Indonesia Agriculture

Ministry of Agriculture, Republic of Indonesia 2006

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Directorate General of Processing and Marketing of Agricultural Products
Ministry of Agriculture, Republic of Indonesia
2006

FOREWORD

This book is represented only a small quantity of large amount of natural resources in agriculture belongs to Indonesia and limited diversity of large various products can be processed from agricultural products. However, this book could be a great stimulating for many readers from many countries to know more details about Indonesia and its agriculture products that could create great opportunities for business net working for good quality and specific products with competitive price and services come from Indonesia.

Introducing Indonesia is beginning with as a part of South East Asia countries, Indonesia has more than 17,000 islands stretching for more than 5,000 km across the equator. Lies between the Australian and Asian Continental and dividing the Pacific and Indian Ocean consists of five main islands (Sumatra, Kalimantan, Sulawesi, Papua and Java) and 30 smaller archipelagoes. Indonesia is a home to the majority of the populations. With tropical climate, Indonesia is rich of natural resources and large on biodiversities coming from deep green forest, snowcapped mountain, rich valley and an incredible range of animals and plants. This is only land part of Indonesia, event larger for fishery and sea resources.

How important the agricultural sector in Indonesia economy is describing with the role of this sector as a prime mover of national and regional economic development by contributing to GDP's growth and export earning, providing food and raw material for industry, creating job opportunity and increasing income for the people. Furthermore, this sector also features forward and backward multiplier effect through input-output linkages among industries, consumption and investment.

Indonesia is a major producer and exporter for many commodities such as palm oil, rubber, coconut, coffee, tea, cocoa, pepper etc. Export of ornamental plants and tropical fruits are growing in recent years.

Priority for Medium–term Development Plan for 2004-2009 identifies "Agriculture Revitalization as one of the economic development priorities. Agriculture revitalization is directed to enhance community welfare and to place strong foundation for economic development. This concept is a political commitment which has to be supported and further broken down during implementation by all instructions related to agriculture. In 2005-2025, agricultural development would be directed to achieve the vision of realizing competitive, fair and sustainable industrial agriculture system to guarantee food security and community welfare.

Long term vision and direction of agriculture development plan and strategies of agriculture development for 2005 -2009 is to realize strong agriculture for strengthening food security, improvement of value added and competitiveness of agricultural products, and the improvement of farmer welfare. Objectives of agricultural development are:

1. To develop professionalism in agriculture bureaucracy, self reliance of farmers, and the strong agricultural institutions.
2. To enhance sustainable agricultural resources utilization
3. To strengthen food security and safety.
4. To improve competitiveness and value added of agricultural products.
5. To improve agricultural activities that will stimulate rural economics activities.
6. To develop farmer oriented management system for agricultural development.

Target of agribusiness development is main concern of national program. Starting with development of the whole of agribusiness including down stream, on-farm, up stream (agro-industry), and supporting service business, increase of agricultural sector GDP and increase fresh and processed agricultural product export During 2005-2009 period, the growth agricultural sector (excluding forestry and fishery) GDP is targeted to increase from 2.97 % in 2005 to 3.58 % in 2009 or an average increase of 3.29 % per year.

The value added and competitiveness target has already been set. In the period 2005 -2009 processed product diversification for agricultural commodities is projected to increase 5 percent per year on the average. Export value of agricultural commodities is projected to increase by 11.34 % per year, higher than that of the growth of import value of 3.91 per year. Therefore, agricultural trade balance is projected to increase from US 3.9 billion in 2005 to 7.7 billion in 2009 or an increase by 17.11 percent per year. The total foreign currency obtained from agriculture sector is projected to increase from US$ 7.8 billion in 2005 to US$ 12.3 billion 2009. In the period 2005 – 2009 there would be increasing the production efficiency reflected by decreasing growth of production cost per unit by 5 percent per year.

Facing the global trade, Indonesia will enhance competitiveness of products and services, expand bilateral, regional and multilateral cooperation for market access and technical issues and more actively participating in International promotion. Market target is not limited to increase market share for conventional products. Introducing innovative/end products to create market will be a new breakthrough in promotion and market development. Global issues such as Good Agricultural Practices (GAP). Millennium Development Goals (MOGs) and food safety have already become fully concern of the government and all stakeholders. Socialization, training and setting of application have been conducted all nation wide. What Indonesia wants to be is a key player in the global market.

Jakarta, December 2006

Director General of Processing and
Marketing of Agricultural Products

Prof. Dr. Djoko Said Damardjati

DAFTAR ISI

FOREWORD

DAFTAR ISI

I. FOOD CROPS

A. Cassava *(Manihot esculenta)*

Cassava or manioc (*Manihot esculenta*) is a woody shrub of the Euphorbiaceae (spurge family) that is extensively cultivated as an annual crop in tropical and subtropical regions for its edible starchy tuberous root, a major source of carbohydrate cassava.

Cassava is widely eaten in Indonesia with three main uses: firstly as staple source of carbohydrate for human consumption. It is boiled or fried (after steaming), baked under hot coals, or added to *kolak* dessert. It is also fermented to make *peuyeum* and *tape*, a sweet paste which can be mixed with sugar and made into a drink. It is available as an alternative to potato crisps. The tender young leaves from the top of the cassava plant are boiled and eaten as green vegetable in much of tropical Asia. The mature starchy root tubers are boiled to make a potato-like staple, while the young roots are peeled and grated to make various cakes and savouries. Secondly for animal feed in the form of pellets. Thirdly as raw material for food or feed industries The major export market for cassava in Indonesia is for pellet used in compound animal feeding stuffs.

Center of Production

West Java, East Java, Central Java, Lampung, and Yogyakarta.

Products

Tapioca starch, manioc, chips, cracker, and pellets.

