo. This highway is trafficable for most of the yyear, and work is continuing on its extenssion as far as Muliama, a further 45 km. Threee roads cross the island, at Lakuramau, Karu and Bo. Work is proceeding to complete a westt coast artery and so give road access to the greater part of New Ireland.

Spuur roads used for timber haulage are numerrous in the northern section of New Ireland. Self-help roads exist on all the islands of the province, the most notable of which are on the Feni and Tanga groups. New Hanover has the worst road system.

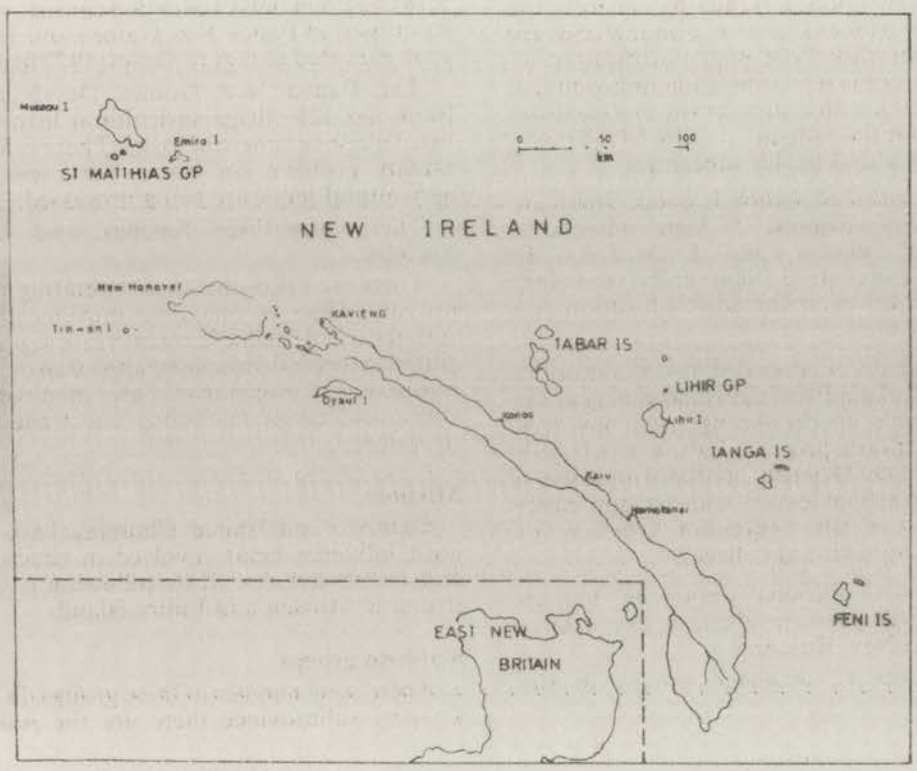
There are light aircraft strips scattered throughout the province including most island groups.

Kavieng is connected to the STD and ISD telephone systems and Namatanai may be contacted by connection through Lae. There are 40 radio telephones in the province some of which are unserviceable.

The NBC has a radio station in Kavieng (Maus bilong Soda Wara Antap) which provides an excellent medium of contact with the majority of villages in the province.

New Ireland has by Papua New Guinea standards a good transport system which includes coastal shipping to most centres. There is an overseas wharf at Kavieng and approximately 20 small coastal wharves in the province.

With the exception of southern Namatanai and at times the outer islands, most areas of the province are easily accessible.



DASF is establishing base camps in isolated areas so as to maintain farmer contact. These camps are being partly financed by the Rural Improvement Programme.

People

The total population of the province is 55 987, split between the three subprovinces as follows: Lamet 14 290, Namatanai 21 098 and Kavieng 20 599.

There are approximately 8 300 engaged in agricultural and forestry pursuits including plantations.

Members of the National Parliament for the province are Julius Chan (Minister for Finance and member for Namatanai), Obed Boas (regional member for New Ireland), and Perry Kwan (member for Kavieng). Some of the other prominent community leaders are, in Namatanai, D. Lanzarotte, an Area Authority member; in Konos, the President of the Area Authority, Nicholas Brokam; in Kavieng, Mazakmat, a traditional leader, and in Lamet, Walla Gukguk. These are only a few among the long list of traditional, business and political leaders.

