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COCONUT INDUSTRY IN NIGERIA

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Introduction

Coconut was introduced into Nigeria only about three centuries ago, most probably by the European missionaries. The vernacular names for coconut such as *Aku-Oyibo* (in Ibo language); *Isip-bakara* (Efik) and *Qua-Qua* mature (Hausa) mean 'whiteman's kernel' implying introduction by Europeans. Since its successful establishment, especially along the coastal region, the crop has gained considerable popularity in the country. Unfortunately, it has not developed into a large scale industry possibly because palm oil in the southern states and groundnut oil in the northern parts have been the traditional sources of edible oils. However, of recent the value of the crop has been realised by the government sector, private farmers and the public thus paving way for a new turn in the development of coconut industry.

The Nigerian Agriculture

Nigeria which was traditionally an agricultural country has recently lost its interest in agriculture in general due to the sudden financial boom from petrol. Prior to this 'oil boom', agriculture has been the mainstay of Nigerian economy providing employment to sixty-five per cent of active labour. Nigeria's basic resource is its land. Of the 98.3 million hectares of land, about 74 million ha. (75.3%) is arable, 9.8 million ha. (10%) forest reserves and the remaining is in built-up area and uncultivable waste. At present only about 33 million ha. is under cultivation.

The country's agriculture is based on small scale family units, 80% of the farm holdings being below six hectares (Table 1)

One major problem at present is the rapid rural-urban migration of able bodied youth, thus making farm labour very scarce and expensive. This is

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Table - I

Total land area farmed and type of household farms

Size of holdings (hectares)	Number of holdings	% of total	Cumulative percentage
Under 0.10	156,288	0.85	0.85
0.10-0.19	538,587	1.00	1.85
0.20-0.39	1,197,599	4.00	5.85
0.40-0.99	4,920,930	16.50	22.35
1.00-1.99	5,709,959	19.20	41.55
2.00-3.99	8,046,081	27.00	68.55
4.00-5.99	3,509,371	11.80	80.35
6.00-7.99	2,351,749	8.00	88.35
8.00-9.99	1,699.004	5.70	94.05
10.0 and over	1,678,189	5.95	100.00
Total	29,807,757	100.00	

Source: T. O. S. Rural Economic Survey of Nigeria

not compensated by sufficient advances in agricultural technology to enable a small number of farmers to meet the demand for food for the entire population. Realising the implications of increasing food imports, the government launched massive programmes like 'Operation Feed the Nation' and 'grow More Food' compaigns which unfortunately did not make the desired impact. The alternate forms of organising farm productron viz, farm settlements, group farms, co-operative organisations and large scale mechanised units also have not proved successful and these were abandoned one after the other.

Scope of Coconut Cultivation

The southern parts of Nigeri is suitable for coconut cultivation. The rainfall pattern is indicated in Fig. 1. Though coconut can be found in most of the states including the ones in northern region, the main coconut growing zones are the creak areas between Republic of Benin and Badgry in Lagos State and delta areas of Bendal and Riverse States. No statistical information is available on the crop. However, it is estimated that an area of about 8,000 ha. in the country is under coconut cultivation. Table 2 shows the copra production in the region.

In 1965 about 10,000 tons of copra was exported, Nigeria and Republic of Benin then being the main sources. Regional copra exports have declined considerably over the past fifteen years. Increased internal consumption could be a reason for this. In Nigeria, one of the factors for the decline during 1966-70 could be the 'Civil War'crisis in the country.

As already mentioned there are only very few large and medium sized plantations and even these are unfortunately mismanaged and under-exploited (Fig. 2). Most of the palms are grown in and around the homesteads. While coconut is grown as a commercial crop in the major coconut growing countries for its kernel, copra, oil, husk, shell and numerous other economic products, in Nigeria coconut is mostly grown as an ornamental crop and economic considerations are only secondary. There is therefore great demand for dwarfs especially the yellow, orange and red coloured palms. The industrial prospects of coconut products have not yet been fully exploited. Kernel is

Table-2

Copra production in West and Central Africa during 1961 - 77
(in hundred M. T.)