Tabel 1. Acreage and Production of Cassava, 2000 - 2005

Year	Acreage (Ha)	Production (Ton)
2000	1,284,040	16,089,020
2001	1,317,912	17,054,648
2002	1,276,533	16,913,104
2003	1,244,543	18,523,810
2004	1,259,152	19,507,049
2005	1,213,460	19,321,183

Source : Ministry of Agriculture, Indonesia

Table 2. Export of Cassava during 2000 – 2005

Year	Volume (Ton)	Value (US$ 000)
2000	165,193	13,741
2001	218,054	18,487
2002	101,247	11,527
2003	44,367	5,197
2004	484,614	61,521
2005	343,238	45,141

Source : 1. Central Bureau of Statistic, Indonesia. 2. Ministry of Agriculture, Indonesia

Table 3. Casava Export by Destination Countries 2002–2005

Country	2002		2003		2004		2005	
	Ton	(US$ 000)	Ton	(US$ 000)	Ton	(US$ 000)	Ton	(US$ 000)
China	66,286.4	4,612.1	31,808.7	2,078.2	90,246.7	8,810.9	223,504.4	23,207.7
Taiwan	7,193.6	1,849.2	5,491.6	1,567.2	38,884.6	7,642.6	22,298.3	6,301.0
Malaysia	10,629.2	1,800.8	530.9	223.0	26,828.0	4,776.3	33,614.85	5,903.7
Japan	9,112.1	1,766.0	941.4	96.1	8,545.5	1,485.1	9,728.4	2,042.0
Philippines	1,415.1	196,8	394.0	47.5	7,815.5	1,436.3	3,719.0	636.8
others	6,610.7	1.301.7	6,132.2	1,184.7	20,193.4	2,909.7	50,380	7,050.2
Total	101,249.5	11,526.6	45,298,8	5,196.7	269,423.2	27,060.9	343,242.9	45,141.4

Source : 1. Central Bureau of Statistic, Indonesia. 2. Ministry of Agriculture, Indonesia

B. Corn/Maize *(Zea mays)*

Maize (*Zea mays* ssp.) is a cereal grain that was domesticated in Mesoame rica. It is called corn in the United States, Canada, and Australia, but in other countries that term may refer to other cereal grains. Hybrid maize is favored by farmers over conventional varieties for its high grain yield, due to heterosis ("hybrid vigor"). Maize is one of the first crops for which genetically modified varieties make up a significant proportion of the total harvest.

Nowadays Indonesia has increasing the needs of corn every year for animal feed, industry, cooking oil, corn starch and sweet corn.

Corn Variety: Rama Wisanggeni, Bisma, Arjuna or hibrida Semar-1, Semar-2, CPI-1,C-2, Pioneer, BISI 1 and 2.

Centre of Production

East Java, Centre of Java, Lampung, and North Sumatera

Maize variety called Iamuru released in 2001 with production potencies of 7.6 tons/hectare has become famous in several dry land regions in eastern Indonesia such as Gorontalo and West Nusa Tenggara. Sukamaraga variety potentially inducing 8.4 tons/hectare was relesed in 2003 modified to have high tolerance in acid land spreading at Sumatera, Kalimantan, Papua, and Sulawesi. Thia variety is going future developed in South Kalimantan, Central Kalimantan, and Lampung.

Table 4. Acreage and Production of Maize, 2000 - 2005

Year	Acreage (Ha)	Production (Ton)
2001	3,285,866	9,347,192
2002	3,126,833	9,654,105
2003	3,358,511	10,886,442
2004	3,356,914	11,225,243
2005	3,625,987	12,523,894

Source : Ministry of Agriculture, Indonesia

Table 5. Total Export and Import of Maize, 2000 - 2005

Year	Export		Import	
	Volume (Ton)	Value (000 US$)	Volume (Ton)	Value (000 US$)
2000	29,562	5,477	1,284,419	165,324
2001	90,538	10,543	1,075,185	137,101
2002	29,015	3,384	1,197,401	191,735
2003	34,002	5,739	1,937,310	179,822
2004	40,828	10,468	2,739,202	132,613
2005	9,473	10,468	2,739,202	45,635

Source : 1. Central Bureau of Statistic, Indonesia
2. Ministry of Agriculture, Indonesia

Table 6. Import Volume of Maize by Origin (Tons)

Country	2000	2001	2002	2003	2004	2005
China	885,631	325,935	1,032,736	1,308,632	192,335	20,890
Argentina	37,657	23,813	222	1,024	233,451	132,470
USA	218,087	464,148	71,553	4,276	124,823	124,186
Thailand	1,726	173,844	31,483	52,759	84,677	35,528
India	1,836	17,650	620	1,100	97,069	1,813
Others	148,443	76,808	60,787	23,788	20,623	19,818
Total	**1,293,377**	**1,082,198**	**1,197,401**	**1,391,309**	**752,978**	**237,706**

Source : 1. Central Bureau of Statistic, Indonesia
2. Ministry of Agriculture, Indonesia

Table 7. Import Value of Maize by Origin (US$)

Country	2000	2001	2002	2003	2004	2005
China	103,775,640	38,631,742	119,609,600	160,914,260	27,233,648	4,804,927
Argentina	4,791,632	2,721,863	83,974	470,870	41,589,851	18,606,122
USA	27,015,566	54,702,297	9,740,092	1,866,459	25,992,989	6,764,326
Thailand	1,723,874	22,526,374	5,546,537	9,849,145	13,884,118	7,123,905
India	1,988,913	3,648,122	3,172,000	851,800	17,065,989	2,342,244
Others	24,673,614	15,623,442	11,445,259	5,869,214	6,846,792	5,992,991
Total	**163,969,239**	**137,843,840**	**149,597,462**	**179,831,748**	**132,613,357**	**45,634,715**

Source : 1. Central Bureau of Statistic, Indonesia
2. Ministry of Agriculture, Indonesia

Table 8. Export Volume of Maize by Destination (kg)

Country	2000	2001	2002	2003	2004	2005
Hongkong	1,485,928	63,071,364	878,030	1,248,514	1,857,716	-
Malaysia	10,353,165	9,211,004	7,036,353	21,040,972	5,700,295	566,730
Japan	14,053,253	11,217,962	7,560,308	7,662,129	5,632,495	-
Filipina	855,892	664,141	575,142	2,253,327	22,681,401	721,511
Thailand	59,694	285,000	8,620	124,800	1,571,090	1,864,619
Others	3,369,559	1,020,453	386,211	1,672,309	3,671,902	6,320,184
Total	**30,177,491**	**85,469,924**	**16,444,664**	**34,002,051**	**41,114,899**	**9,473,244**

Source : 1. Central Bureau of Statistic, Indonesia
2. Ministry of Agriculture, Indonesia

C. Peanut *(Arachis hypogaea)*

Peanut represented the second highest legumes commodity consumed in Indonesia after soybean, it is used for consumption purposes, besides being raw material in food and animal feed industries.