The standard of health is very high by Papua New Guinea standards. There is no general nutritional problem although cases of infant mortality from poor nutrition occur. The province is served by a major hospital at Kavieng, 9 health centres at various locations throughout the province and by 64 aid posts. There are also 3 health subcentres.

Standard of education is good. There are 96 primary schools, 5 high schools, 3 vocational schools, and 1 skulanka. In addition there are 3 community secondary centres which cater for adult education at a secondary level.

The impact of education in agriculture in the New Ireland Province is increasing as the high schools are becoming more involved with agricultural projects. Laison with DASF is good. The Department has employed a number of school leavers who are now either employed in the extension service or attending agricultural colleges.

The Puas Vocational Centre has had an impact on village rice production, particularly at Puas on New Hanover.

There are 17 language groups in the province.

The New Ireland people have the major goal of an improved standard of living based on improved education, better health services, private ownership of vehicles, better housing and the development of business opportunities. People from other provinces are permitted a significant degree of involvement in agricultural development, which is in contrast to most other provinces in Papua New Guinea. In most parts of New Ireland the people enjoy a relaxed way of life, at the same time taking full advantage of their economic advancement.

Economy

The main crop is copra. There are 170 copra plantations many of which are interplanted with cocoa. There is a total of 224 agricultural leases comprising an area of 19 194 ha. There are 70 freehold properties with a total area of approximately 5 600 ha.

Fishing is growing in importance, and the new National Fisheries School at Kavieng when opened in 1977 will take 100 students per year.

Forest areas are fairly extensive. Current rights are 3 351 ha in 8 separate areas. There is a potential of 6 102 ha with a possible further 1 781 ha potential. Production consists of 250 cu m used in Papua New Guinea and 33 042 cu m exported as logs to Japan (1972 figures).

The Papua New Guinea Development Bank has 128 village agricultural loans and two village commercial loans. There is a bad arrears problem on loans. Very few new agricultural loans are being processed.

There are three Savings and Loan Societies.

There are 17 co-operatives operating in the province. The co-operative movement has suffered a bad decline in recent years as people adopt a more individualistic approach to their businesses. Co-operatives are involved in copra and cocoa marketing and tradestore operation.

Missions

Catholic and United Churches have the most influence being involved in education and health services. SDA following is very strong in Mussau and Emira Islands.

Self-help groups

There are a number of these groups. In the Kavieng subprovince there are the Alinga

Bina ggroup and the Usla group, involved with produice. The Munmaf group is involved with ttransportation and the Salamana group with sstore goods.

In New Hanover the Tutukul Isukula Associiation is in copra production. The Molotung group is mainly concerned with politiccs although expresses interest in assistiing rural development. In Emira there is a boatt-building group.

In New Hanover, at Puas, there is a Rice Growers' Association.

In Konos there is the Kuluan cocoa fermeintary group, the Lamasay fishing group, Lossu No. 2 cocoa growers, Lavatbura villagee fishing group and the Mapua cocoa groweers on Tabar Island.

In Namatanai there is the Saruai cocoa fermeintary group. Women's clubs have taken over tthe running of village rest houses in some villagees.

Politiical

Thiere are five local government councils: Mussau-Emira, Mattas, Tikana, Central New Irelamd and Namatanai. Sections of New Hanover are not under local government counceil. Tax rate in the various council areas varies from K2.50 for women in Central New Irelamd to K11.50 for men in Namatanai. In most councils women are taxed.

Thie Central New Ireland and Namatanai councils give effective support for agricultural develcopments.

Thie Minister for Finance and MP for Namatanai, Mr Julius Chan, has displayed an active interest in agricultural development and has an agricultural business of his own.

Thie Area Authority is active and helpful. However, much can be done towards making Authority members more fully aware of DASF programmes so that Area Authority plans and DASF programmes are in accord.

AGRICULTURAL DEVELOPMENT PROGRAMME

Coconuts

This is the largest industry in the province. There are 170 expatriate-owned copra plantiations with a total area of 24 794 ha. Village plantings are 20 100 ha.

Total copra production for 1974-75 was 21 2010 tonnes.

Pests and diseases are not a significant problem throughout the province.

A steady increase in planting of 3 % each year is aimed at. Plantings by 1981 will thus be 23 350 ha.

DASF supervises construction of copra driers when required. In 1975 10 copra driers financed by the Development Bank and Rural Improvement Programme were constructed. Construction of processing facilities to produce good quality copra is being encouraged in all areas.