Country	1961-65	1975	1976	1977
Ghana	130	170	170	170
Ivory Coast	20	120	140	140
Nigeria	100	90	90	90
Guinea Biassau	40	60	60	60
Benin	20	30	30	30
Cameroons	20	30	30	30
Togo	60	30	30	30
Sierra Leone	60	20	20	20
Total in Africa	1480	1590	1800	1840
World production	36450	44030	51630	45850

Source: FAO

mostly eaten fresh or is grated and used for culinary purposes. The oil is extracted by traditional wet processing by housewives and is used as a body lotion and never for cooking.

There are only very few agencies to process copra. The quality of Nigerian copra is low and it fetches only a lower price. The reasons for this may be attributed to the utilisation of unsuitable nuts, primitive processing technique (sundrying) and unscientific storage of copra before export. Coconuts are not tapped for toddy as Nigerians prefer the native 'palm wine' tapped from oil palm or *Raphia*. Though in some parts, especially in cross River and Rivers States, tender nut water is taken as a soft drink, there is a superstitious belief in certain areas that it induces brain damage, indigeston etc. There is only one coir factory at Badagy in Lagos State. But of recent, some government schemes have been formulated to expand the coir industry.

Research Efforts

From the foregoing discussion it is clear that coconut is not a major crop in Njgeria. Coconut oil production was relegated to a secondary role in the country by the traditional sources of oil from oil palm and groundnut. However, realising the importance of crop diversification as well as the special benefits derivable from coconut, the Federal government of Nigeria mandated the Nigerian Institute for Oil Palm Research (NIFOR) in Benin City (Bendal state) to undertake research on various aspects of the crop.

The research work was initiated in 1966 by the introduction of a few exotic varieties from Malaysia, Cameroon and India. A new impetus was provided by the technical assistance from India through the Indian Council of Agricultural Research from 1975 to 81. A sub station for coconut research was established during 1976 at Badagry in Lagos State to undertake programmes mainly concerned with the problems of immediate practical value to the coconut growers.

a. The Coconut genetic resources

Systematic prospection for indigenous material in five states (Fig. 1) revealed that considerable variability for many characters has accrued during the few centuries it was in existence in the country. Yield, yield attributes and nut components of the talls and dwarfs in various states are given in Table - 3.

Though Tall, Dwarf Yellow and Dwarf Green cultivars could

be collected, most of the coconut populations belonged to the tall variety, whose origin was difficult to trace. From the shape of nuts the neighbouring Cameroon seems to be the probable source of Dwarf Yellow.

The talls have bigger crown, pronounced bole, inflorescences with fewer flowers and have bunches bearing medium to large sized nuts with high oil content. The high variability exhibited between palms of this variety for various characters indicates the scope of selection for these traits. In contrast to the talls, the Dwarf Greens are characterised by short stem, thin bole, smaller crown, large number of female flowers and heavy bunches with small sized nuts. Earlier collections made during 1967-72 had indicated the earliness of dwarfs in flowering, the green ones in particular. Some notable collections from the survey included palms yielding upto 177 nuts per year, those giving 350 g. of copra/nut as well as those with high female flower production (450/inflor.), early flowering (26 months) and high nut-set (70%). However since none of the palms combine all these attributes a comprehensive multiple crossing programme will be essential to incorporate all the desirable characters. Due to the unusual demand for coconut as an ornamental crop the aesthetic aspect has to be kept in mind while designing the breeding programme.