Farmers cultivated peanut as an intercropping commodity. There have been some constrains has blocked in the development of peanut production such as less optimal land management which leads to bad drainage and solid structures; improper in plant maintenance, pest and diseases, low production varieties, and lower quality of seed. In order to overcoming barriers, several efforts have to bemade. These efforts included cultivation techniques, utilization of preminent variety, arraged plants population, appropiate kind dosage of fertilizer, pest and diseases controling.

Peanuts are not true nuts, but rather legumes like peas or beans. Their difference is apparent in two ways. First, instead of producing pods above ground after flowering like other legumes, they thrust their flower stems into the ground so that the fruit pods develop underground. They are also unusual in that they store fat rather than starch. As a result, even though they are a high-fiber food, peanuts contain fewer carbohydrates than dried peas or beans.

Peanut has become common snack among city people in these days. This indicates peanut processed businesses experienced a big surplus. In 2004, dried processed peanut, including export reached 50 kg. As snack, people have preferred to choose manufactured products than making it themselves. It has opened an opportunity to improve process of manufacturing in order to fulfill human consumption as snack. Peanut for industries is a Spanish type in medium size and has pinky color.

Variety/Type of Plant

Several prominent varieties have been released by Ministry of Agriculture such as gajah, macan, banteng, kidang, kelinci and anoa.

Center of Production

Province	Districs
N. Aceh Darusalam	North Aceh, South Aceh, Pidie
North Sumatera	Simalungun, North Tap, Dairi, Deli Serdang
South Sumatera	Ogan Kumering Ilir
Lampung	Center Lampung, North Lampung
West Java	Garut, Cianjur, Subang, Sukabumi, Bogor, Sumedang
Banten	Serang

Central Java	Wonogiri, Jepara, Sragen, Pati, Kendal, Boyolali,
Banyumas,	Blora, Klaten, Banjarnegara, Kebumen
DI Yogyakarta	Gunung Kidul, Bantul, Sleman
East Java	Bangkalan, Tuban, Pacitan, Blitar, Sumenep, Gresik,
Jember,	Magetan, Lamongan, Pasuruan.

Table 9. Acreage and Production of Groundnut, 2000 – 2005

Year	Acreage (Ha)	Production (Ton)
2000	683,000	736,517
2001	654,838	709,770
2002	646,953	718,017
2003	670,247	759,533
2004	723,434	837,495
2005	720,526	836,295

Source : Ministry of Agriculture, Indonesia

Table 10. Total Export – Import of Groundnut, 2000 – 2005

Year	Impor		Export	
	Volume (Ton)	Value (US$ 000)	Volume (Ton)	Value (US$ 000)
2000	133,330	44,581	9,891	6,242
2001	119,564	36,893	10,759	7,898
2002	179,521	53,223	9,510	6,362
2003	126,720	42,792	15,222	8,332
2004	158,774	44,876	9,859	7,538
2005	83,918	27,927	5,564	4,080

Source : 1. Central Bureau of Statistic, Indonesia
2. Ministry of Agriculture, Indonesia

D. Paddy/Rice *(Oryza sativa)*

Rice was the staple food in the Indonesian diet, accounting for more than half of the calories in the average diet, and the source of livelihood for about 20 million households, or about 100 million people, in the late 1980s. Rice cultivation covered a total of around 10 million hectares throughout the archipelago, primarily on sawah.

As Indonesia most important food crops, rice annual per capita consumption is estimated at 145 to 150 kg. For 20 years, agricultural policy has fostered increased rice production and the country is now self-sufficient. More than 50% of the rice crop is grown on the island of Java, which features some of Indonesia's most productive land.

The supply and control of water is crucial to the productivity of rice land, especially when planted with high-yield seed varieties. In 1987 irrigated sawah covered 58 percent of the total cultivated area, rainfed sawah accounted for 20 percent, and ladang, or dryland cultivation, together with swamp or tidal cultivation covered the remaining 22 percent of rice cropland.

Variety

Several varieties have been released recently. Mostly prefereed by consumers and farmers beside IR are ciherang, ciliwung, way apo buru, and memberamo. Other prominent types are gilirang, cigeulis, cimelati, maro, HIPA 3, HIPA 4, fatmawati and the hybri, rokan. Almost all of new variety yield higher than IR.

Table 11. Acreage and Production of Paddy, 2000- 2005

Year	Acreage (Ha)	Production (Ton)
2000	11,793,475	50,898,852
2001	11,499,997	50,460,782
2002	11,521,166	51,489,694
2003	11,488,034	52,137,604
2004	11,922,974	54,088,488
2005	11,839,060	54,791,097

Source : Ministry of Agriculture, Indonesia

E. Soybean *(Glycine max)*

Soybean is still considered as a secondary crop utilized by farmers crop utilized by farmers as an option for rotation between rice plantings. The yield for the rice is about 5 tons/ha and for soybean is 1.3 tons/ha although domestic production provides up to half of total consumption estimated 2.5 million tons, progress in domestic sector has swon little improvement. Total Indonesian soybean production for 2000 is forecasted at 1.15 million tons

and import estimated 1.4 millions tons. Soybeans consumption has grown due to regular population growth and only a modest economic recovery. *Tofu* and *Tempe* remain the major sources for poorer Indonesians, who often substitute products for higher price meat.

Soybean products as processed food are highly potential in small medium industries development; in fact it has big opportunity to be handling as export commodities.

Prospect development in soybean in order to minimize import is highly potential because of land resources availability, suitable climate, applicable technologies, and human resources.

Variety/Type of Plant

Variety import estimated 1.4 millions tons. Soybeans consumption has grown due to regular population growth and only a modest economic recovery. *Tofu* and *Tempe* remain the major sources for poorer Indonesians, who often substitute products for higher price meat.

Center of Production

Lokon, Kerinci, Merbabu, Tidar, Raung, Rinjani, Lompobatang, Java, Nusa Tenggara, Sumatera, Sulawesi, Maluku Papua and Kalimantan

Java still dominates production of soybean. It has contributed 60 percent of total production in Indonesia, then followed by Nusa Tenggara, Sumatera, Sulawesi, Maluku Papua and Kalimantan.