Fertilizer is available under Rural Improvement Programme subsidy. Fertilizer applications are carried out by some growers on young palms. DASF will demonstrate and supervise the use of agricultural chemicals including fertilizers, herbicides, pesticides and fungicides to local planters.

Marketing is not a problem except on offshore islands. DASF assists local government councils in marketing of produce. The Copra Marketing Board has a main depot at Kavieng and a subdepot at Namatanai.

Coconuts are often interplanted with cocoa. Areas in New Hanover, Kavieng subprovince, Central New Ireland and Namatanai have been encouraged to interplant with cocoa in a programme begun in 1977.

The industry is expected to continue to develop as planned, unless continuing low price for copra reduces interest by growers.

Cocoa

Cocoa is next to coconuts in importance in the province. Present locally owned plantings are 790 ha, with an annual production of 393 tonnes. Cocoa production from expatriate-owned plantations is 800 tonnes.

Pests and diseases are insignificant. Recent high prices encourage increased plantings. Expansion work is in general only restricted by shortage of funds and shortage of trained staff in some areas.

In 1975 plantings were increased by 3 % in all areas. In 1976 an increase of 3 % is again aimed at, to 812 ha. Increased plantings will continue, especially in remoter areas. Interplanting under coconuts will be encouraged. By 1981 the total planting is expected to be 975 ha.

The possibility of resettlement schemes in sparsely populated areas, e.g. Muliama, will

Boat being constructed for the Area Authority for resale to New Hanover copra producing groups for copra transport.

be investigated. If feasible, resettlement schemes will be established between 1979 and 1981.

More cocoa fermentaries are being built throughout the province. Three new fermentaries were built in 1975, at Sarauai, Mapua and Pakinsela. Decentralization of processing facilities will continue throughout the next five years.

New areas expected to come into production by 1979 are Kavieng subprovince, west coast and the islands, and west coast Namatanai.

Production of dry beans will be increased by increased processing facilities available to growers.

Local Government Council funds have been offered for 1976-77, and these will be used to supply planting materials—plastic bags etc.

As well as encouraging new plantings and building fermentaries, DASF assists with pest and disease control, and assists with management of fermentaries and marketing.

There are three cocoa buyers in Kavieng who purchase processed bean. Wet bean is purchased on both east and west coast by a number of buyers. Pakinsela Cocoa Co-operative operates in the west coast of Namatanai.

Fisheries

Two fishing companies operate in the province. Gollin Kyokuyo Co., based at Kavieng, exported 9 000 tonnes of frozen tuna in 1975. Starkist Fishing Co. recently started operations in the New Hanover area with 8 catcher boats.

Gollin Kyokuyo has a fish-smoking factory near Kavieng with a capacity to process 10 tonnes of tuna a day.

DASF provides an inspection service to the tuna fishing industry and assists with the distribution of bait royalties—estimated at K100 000 in 1976.

Papua New Guineans participate in the tuna industry as fishermen, on catchers and mother ships, and there are long term possibilities for participation in baiting.

The National Fisheries School is to be built at Kavieng. Japan will provide about K1.6 million for the construction of the fisheries school in 1976. The number of students graduating annually from the school will be 100.

A local fishing industry is being developed.

In 1974-75 nearly 23 tonnes of fish were purchased at the Kavieng depot, and 69 kg of crabs. Crab purchasing also commenced at New Hanover.

Purchases of fish for the first quarter of 1975-76 increased by 86 % over the same period last year. We expect to purchase over 25 000 kg of fish this year. Price rises have increased people's interest in fishing.

The first stage of a crayfish project has been established at Emira. A crab project will be established at Taskul in 1976.

DASF will continue to provide assistance towards the establishment of a fish and seafoods industry at Kavieng, and it is expected that excess fish will continue to be marketed in Rabaul.

New village projects may be developed at New Hanover, Konos and Namatanai in 1978, depending on the interest of the people.

Freezers and marketing outlets will be organized for all projects which prove successful.

Rice

There are 30 ha of rice, and 12 tonnes were produced last year. There is potential for a large expansion, and the long term programme aims to increase the production to 1 100 tonnes, on 450 ha, by 1981. Success will depend on increased farmer participation in the project.

There are at present 80 farmers planting rice. At a training programme held last year, 154 farmers attended.

It is interesting to note that these farmers all paid a fee to attend the courses. The rice training programme aims to be self-sufficient, and farmers pay K1 for a one-day course, or K2 for a three-day course. Rice grown in the training programme contributes towards the food supplied to the farmers attending. Another feature of the programme is that farmers are allowed to bring their wives and members of their family for no extra charge.

