Pineapple in the Mekong delta in Vietnam

It is generally considered that pineapple was introduced in Indochina in the sixteenth century by the Portuguese and Indians and that the cultivars brought then have evolved over the centuries to give today's varieties. During the colonial period, pineapple growing was mainly concentrated near towns and especially in the Saigon-Cholon region, where some 4 000 ha of pineapple was grown in 1948. This production encouraged the building of the first canneries (1936) but the very marked heterogeneity of local production and difficulties in obtaining regular supplies soon obliged factory owners to establish their own personal plantations. It is important to note that industrial production consisted of Smooth Cayenne pineapple, whose trace is still found today.

Current production

The production zones have changed and pineapple is now grown through Vietnam, from the Mekong delta in the south to the mountainous regions in the north. However, two-thirds of production is from a few provinces in the Mekong delta, where the fruit is now grown mainly in acid sulphate soil (see box on page 10) in Tien Giang, Kien Giang, Bac Lieu and Ca Mau provinces where the hardier Queen group is clearly dominant today.

The size of private farms varies from 0.5 to 2 ha on average. Larger holdings (2 to 4 000 ha) do exist but in very small numbers and are often linked to a cannery, such as the VEGETIGI company in Tien Giang province which owns two farms covering a total of 4 000 ha.

Cultivated variety

The Kien Giang variety is well known. Its ancestors are probably Queen Singapore, Queen Gold or Queen Alexandra from Australia which was tested in 1938-1939. It is particularly well suited to the heavy, very acid, poorly drained lowland areas of the provinces in the south-western part of the Mekong delta (acid sulphate soils). It produces a great number of bulblets. Its fruits are 'tubular' in shape (much more elongated than Queen Victoria) and larger in the middle than at the extremities. The crown is small, the eyes are larger but not as deep as those of other varieties, and the heart is small. The fruits are small but dense, with weights varying from 0.8 to 1.3 kg in the first cycle and sometimes reaching 2 kg. The variety behaves fairly well with regard to wilt, a disease that is gaining in importance.

Cultivation

From the technical point of view, pineapple production in the Mekong delta must face up to special constraints related to cultivation conditions and increasing pressure from wilt. Several types of cultivation are practised: monoculture or cropping with coconut and/or areca palm. The soil and water conditions mean that farmers have to grow pineapple on land out of the water in the form of benches 4 to 6 metres wide separated by linked channels 1.5 to 5 m wide. Access to the plots is by boat or by bridges that are often just ordinary tree trunks. This type of development is common to all crops other than rice and installed by hand. It requires annual maintenance

VIETNAM — THE EVOLUTION OF PINEAPPLE GROWING IN VIETNAM

ha	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
NMM	3 747	4 196	3 869	3 848	3 827	2 812	2 732	2 630	1 982	1 703
RRD	1 584	1 505	1 123	1 364	1 188	976	1 261	1 526	1 385	1 108
NCC	4 261	4 506	4 296	4 385	4 441	4 923	4 257	3 700	4 166	4 041
SCC	807	1 081	1 192	1 931	1 807	1 834	1 665	1 597	1 566	1 425
CH	86	139	154	160	95	108	59	69	131	115
NES	1 366	1 434	1 320	1 329	1 033	755	263	157	154	126
MRD	19 816	22 631	23 089	25 941	26 485	26 699	24 453	19 544	19 829	15 519
Total	31 672	35 492	35 043	38 958	38 876	38 107	34 690	29 217	29 213	24 037

North Mountain and Midland (NMM); Red River Delta (RRD); North Central Coast (NCC); South Central Coast (SCC); Central Highlands (CH); North East South (NES); Mekong River Delta (MRD)

Source: Statistical data of Agriculture, Forestry and Fishery – Hanoi, 1996

VIETNAM PINEAPPLE PRODUCTION IN THE MEKONG DELTA				
Region	**Year**	**Cultivated area (ha)**	**Production (t)**	**Yield (t/ha)**
Mekong River Delta (a)	1995	15 519	130 870	8.43
Tien Giang (b)	1998	5 980	47 946	9.81
Kien Giang (b)	1998	8 491	86 456	10.02
Bac Lieu (b)	1998	3 300	31 580	10.00
Ca Mau (c)	1995	3 300	-	-
Source: (a) Statistical data of Agriculture, Forestry and Fishery – Hanoi, 1996 / (b) Provincial Statistical Office, 1999 / (c) Estimated from the division into two of former Minh Hai province				

and replacement every 5 to 10 years. The height of the bench governs the possibility of leaching out salts and toxic substances and also the risks of root anoxia during the rainy season (June to November). Plant material requirements are met for the moment by cultivated bulblets (5 to 7 per plant) in nurseries.

The maintenance of production plots and nurseries is considerably dependent on the farmer's financial situation and his crop priorities. Plantation is performed during the rainy season to enhance regrowth and rooting after surface preparation of the benches with a hoe. The nursery plants are often too large (900 g) and are planted directly with no trimming or disinfection. Planting densities vary from 10 000 to 30 000 plants per hectare. They are fairly low but soon doubled and tripled during the second and third cycles and farmers must grub up the surplus plants. Fruit grade decreases with the cycles, especially as field maintenance is inadequate. Fertilisation is random. Fertiliser is applied when there is a little money left and when the rice fields have been fertilised. Floral induction treatments (FIT) are known (calcium carbide) but poorly mastered (plant quality at the time of treatment, treatment conditions and dosage, etc.). Time between planting and FIT varies from 10 to 13 months and that from FIT to harvesting is about 6 months. Weed growth is often a hindrance during the first cycle. Weeding is carried out by hand.