Table 12. Acreage and Production of Soybean, 2000 - 2005

Year	Acre (Ha)	Production (Ton)
2000	824,484	1,017,634
2001	678,848	826,932
2002	544,522	652,755
2003	526,796	672,000
2004	565,155	723,483
2005	621,541	808,353

Source : Ministry of Agriculture, Indonesia

Table 13. Total Export and Import of Soybean, 2000 - 2005

Year	Export		Import	
	Volume (ton)	Value (000 US$)	Volume (ton)	Value (000 US$)
2000	12,042	4,509	2,568,472	558,718
2001	22,029	5,899	2,728,358	611,140
2002	13,985	6,683	2,716,618	591,104
2003	13,624	6,303	2,773,371	706,677
2004	18,381	6,703	2,881,735	967,957
2005	5,614	3,639	1,817,541	493,212

Source : 1. Central Bureau of Statistic, Indonesia. 2. Ministry of Agriculture, Indonesia

Table 14. Import Volume of Soybean by Origin (tons)

Country	2000	2001	2002	2003	2004	2005
United States	539,368	399,472	1,121,963	1,122,900	549,759	902,813
Argentina	92,066	0	77,187	10,276	92,805	144,500
Malaysia	31,322	93,429	76,382	17,983	5,255	13,452
Canada	46,333	10,503	47,617	18,393	353	1,952
Singapura	4,631	14,207	37,546	549	38	28,531
Others	1,854,752	2,210,747	1,355,923	1,603,270	2,233,525	726,293
Total	**2,568,472**	**2,728,358**	**2,716,618**	**2,773,371**	**2,881,735**	**1,817,541**

Source : 1. Central Bureau of Statistic, Indonesia. 2. Ministry of Agriculture, Indonesia

Table 15. Import Value of Soybean by Origin (US$)

Country	2000	2001	2002	2003	2004	2005
United States	116,277	82,990	245,921	313,341	224,012	257,281
Argentina	9,759	0	17,310	2,391	37,190	39,838
Malaysia	563	19,179	15,164	3,962	1,239	7,256
Canada	9,802	2,180	11,766	4,544	158	7,964
Singapura	880	2,826	7,867	127	26	1,053
Others	421	503,965	293,076	382,312	705,332	179,820
Total	**558,718**	**611,140**	**591,104**	**706,677**	**967,957**	**493,212**

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Source : 1. Central Bureau of Statistic, Indonesia. 2. Ministry of Agriculture, Indonesia

Tabel 17. The role of Agriculture in Indonesian Economy

No	Description	Remarks
1	Contribution to GDP	11.36%
2	Employee involvemet	42 million
3	Labor force share	47%

Tabel 18. General Information of Indonesia

No	Description	Remarks
1	Population	225 million
2	Growth rate	1,21%
3	Labor force	94.95 million
4	GDP	US$ 270 billion (2005)
5	Economic Growth	5.8% (2006)
6	Inflation rate	6.6% (2006)
7	Unemployment rate	11.8% (2005)
8	Arable land	11.03%
9	Total Area	1,919,440 sq km
	Land	1,826,440 sq km
	Maritim	93,000 sq km
10	Islands	17,508
11	Provinces	33
12	Districts	466

Source : www.undp.or.id

Food Crop Products


Cassava *(Manihot esculenta)*


Cassava Crackers


Fermented Cassava

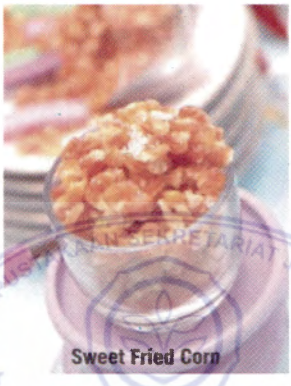

Tapioca

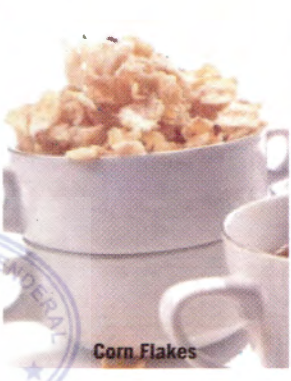

Spicey Cassava Crackers


Pop Corn


Corn Fried

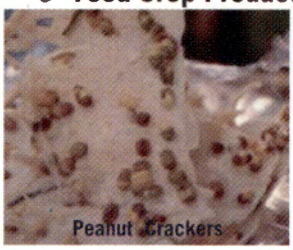

Corn Maize *(Zea mays)*


Sweet Fried Corn

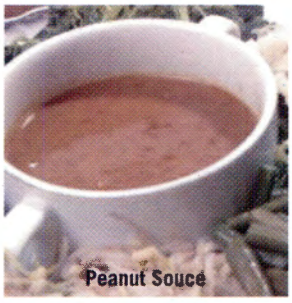

Corn Flakes

Food Crop Products


Salted Peanut


Peanut Crackers


Peanut *(Arachis hypogaea)*

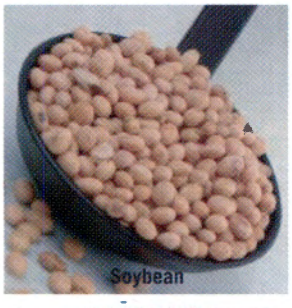

Peanut Souce


Flour Coated Peanut


Paddy/rice *(Oryza sativa)*


Rice


Rice Crackers


Soybean


Soybean Curd


Soybean *(Glycine max)*


Soy Souce


Soybean Milk

II. HORTICULTURE

A. Highlights of Famous Indonesia's Ornamental Plants

1. *Adenium obesum*
Family: Apocynaceae

In the wild this species can make a small tree of 12 ft (3.5 m) or more with swollen trunk and thick, crooked limbs, but in cultivation it seldom exceeds about 5 ft (1.5 m), with a sparse branching habit. Whorls of lance-shaped to oval, glossy leaves are grouped at the branch tips, but in winter it usually leafless. The very decorative trumpet shaped blooms are 1 - 2 in (38-50mm) long and very considerably in coloring: most popular is very pale pink or white with deepest pinkish red margins.

2. *Allamanda cathartica*
Family: Apocynaceae

The bright yellow-flowering Allamanda has become a garden staple in most parts of the tropics, usually as a woody climber but often, as a bushy shrub in a variety called *A. schotti.* As with other members of the Apocynaceae family, such as the Frangipani, all parts of the plant, including its milky sap, are poisonous. Even so the leaves, made into an infusion, are used in traditional medicine in South America as a purgative and its vapor is said to be a remedy for coughs. Centre of production: West Java Province (district of Sukabumi and Bandung) and East Java Province (district of Malang).