The NIFOR gene pool now consists of 25 exotic cultivars

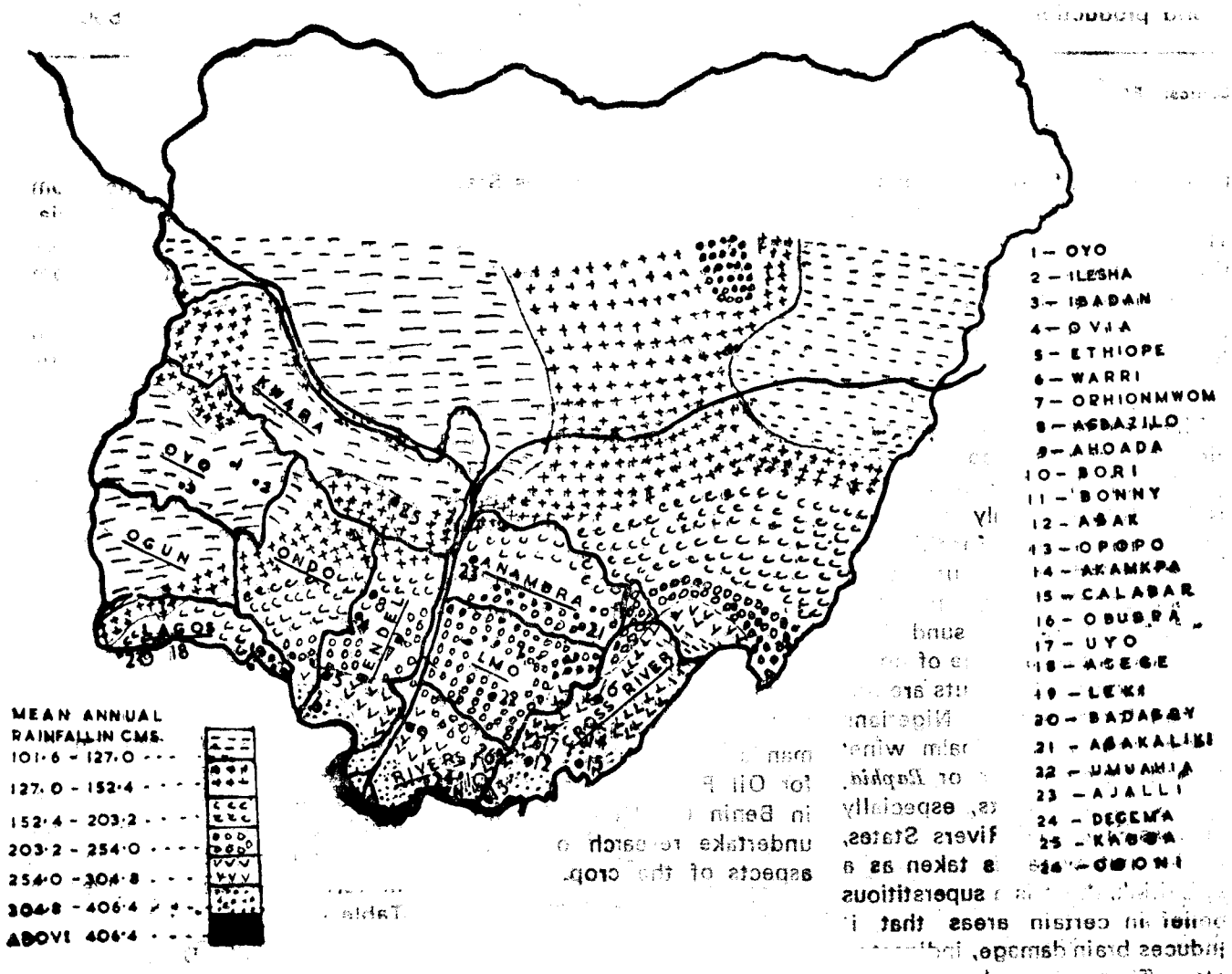

Fig. 1. Coconut collection — Rainfall pattern & area prospected

Table - 3

Yield, yield attributes and nut components of Nigerian coconuts

Character	Nigerian Tall From					Dwarf yellow	Dwarf Green
	Bendel	Lagos	Cross River	Oyo	Rivers		
1.*Potential yield of nuts (number)	76.8	40.3	69.4	57.0	51.0	61	39
2. No. of bunches	10.2	11.7	10.2	11.0	10.3	11	9
3. No. of spikelets/inflorescence	53.8	34.0	40.4	45.7	35.0	31	28
4. No. of flowers/inflorescence	53.8	17.3	64.8	38.3	34.3	48	112
5. Nut set (percentage)	39.4	40.7	29.8	41.6	32.0	31.4	24.5
6. Circumference of nut cm.	61.0	56.6	58.4	55.9	58.9	50.8	47.9
7. Weight of nut kg.	1.54	1.09	1.19	1.20	1.22	0.77	0.71
8. Circumference of husked nut cm.	37.3	34.5	36.6	34.7	34.6	34.6	34.4
9. Weight of husked nut g	733	598	697	573	608	513	505
10. Weight of copra/nut g	170.4	178.0	194.4	157.7	155.3	139	130
11. Weight of shell/nut g	182.6	150.7	152.2	147.7	142.7	114	90
12. Oil/Copra %	65.3	63.7	64.8	65.8	68.3	64.7	63.2

* Estimated yield based on number of female flowers and nuts at various stages of maturity

and 60 indigenous accessions. Among the exotic cultivars Malayan Dwarf Yellow (Fig. 3) was found to be very promising. The first set of hybrids between Nigerian Tall and Nigerian Dwarf Green were planted in 1971.

It is clear from the table that the hybrid is early bearing and better yielding than the tall parents. Unfortunately, the palms were planted in a poor soil and no seedling selection was practised and so the palms were not able to exhibit their full potential. A hybrid seed garden has also been established at Badagry.

Fig. 2. A coconut grove at Badagry beach, Lagos state

b. Agronomic Practices

Very little research has been done on the agrotechniques of this crop and the present recommendations are mostly based on sheer experience and information available from other countries. Nurseries are raised in polythene bags (500 gauge) of 40 cm x 35 cm. wherever possible (Fig. 4). Shading, mulching and irrigation are provided during summer. Field planting is taken up during May-June when the rains commence. Coconuts are seen planted haphazardly