There are a number of problems for the industry.

In a dry season such as 1974, when rainfall was half the usual amount, yields were low. This combined with falling price reduced farmers' interest.

Rising fertilizer cost added to these difficulties.

Armyworm, chinch bug and brown plant hopper were observed as major pests but outbreaks were controlled.

Another problem was that some farmers were unwilling to plant large enough fields.

Farmers will have to face other problems this year. The closing of the agricultural supplier in Kavieng means that DASF staff will be more occupied with arranging supplies for farmers. The council decision to cancel the fertilizer subsidy will raise the price to farmers.

Anticipated lower world rice prices will hurt the programme, especially if copra prices rise at the same time.

However, the present programme is as follows.

The present 80 farmers will be encouraged to expand planting to an average of 2 000 sq m (1/5 ha) each. New farmers will be encouraged to plant first fields of about 200 sq m. A target of 300 new farmers is projected, with an annual yield of 150 tonnes (two crops per year).

Training courses will continue.

Farmers will be encouraged to buy their own machinery. A rice huller will be installed at a school in the Namatanai area. The Lihir Island rice mill will be installed.

Two new rice hullers and one replacement are planned for 1977. As rice milling machinery comes up for replacement, more sophisticated equipment with whitening capacity will replace it.

In the long term, some experienced farmers may expand to large-scale production. Surplus production may be available by 1980 for export to other provinces.

Fruit and vegetables

DASF aims are to provide planting material and equipment at cost to villagers, with the help of council funds. Increased production is aimed at both to improve village diet and to serve as a minor cash crop.

Greater supply of all types of vegetables to town and station markets will be encouraged. Planting of seasonal crops with good economic return, e.g. watermelons and corn, will be emphasized.

The 1975 production of fresh food for sale was 750 tonnes. With co-operation from Lamerika plantation, fresh food purchasing was commenced on the east coast, at Dalum.

Two members of the New Ireland Area Authority, Tavita Leri (left) and Willy Schulz (right) discuss weed problems in rice with PRDO Yambi Simbak (centre).

This food is produced on the Lelet Plateau and problems of communication and supply have been to be overcome.

Production of seeds continued at Tigak in 1975.

Namatani Local Government Council granted K1 000 for purchase of agricultural supplies and seed purchase and distribution was undertaken to Namatanai and Konos.

Until other organizations develop, DASF will continue to provide planting materials using council funds, and will assist with marketing, especially of seasonal crops.

It is expected that production will be increased to replace an increasing amount of imported food by 1980.

Machinery used for rice production will also be used in the vegetable industry. Vegetables may be incorporated in rotation with rice crops.

However, the growth of this industry may be hampered by adverse weather conditions or pest problems. People may also find that copra and cocoa give better returns.

Rubber

There are two plantations, totalling about 750 ha. Smallholder plantings are only 25 ha. Mussau is the only village development in the province.

Low prices are associated with lack of interest in production from existing stands. Tapping of 3 ha was undertaken at Konos in 1975, and the unprocessed sheet was sold to Libba plantation. There are approximately 8 ha tappable at Konos and Namatanai. There is scarcely any interest in producing RSS.

DASF will encourage tapping of existing stands at Konos and Namatanai.

Clonal seed is available from Suma plantation, and nurseries have been established at Mussau. Seventeen ha have been established, and 20 ha will be planted in 1976. More nurseries will be established at Tigak and Mussau. A request for a second project at Mussau will be investigated.

Assistance in processing and marketing rubber will be given in Central New Ireland, with the assistance of plantation facilities, if

the owners of existing rubber plantings show interest in the crop.

It is planned that 40 ha will be planted at Mussau in 1977-79, to complete the project of 75 ha at Lamakanauru. Cover-crop will be established on this project. Rural Improvement Programme funds will be applied to this project, to provide road access to the project (1977) and for processing facilities (1978).

Nursery development and planting will be continued at Mussau if other villagers commence rubber projects. Three smallholder factories will be established on the Lamakanauru project. DASF will assist with production and processing.

Training courses in rubber tapping and management are planned for 1979 and 1980.

Cattle

There are 5 local cattle projects with a total of 76 head, and 1 956 head of cattle on expatriate-owned plantations.