3. *Alpinia purpurata*
Family: Zingiberaceae

It has sturdy leaf stalks that rise from underground tubers with large leaves up to 30 cm long arranged along the upper stalks. The "flowers" actually bright red bracts that cover the small inconspicuous true flowers rise prominently from the tops of the stalks, often reaching 30 cm or more in length. Old stalks die back after flowering, but new rooted plants sprout among the withered bracts. Location: Jawa, Sumatera, Papua, and Bali

4. *Caladium* sp.
Family: Araceae

Portualum "fancy-leaves Caladium": tuberous herbs with membranous leaves varying from 15-30 cm long, mostly beautiful marked in many color and

patterns, on slender petioles; wide hybridized The larger peltate-heartshaped leaves is called *Caladium bicol* blood. The lanceolate strap-leaved hybrids is *C. pituratum.* Location in Indonesia: Java and Sumatra.

5. *Canna edulis Ker*

Striking foliage with burgundy, red, green, yellow and/or gold stripes. Showy orange flowers. The plant gives a lush tropical appearance, best as an accent plant in the garden or in a container on the patio. It is also makes an excellent houseplant, which grows to an approximate 3' to 6' height. This plant can be used as a bait for snails. Water regularly is needed

6. *Cycas revoluta*

Endemic to the islands of sourthern Japan, this palm-like species is a popular ornamental plant in Japan. It grows slowly with short, single or multiple trunks to 10 ft (3m) high with a compact crown or stiff pinnate leaves that have closely crowded, very narrow, spine tipped leaflets. It is the most widely cultivated Cycas in the world and is valued as a landscape subject, especially suited to courtyards and plazas. Slow growing, it is capable of living for 50 to 100 years or even more and it can be transplanted.

7. *Dendrobium*

The genus Dendrobium, with an excess of 1500 species, has always been popular with orchid growers. It enjoys a wide distribution, from India and Sri Lanka, through Southeast Asia to New Guinea, Australia, and the Pacific Islands. This genus is so complex, that is highly likely it will be dissected by botanists into a number of smaller genera.

Many hybrids have been developed in tropical countries, for both orchid enthusiats and the cut flower industry. Generally the flowers are shapely, and are from white to deep mauve. However other strains exit, with narrower segments, in colours from green, through to yellow, to rusty tones.
Center of production: DKI Jakarta Province (East Jakarta, West Jakarta, South Jakarta), West Java Province (district of Bandung and Sukabumi), DI Jogjakarta (Jogjakarta Municipality), and Bali Province (Denpasar Municipality).

8. *Heliconia rostrata*

Family: Heliconiaceae

Heliconias are native to the American tropics region and while a few can be found in seasonally dry locations, most come from moist or wet regions. The genus belongs to a larger taxonomic category called the Zingiberales. Growing

from rhizomes, they have erect shoots, each composed of a stem and leaves. There are three basic leaf arrangements. The first one is the leaves are oriented vertically and have long petioles, like bananas. The second is the leaves are more or less horizontally positioned and have short petioles, like gingers. The third arrangement is on which the leaves stick out obliquely, like Cannas.

9. Hibiscus rosa-sinensis

Family: Malvaceae

Hibiscus flowers range in size from small to enormous (some as much as 20 to 30 cm in diameter), occur in both single and double forms, and come in almost every color, from pure white through yellow and pink to ruby red. Though Hibiscus flowers last only one day, most varieties bloom so profusely there are nearly always several open at any time. In Indonesia it is called the "shoe flower", supposedly a reference to the fact that juice extracted from the petals was used to darken shoes. Both leaves and flowers are edible and sometimes used in traditional medicine.

10. *Jasminum* sp.

Family: Oleaceae

Jasmine is one of the most popular flowers throughout Southeast Asia, used for leis, religious offerings,and other floral decorations. Though there are several species, two are most frequently found in gardens and commercial nurseries, both with white flowers that may be single or double. *J. sambac,* the most common, is an evergreen climber, sometimes kept clipped to form a low shrub, while not a particularly attractive plant, the flowers are strongly scented and continuous, thus making it popular with gardeners. This variety flowers best when kept dry, well fertilized, and frequently pruned. *J. rex,* sometimes called Royal Jasmine, is a handsome climber with much larger and more beautiful star-shaped flowers which are, however, only faintly fragrant. Center of production: East Java Province (district of Bangkalan).

11. *Kalanchoe*

Family: Crasulaceae

Pinnata (bryophylumm) "at plant": also know as "miracle leaf" or "curtain plant" because young plantlets are produced from the leaves, even in broken off, and pinned to window curtains; the fleshy foliage 5-20 cm long, grayish green and tinged with red at fir Location in Indonesia: Java and Sumatra.

12. *Livingstonia rotundifolia Mart*

This attractive fan palm from the Philippines and Indonesia grows to 80 ft (24m). It has spherical scarlet fruit that eventually ripen black and will grow in

moist soil in the tropics. The seed remains viable for a longer period than most palms, and it can be grown from seed in a deep habitat.

13. *Phalaenopsis* spp.

Most people would be familiar with Phalaenopsis, known as the "Month Orchids". Many hybrids have been produced from the 50 or so wild species. It is arguably the most important commercial genus of orchids in the world. White Phalaenopsis hybrids are still one of the most popular fllowers throughout the world. Center of production: DKI Jakarta Province (East Jakarta, West Jakarta, South Jakarta), West Java Province (district of Bandung and Sukabumi), DI Jogjakarta (Jogjakarta municipality), and Bali Province (Denpasar municipality).

14. *Rafflesia arnoldy*

This is the largest species in genus, bears the world's largest flower. The plant shows nothing above the ground except its football - sized bud, which bursts from the stem of its host vine and unfolds as a single flower up to 3 ft (1 m) wide. Its fleshy petals surround central discs with circular hole revealing the stamens and pistils. It is mottled all over in dull yellow, creamy and mahogany red and smells of rotting meat to attract flies, which pollinate it. It has never been successfully cultivated.

15. *Sansiviera trifasciata Prin*

Native to India, Indonesia and Africa, these 60 species of popular and resilient evergreen perennials are grown for their stiff, flesh, patterned, 12-24 in (30-60 cm) tall leaves. Stems of greenish white, slightly fragrant flowers appear in late springs in warm conditions. In Africa the fibers are used to make hemp.

16. *Scindapsus*

Family: Araceae

The most common variety of scindapsus is *Scindapsus aureus*. Scindapsus is a climber with aerial roots and stems, which can reach 6 ft or more. A moss stick makes an ideal support. The stems are sometimes allowed to trail from hanging basket or wall display. Pinch out tips to induce bushes, keep the plant well a way from draughts.