Table - 4
Yield and yield attributes of the coconut hybrid

Hybrid / parent	Age (years)	Flowering (months)	No. of bunches	No. of nuts	Copra yield	Height m
			.....per	palm per	kg year.....	
Tall X Dwarf	9	52.0	8.2	53.0	8.7	2.9
Nigerian Tall	11	74.6	5.5	10.0	2.1	6.0
Nigerian Dwarf Green	10	40.2	6.3	37.3	3.3	2.3

depending upon the availability of land, irrespective of the existing recommendation for 7.5 m spacing. Usually a wire collar (45 cm x 120 cm) protection is given since the rodent attack is severe in most of the areas. Yellowing of palms due to nutrient deficiency is seen in neglected gardens in the coastal areas. Experiments are now underway to standardise nursery techniques, work out optimum spacing and nutritional requirements as well as to exploit the possibilities of intercropping under Nigerian conditions.

c. Diseases and Pests

The most serious disease so far reported is the bronze leaf wilt disease. This was first noticed in Awka area, following a severe epidemic in 1917. The disease was then termed 'bud-rot' and by an agricultural ordinance, farmers had to fell down more than 5000 palms as a control measure. Another outbreak occurred in the later half of 1951 in the Awka, Onitsha area. It is found to have spread from that locality and many parts of Anambra and Imo states are now affected. The earliest symptom is the shedding of green nuts followed by yellowing of the oldest leaves. There is marked brown discolouration of the terminal part of the unopened inflorescence. As the disease continues, successive younger leaves are affected and finally the palms succumb to the disease in 6 to 8 months. The Dwarf Greens have been reported to be more tolerant to this disease of uncertain etiology'.

Blast caused by *Pythium* and *Rhizoctonia* spp. which is a severe malady in oil palm nursery is noticed on coconut seedlings also. This as well as bud-rot, leaf spot, and immature nut-fall, though reported, have not been reckoned as serious problems.