Crop health problems

In spite of the water conditions mentioned above, *Phytophthora* rot seems to be controlled naturally by soil acidity. In contrast, mealy bug wilt is increasingly a problem and can affect 70 percent of the plants in a field. Control by the selection of healthy planting material should be envisaged rather than intensive use of insecticides to control the ant-mealybug vector complex. Indeed, chemical control could have serious consequences for the environment because of the omnipresence of water channels and the biodiversity that they contain.

Harvesting

The management of flowering at plant level and the heterogeneity of plant material—increasing with the cycles—require frequent visits to the fields to pick saleable fruits, allowing small farm sizes. In the present economic context, farmers do not seem to wish to change their practices and group FIT and hence harvests. In fact, the more or less marked and more or less voluntary staggering of picking throughout the year ensures them irregular but steady cash earnings. Pineapples are sometimes picked very green and sometimes too ripe. An optimal stage of ripeness is not yet taken into consideration. The fruits are transported mainly on small boats to the farmer's house and then on larger junks, whose numbers vary according to where they are to be sold.

The crop management sequences currently used by farmers are set against a difficult technical and economic background. There is practically no technical support, farmers suffer from serious poverty, credit and borrowing are very expensive, they are in an isolated position and lack infrastructure, etc. The most serious problem encountered by growers is the

Acid sulphate soil in the Mekong delta

In the past 10 000 years, deposits of river alluvium by the Mekong and marine sediment have mingled with the organic debris from former mangrove areas. Pyrite accumulation led to the formation of acid sulphate soils in marshy depressions. Today, such soils cover over 1.6 million hectares (44 percent of the delta) and are rich in iron pyrite and organic matter (12 percent). Salinity causes problems near the sea and inland for about 40 km. Through oxidation and drainage, pyrite gives pale yellow iron sulphate (jarosite) and iron oxide (geothite) and then aluminium sulphate (soil acidification to pH 2). If the soil dries, the aluminium becomes toxic for numerous plants and phosphorus deficiencies are observed. The sulphur and iron compounds are also toxic. The 'Plain of Reeds' (450 000 ha) and Ca Mau peninsula (1.1 million hectares) are the two main acid sulphate soil zones in the Mekong delta.

lack of guaranteed commercial outlets. It should not be forgotten that the Vietnamese government encouraged pineapple growing in order to cultivate areas with acid sulphate soils and also for use in a barter policy with the USSR. The collapse of the eastern bloc shortly after the launching of Vietnam's new agricultural policy led to a decrease in production because of a shortage of markets. The modernisation of old factories and the opening up towards a market policy could re-stimulate production. In any case, one of the Vietnamese government's wishes today is to dynamise pineapple growing in the traditional production areas and also in the rest of the country.

Pineapple growing in the Mekong delta faces numerous constraints (complex soil conditions, mediocre production and marketing, etc.). However, the potential is great because of the climate and above all because of farmers' great capacity for adaptation to new techniques as soon as an outlet is assured. The re-launching of production through the emergence of local development operations targeting both the upstream and downstream parts of the sector is essential (agro-industrial projects, teaching, research, etc.) because of its economic importance in the region ●

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Banana production in Madeira

Tourist destination *par excellence*, Madeira, a Portuguese island off the Moroccan coast, is nevertheless agricultural and the main crop grown is banana.

Bananas are grown practically everywhere in the island above an elevation of 300 metres and above all on the south coast. Growers traditionally water their fields using the basin method with water from irrigation canals fed by various springs upstream. Most growers are dependent on this irrigation water, which is rationed during the dry summer months. Most of the bananas grown have always been the 'Petite naine' cultivar in the Cavendish group, but a project for reconversion to 'Grande naine' and an Israeli-bred variety called 'Gal', which is more productive under the island's soil and climate conditions, is in progress.

MADEIRA — CALCULATION OF COMPENSATORY AID FOR LOSS OF INCOME WITHIN THE FRAMEWORK OF THE CMOB

Source EU	Bananas marketed			Compensatory aid	
	Volume tonnes	Value 000 Euros (*)	Unit value Euros/kg (*)	Euros/kg (**)	Total paid 000 Euros
1994	25 866	6 751	0.261	0.2482	6 420
1995	34 401	9 116	0.265	0.2718	9 350
1996	24 203	5 491	0.2269	0.3283	7 946
1997	27 890	8 041	0.2883	0.2763	7 706
1998	30 436	10 219	0.3358	0.2761	8 403

(*) Value ex-packing station.
(**) Aid paid to producers including supplementary aid paid because average income from Madeiran production is significantly lower than the average Community income.

Banana is the island's main crop and it plays a leading socioeconomic role. Bananas are grown on 1 500 hectares and nearly 10 000 farms are involved, growing the fruits on an average area of 0.15 ha. The crop provides employment for nearly 21 percent of the working population, that is to say 17 500 jobs, of which 15 000 are directly linked to the production sector.

Average production currently totals some 40 000 tonnes and yields vary from 20 to 40 tonnes per hectare. This represents 20 percent of the gross agricultural product and 4 percent of the island's total income. Peak sales, totalling an average of 50 percent of production, are from July to October. Only 15 percent of production is consumed locally. The rest is shipped to Europe (Portugal). Banana exports form a third of the island's total exports and are worth Esc4.8 thousand million, i.e. Euro24 million, half of which goes to the growers. As a European production zone, Madeira benefits from the growers' income support measures defined in the common market organisation of bananas (CMOB). By virtue of this, growers receive compensatory aid for loss of income (see table).

In addition to their production activity, the growers contribute to maintaining the typical 'banana landscape' that enhances tourism, the island's main economic activity ●

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