17. *Vanda* spp.

A large export *vanda* industry has developed, using a handful of species in an extensive hybridising program. Vandas are often seen grown in large out door beds in lowland botanical gardens. Center of production: DKI Jakarta Province

(East Jakarta, West Jakarta, South Jakarta), West Java Province (district of Bandung and Sukabumi), DI Jogjakarta (Jogjakarta municipality), and Bali Province (Denpasar municipality).

B. Highlights of Famous Indonesia's Fruits

One of the many joys of Indonesia is the kingdom's stunning array of ambroisal fruits. The succulent sweetness, astonished various shapes, colours, sizes and heady perfumes delight not only visitors, but also send the Indies into raptures as each fruit comes into season.

Permanent local markets carry seasonal fruits as well as the other fruits which are available year round. As countries of tropical Asia modernise at an increasing pace, some of the less commercial varieties of fruit – those that must be eaten within a day or so of ripening, others that are too fragile to be transported without considerable care – are difficult to find in major cities.

1. Bananas *(Musa sapientum L. Kuntz)*

Family: Musaceae

Evidence indicates that bananas are one of the oldest fruits known to mankind and it is possibly one of the oldest cultivated plant. Their place of origin is believed to have been the moist tropical region of southern Asia. Bananas which usually being consumed are from natural crosses Center of production:

- DI Jogjakarta Province (Jogjakarta municipality, district of Gunung Kidul),
- East Java Province (district of Lumajang and Bojonegoro) North Sumatera Province (district of Deli Serdang),
- Riau Province (district of Indragiri Hulu),
- South Sumatera Province (district of Ogan Komering Ilir),
- Lampung Province (district of Lampung Timur),
- South Kalimantan Province (district of Kotabaru, HSU, and Banjar),
- East Kalimantan Province (district of Pasir, Kutai Kertanegara, Berau, and Kutai Timur, Bontang municipality),
- South Sulawesi Province (district of Majene),
- Bali Province (district of Klungkung),
- Papua Province (District of Jayapura), and
- NTT Province (district of Ende).

2. Durian *(Durio zebethinus)*

Family: Bombacaceae

Native to Southeast Asia, the fruit of the very tall durian tree is roughly the size and shape of a spiky football. Inside the tough skin are five white segments

enlosing two or three portions of soft cream colored flesh, each wrapped around a single large being seed. Both the flesh and the seed (after boiling) are edible. Today's durian are almost all hybrids and each has its special characteristics. Durian is best consumed fresh, although inferior quality or over ripe fruit is also cooked to make sweetmeats such as dodol or made into jam.
Center of production:

- Central Java Province (district of Jepara),
- DI Jogjakarta Province (district of Kulon Progo),
- East Java Province (district of Madiun),
- Nanggroe Aceh Darussalam Province (district of North Aceh),
- North Sumatera Province (district of Tapanuli Tengah),
- Jambi Province (district of Bungo),
- Lampung Province (district of Way Kanan and Lampung Selatan),
- West Kalimantan (district of Sintang),
- Central Kalimantan (district of North Barito, East Barito, Murung Raya, Katingan, and Gunung Mas),
- South Kalimant and Province (district of Tabalong),
- East Kalimantan Province (district of West Kutai),
- Central Sulawesi Province (district of Toli-toli),
- North East Sulawesi Province (district of Kolaka),
- Papua Province (district of Jayapura),
- Bengkulu Province (district of North Bengkulu),
- Banten Province (district of Lebak), and
- Gorontalo Province (district of Gorontalo and Boalemo).

3. Guava *(Psidium guajava)*

Family: Myrtaceae

Several different varieties of guava are grown in most subtropical regions. All have a thin edible skin, with many small edible seeds embedded in the centre of the flesh inside. The flowers are large and white. The fruit is yellow or green. Many kitchen gardens have a guava tree especialy to make its benefit, because the leaves – and sometimes the roots and bark – are universally known as a cure for dysentery. Because of their high pectin content which helps the juice to set quickly, guavas are favoured for jams, jellies, and preserves. Center of production North Sumatera Province (district of Deli Serdang).

4. Mango *(Mangifera indica L)*

Family: Anacardiaceae

There are dozens of varieties of mango, varying in shapes, colors and flavour from sublime to unpleasant. All these fruits are hybrids, as most of the varieties native to the region have somewhat stringy flesh with a sour, almost turpentine, flavour. The seed found in the mango can be planted and it will sprout. Mango

production centres are widely spread in several provinces, and each center has its own specific product.
Center of production:

- West Java Province (district of Majalengka, Indramayu, and Cirebon district),
- Central Java Province (district of Blora and Rembang),
- DI Jogjakarta Province (district of Gunung Kidul),
- East Java Province (district of Situbondo and Pasuruan),
- Nanggroe Aceh Darussalam Province (Sabang municipality),
- North Sumatera Province (district of Tapanuli Selatan),
- Central Sulawesi Province (district of Toli-toli),
- South Sulawesi Province (district of Takalar and Jeneponto),
- NTB Province (district of Bima and Sumbawa),
- NTT Province (district of Sikka, Sumba Timur, Belu, and Ngada),
- Papua Province (district of Merauke),
- North Maluku Province (district of Halmahera Tengah),
- Gorontalo Province (district of Gorontalo),
- Riau Province (district of Kepulauan Riau)
- Lampung Province (district of Tanggamus)
- East Kalimantan Province (Tarakan municipality),
- North Sulawesi Province (district of Sangihe), and
- Papua Province (district of Jayapura).

5. Mangoesteen *(Garcinia mangostana)*

Family : Guttiferae

Like the famous durian, the mangoesteen is a Southeast Asian native and bears fruit at the same time. The thick woody shell of the purplish-black mangoesteen encloses several segments of the most exquisite juicy white flesh, sweet yet slighty acid. Like many tropical fruit trees, the mangoesteen has its uses in folk medicine. The bark and skin are used to treat diarrhoea, and in Indonesia the fruit skin is used to control high fever, due to its chemical substance (xanthonin) which has characteristic as antibiotic.
Center of production:

- West Java Province (district of Tasikmalaya, Bogor, and Purwakarta),
- Central Java Province (district of Purworejo),
- DI Jogjakarta Province (district of Kulon Progo),
- East Java Province (district of Blitar and Trenggalek),
- Nanggroe Aceh Darussalam Province (district of Aceh Tamiang),
- North Sumatera Province (district of Tapanuli Selatan),
- West Sumatera Province (district of Limapuluh Kota, Pesisir Selatan, Padang Pariaman, and Sawahlunto),
- Jambi Province (district of Sarolangun),
- South Sumatera Province (district of Lahat),

- South Sulawesi Province (district of Bantaeng, and Polewali),
- Bali Province (district of Tabanan),
- NTT Province (district of Sumba Barat),
- Bengkulu Province (Bengkulu municipality)
- Banten Province (district of pandegelang), and
- Bangka Belitung Province (district of Bangka and Belitung).