Rhinoceros beetle *Oryctes monoceros*), red palm wevil *(Rhynchophorus ferrugineus* and scale insects (*Aspidiotus destructor*) are the most common pests of

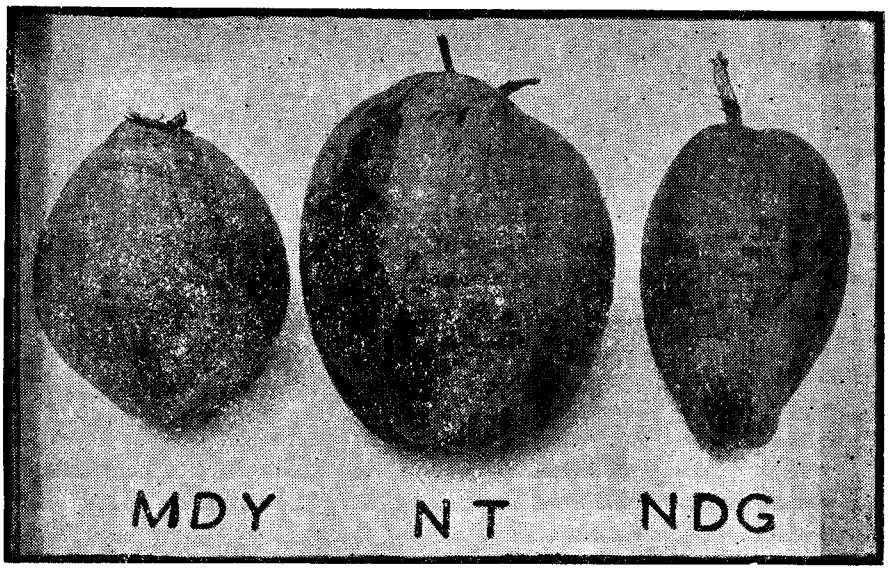

Fig. 3. Nuts of Malayan Dwarf Yellow (MDY), Nigerian Tall (NT) and Nigerian Dwarf Green (NDG)

coconut. But this can be checked effectively by timely control measures.

Future Lines of Work

The research wing on coconut at NIFOR has taken up the following aspects on a priority basis:—

1. Collection and evaluation of a large number of varieties, both indigenous and exotic, with a view to propagating the desirable ones and using them in further breeding work.
2. Improving the local genetic material through selection at various stages.
3. Hybridisation between cultivars to combine the desirable attributes like earliness, high yield, good quality, attractive colour, short stature etc. now found separately in various forms.
4. Large scale production of proven genetic material through establishment of hybrid seed gardens and varietal seed blocks.
5. Standardising the nursery techniques to obtain maxium number of transplantable seedlings at minimum cost.
6. Fertiliser and spacing trials to formulate recommendations on the optimum spacing and fertiliser application for both talls and dwarfs.
7. Investigations on major pests and diseases in order to work out remedial measures.
8. Exploit potentiality to optimise coconut land use through multiple cropping for which the crop is very amicable.

Coconut Development Activities

The development activities were so far restricted to the supply of a few hundred seedlings from the Ministry of Agriculture and Natural Resources in the coconut growing states. However, of late there is a growing demand for superior planting material and government and private agencies are coming forward to estabiish coconut plantations. The research and large scale estate plantings of Ivory Coast must have been one of the inspiring factors for the coconut expansion programmes of this neighbouring country

Lagos State has established a coconut industry board under which a coir factory and a coconut oil mill are being established in addition to its various efferts to develop cultivation and industrial avenues related to coconut. The State has also tree crop production programmes under which private farms to the extent of 400 ha. are envisaged to be covered under coconut every year. Rivers State has programmed to establish a hybrid seed garden with World Bank assistance The seed garden is intended to cater mainly for the coconut seed demand of Cross River and Rivers State. Other state Governments even with marginal areas for coconut cultivation (Oyo, Ondo, Benue) and unorthodox coconut growing states (Niger, Kaduna) have also plans to expand their coconut development activities, though on a small scale. To cope with the demand for seeds from various agencies NIFOR has established a seed garden to produce hybrids and seed blocks to distribute four of the most popular cultivars.

Thus coconut which so far has been a neglected crop is receiving due attention as an ornamental-cum-economic crop. With the ever increasing world demand for vegetable oil, Nigeria, blessed with suitable climate, soil and other resources is favourbly disposed to figure as one of the major coconut producing countries.

Fig. 4. Polybag coconut nursery in Nigeria