There are two slaughterhouses, at Lakuramau and Mageh plantations, which offer their facilities for project cattle slaughter.

There is a generally poor response by the people to cattle project development proposals. Shortage of staff and land disputes have hindered development in some cases.

DASF programme includes assistance to both plantations and village projects. The general aim is to upgrade and increase existing herds, to introduce improved management practices, and to establish improved pastures on all projects.

DASF assists with marketing of beef and beef inspection services.

In 1976-77 an increase from 76 head to 120 head is aimed at for locally owned projects, and an increase of the plantation herd from 2 018 to 2 200. A turnoff of 200 beasts is expected for this year.

In 1976 it is expected that 4 new projects will commence on Taskul subdivision, and 3 new projects in Namatanai and Kavieng subprovinces will be investigated. Pasture improvement programmes will begin on these new projects as they are established.

A programme of pest and disease control is underway. In 1975 eradication of feral cattle commenced, and this will continue until about 1978, when it is expected that all remaining feral cattle will have been destroyed. This is necessary to prevent pests and diseases spreading from wild cattle to project and plantation cattle.

The cattle industry is expected to develop gradually in the province, with an increase in both plantation and village herds to the stage where all local needs are supplied. By 1981 the aim is to have 170 village cattle and 3 000 plantation cattle, with an annual turnoff of 300 beasts.

Poultry

There are 4 intensive poultry projects, 2 of them owned by high schools and 2 by local farmers. They include 1 475 layers, 200 broilers and 50 ducks.

Two new projects are being established in the Kavieng area. High schools have received a total of K2 600 of Rural Improvement Programme funds for expansion.

The present developments aim to supply the needs of the province, by about 1978.

DASF provides management advice, and assists with pest and disease control. We are attempting to have a feed supply agency established at Kavieng. Substitute of local carbohydrates will be arranged if possible.

In addition, DASF assists villagers to purchase improved stock including ducks.

Pigs

Village pigs are in abundance, and DASF and high schools have supplied 120 weaners to 15 farmers during the last year.

Other projects, mainly high schools, have 137 pigs.

Assistance has been given to Manggai, Utu and Mongop high schools to establish projects which will provide pigs for distribution.

Village farmers are assisted to purchase improved stock from high schools and DASF.

Intensive projects in the village are discouraged because of poor husbandry. A policy of upgrading village pigs on a village system of management by introducing improved stock is being followed.

Replacement breeding stock is difficult to obtain from Rabaul. Demand for weaners currently exceeds supply.

DASF assists with pest and disease control.

DASF will phase out as a distribution agent as high schools are able to meet the demand for the province. The department will continue to supply improved breeding stock to high schools up to 1978. The department will continue to advise on management and will assist with pest and disease control.

Coffee

The coffee industry is very small. There are only 2 ha at present being harvested, out of a total planting of 20 ha.

Present production is only 100 kg of parchment coffee per year. In 1975 2 ha of coffee were rejuvenated. The poor response to this work indicates a lack of interest in coffee production. the policy will be to continue rejuvenation of the remaining coffee plantings where interest is shown. Otherwise people will be advised to replant with cocoa and coconuts.

DASF will demonstrate processing where requested, and will purchase parchment coffee produced. In 1976 the aim is to produce 300 kg.

The production from existing plots is expected to increase up to 1 tonne by 1981. No additional plantings are expected.

Spices

A small area in the Namatanai subprovince has been planted to pepper—1 ha. No harvesting has been undertaken.

The availability of higher yielding cash crops such as coconuts and cocoa limit spices development, and people are not interested in spices.

Pepper will be encouraged only where conditions make alternative crops uneconomic, or in situations where individual farmers particulaly wish to grow pepper. By 1981 plantings may be increased to 6 ha.

DASF will assist with marketing—local sales and to New Guinea Islands Produce Co., Rabaul.

Wildlife

There is little activity at present. An area of 1 ha has been fenced at Liga for wildfowl protection. It will be made a wildlife management area.

Crocodile population and farming potential is being investigated at New Hanover and Namatanai. Little interest is being shown by the people.

A wildlife officer is necessary if a useful programme on wildlife is to be carried out. If an officer is obtained, demonstration crocodile farms will be established at Kavieng (possibly at Utu high school), and at Taskul. Village farms will be established if requested. DASF will arrange marketing of crocodile skins.

In 1977 DASF will investigate other wildfowl egg grounds in the province and take action to have them protected by declaration as wildlife management areas.

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