6. Orange *(Citrus* sp.*)*

Family: Rutaceae

There are over 100 varieties of the common sweet orange, each varying in size, colour, and flavour orange grow well in many soil type. The orange is believed to have originated in China, hence one species name, *C. sinensis*. For over years a number of varities have been developed. Although oranges imported from temperature countries are often found in tropical Asian markets, locally grown oranges can also be found. Commercially grown-trees can each bears several fruits at the same time.

Center of production:

- West Java Province (district of Garut),
- Central Java Province (district of Cilacap and Sragen),
- East Java Province (district of Ponorogo and Magetan),
- Nanggroe Aceh Darussalam Province (district of Bireun),
- North Sumatera Province (district of Tapanuli Utara, Karo, Nias, Dairi, and Mandailing Natal),
- West Sumatera Province (district of Mentawai, Pesisir Selatan, Padang Pariaman, and Pasaman),
- Riau Province (district of Karimun),
- Jambi Province (District of Batanghari, Tebo, Tanjung Jabung Timur, and Jambi Municipality)
- South Sumatera (district of Musi Rawas and Muara Enim),
- Lampung Province (district of Tulang Bawang and Lampung Utara),
- West Kalimantan Province (district of Sambas),
- South Kalimantan Province (district of Barito Kuala, Tapin, Banjar, HST, and Banjarbaru municipality),
- Central Sulawesi Province (district of Donggala & Parigi Moutong),
- South Sulawesi Province (district of P.Selayar, Bantaeng, Bulukumba, and Pangkep),
- North South Sulawesi Province (district of Buton and Muna),
- Maluku Province (district of Maluku Tengah & Maluku Tenggara Barat),
- Bali Province (district of Karangasem and Bangli),
- NTT Province (district of TTS, TTU, Ende, & Kupang municipality),
- Papua Province (district of Jayapura),
- Bengkulu Province (district of Bengkulu Selatan),
- North Maluku Province (Ternate municipality), and
- Gorontalo Province (district of Boalemo).

7. Papaya *(Carica papaya)*
Family: Caricaceae

It is originated in Latin America, where it resulated from the crossing of wild types. The papaya (in some countries is called as the papaw), is well-known for its high vitamins A and C content, and for its medicinal properties, while papain – an enzyme found in both the fruit and leaves – is used as a meat tenderiser. There are many seeds concentrated in a hollow space in the center of the fruit.

The papaya has many different varieties, ranging in size from long pendulous fruits of 35-40 cm (14-16 inches) to big pear-shaped and little egg-shaped fruits. Many of the modern commercially grown hybrids, which are usually smaller in size than the old-fashioned fruit and known as Hawaiian or Solo papayas, have a richer flavour than older varieties.
Center of production: Central Java Province (district of Boyolali), West Kalimantan Province (Pontianak municipality), and East Kalimantan Province (Balikpapan municipality).

8. Passionfruit *(Passiflora* sp.*)*
Family: Passiofloraceae

The passionfruit is a climbing plant or bush.Two varieties of this Brazilian native are cultivated in a few areas of tropical Asia. Because of its limited geographical range, it is not very common.

The Indonesian variety *(P. edulis* Sains*)* has two forms – one with a purple skin called markisa and one with a yellow-orange shell with a mass of juicy translucent pulp suroounding edible greyish called konyal *(P. flavicarpa* Dng*)*. Markisa can be made as a drink which stand longtime.
Center of production: North Sumatera Province (district of Karo and Toba Samosir), South Sulawesi Province (district of Sinjai and Polewali), and West Sumatera Province (district of Solok).

9. Pineapples *(Ananas comosus)*
Family: Bromeliaceae

The pineapple, native to South America, is cultivated throughout tropical Asia. Several types of pineapple are found in the tropical region. Some are grown only for ornamental use, their decorative leaves making them a popular pot plant. The flower became enlarged and fusing together with the main leaves and stalk to create a fruit.
Center of production:
- West Java Province (district of Subang),
- East Java Province (district of Blitar),

- North Sumatera Province (Simalungun and Labuhan Batu),
- South Sumatera Province (district of Prabumulih),
- Jambi Province (district of Muaro Jambi),
- Riau Province (district of Indragiri Hilir),
- West Kalimantan Province (district of Pontianak), and
- North Sulawesi Province (district of Sangihe and Bolmong).

10. Salacca *(Salacca zalacca)*

Family : Palmae

The alternative English name for this fruit – snake fruit – is a good description of the appearance of its scaly brown skin. The salak grows on a short palm tree and is native to Indonesia. Salak fruit has a high tannin content and if the fruit not properly ripe, it can be unpleasantly astringent. Aficinados of the salak claim that those grown on the slopes of Bali's Mount Agung are the best to be found anywhere in Asia.

Center of production:

- DI Jogjakarta Province (district of Sleman),
- Central Java Province (district of Banjarnegara and Magelang),
- East Java Province (district of Bangkalan),
- North Sumatera (Padang Sidempuan municipality),
- Bali (distric of Karangasem),
- Riau Province (district of Kepulauan Riau),
- Lampung Province (district of Tanggamus),
- East Kalimantan Province (Tarakan municipality)
- North Sulawesi Province (district of Sangihe), and
- Papua Province (district of Jayapura).

11. Starfruit *(Averrhoa carambola)*

Family: Oxalidaceae

The starfruit, which has an excellent crisp texture and is full of juice, originally from Southeast Asia. Most starfruit are somewhat tart in flavour, but a hybrid known as Honey Starfruit is sweet and fragrant. Rich in both vitamins C and A, it is reputedly a good cure for hangover.

Center of production:

- DKI Jakarta Province (South Jakarta)
- Central Java Province (district of Jepara).

C. Highlights of Famous Indonesia's Vegetables

1. Cabbage (*Celery cabbage)*

Family: Cruciferae

Cabbage is grownunder a wide variety of conditions primarily requiring of high moisture content for maximum growth. If the cabbage is subjected to heavy rains following a dry season or when irrigation results in an uneven distribution of water, the cabbage may burst. They can be grown in all types of soils so long as it moist and fertile. Cabbages grow best in slightly acid soils.

The cabbage belongs to a form of species called the *Brassica oleracea* or the Crucifer family. This particular family is characterised by a compact head formed by the leaves. Its close relatives include collards, cauliflower, broccoli, and brussels sprouts. Cabbage is an excellent source of vitamin C and dietary fibre.

Center of production:

- West Java Province (district of Kuningan, Sukabumi, Cianjur, and Bandung),
- East Java Province (district of Probolinggo and Bondowoso),
- North Sumatera Province (district of Simalungun),
- West Sumatera Province (district of Agam),
- Jambi Province (district of Kerinci and Merangin),
- South Sumatera Province (Pagar Alam municipality),
- North Sulawesi Province (district of Minahasa),
- Central Sulawesi Province (district of Poso),
- South Sulawesi Province (district of Gowa and Tator),
- Maluku Province (district of Buru),
- NTB Province (district of Lombok Timur), and
- NTT Province (district of Ende).

2. Chilli *(Capsicum annum L)*

Family: Solanaceae

Indispensible throughout tropical Asia today, the chilli is not a native but was introduced from the Americas by the Portuguese and Spanish. Before the advent of chillies, black pepper was used to give pungent flavour to food.

During the past for centuries, the chilli has flourished and today is found in an almost bewildering variety of shapes, sizes, and pungencies throughout the region.

Chilli requires similar growing conditions to tomatoes, i.e warm tropical, frost free conditions. Capsicum grow on a small bush which needs fertilising and irrigation at all stages of growth. Chilli is very succeptible to extremes in weather. It is an excellent source of vitamin C, a good source of vitamin B6, E, and potassium.

Center of production:

- West Java Province (district of Cianjur and Bandung),
- Central Java Province (district of Semarang and Magelang),
- Nanggroe Aceh Darussalam Province (district of Pidie),
- North Sumatera Province (district of Karo, Tapanuli Utara, Deli Serdang),
- South Sumatera Province (district of Banyuasin),
- Lampung Province (district of Lampung Barat),
- North Sulawesi Province (Bitung municipality),
- Papua Province (district of Jayapura),

3. Eggplant *(Solanum melongena)*

Family: Solanaceae

Eggplant is a warm season vegetable which is extremely sensitive to frost. Eggplant needs plenty of fertiliser because of its long growing period and prolific fruit production.

The most widespread Asian variety is long and slender. Although there are round eggplants ranging in size from the tiny pea-like bitter eggplants *(S. torvum)* which grow wild, up to those the size of a tennis balls. Eggplants have a smooth, waxy skin, in colours ranging from deep purple through pale purple, with pale green, white and even bright yellow-skinned varieties. Eggplants are good source of dietary fibre, contain some vitamin C and pottasium.

Center of production:

- West Java Province (district of Kuningan, Sukabumi, Cianjur, Bandung),
- East Java Province (district of Bondowoso),
- North Sumatera Province (district of Simalungun), and
- Jambi Province (district of Kerinci).

4. Mushroom *(Agaricus bisporus)*

Family: Agraiceae

Three systems, shelf, tray and bag, is used for mushroom growing. Tray system are used by larger growers and is the major production method. The bag system, which allows for a smaller financial outlay is becoming increasingly popular.

This method also helps to alleviate pest and disease problems by allowing fast and easy removal of infected bags.

Center of production:

- West Java Province (district of Karawang, Kuningan, and Sukabumi),
- DI Jogjakarta (district of Sleman),
- East Java Province (district of Pasuruan), and
- North Sumatera Province (district of Simalungun)

5. Potato *(Solanum tuberosum)*

Family: Solanaceae

Potatoes appear to have been cultivated long before the first explorers landed in America. While little is known about the history of the potato prior to this, Peruvian pottery shows representations of the potato as a cultivated plant at least as early as the second century AD. The tubers were probably in use for centuries before this.

The potato is a cool weather crop, but cannot tolerate much frost. Well distributed, moderate rainfall or irrigation is needed. A heavy, well drained loam, made up of clay, sand and decayed vegetable matter, is the best soil for healthy crops. The potato plants also require lots of light because the amount of sunlight the plant receives determines to a great extent, the rate of photosynthesis and the amount of carbohydrate available for growth of the tuber.

Potatoes are an excellent source of vitamin C and dietary fibre, a useful source of potassium, magnesium, niacin, and thiamine.

Center of production:

- West Java Province (district of Kuningan, Sukabumi, Cianjur, Bandung),
- East Java Province (district of Pasuruan, Probolinggo, and Bondowoso),
- Nanggroe Aceh Darussalam Province (district of Aceh Tengah),
- North Sumatera Province (district of Simalungun),
- West Sumatera Province (district of Agam and Solok),
- Jambi Province (district of Kerinci and Merangin),
- South Sumatera Province (Pagar Alam municipality),
- North Sulawesi Province (district of Minahasa),
- Central Sulawesi Province (district of Poso),
- South Sulawesi Province (district of Gowa and Tator),
- Maluku Province (district of Buru),
- NTB Province (district of Lombok Timur), and
- NTT Province (district of Ende).

6. Shallots (*Allium ascalonicum)*

Family: Lillaceae

Botanists differ as to whether the shallot is a modification of *A. cepa*, the larger brown or purplish skinned onion, or whether it is a separate species, *A. ascalonicum.* Shallots contains less moisture than large onions, and therefore preferred for pounding to make the spice paste which forms the basis of many Malaysian and Indonesia dishes.

Shallots needs a light, fertile, well drained soil in a sunny position. Shallots are grown from bulbes of cloves like garlic and require generous feeding as they need to be grown quickly. It is an excellent source of vitamin C and calcium, also vitamin A, potasium, niacin, phosphorus, iron, thiamine and dietary fibre.

Center of production:

- Central Java Province (district of Brebes),
- Nanggroe Aceh Darussalam Province (district of Pidie).
- North Sumatera Province (district of Tapanuli Utara),
- South Kalimantan Province (Banjarbaru municipality),
- North South Sulawesi Province (Kendari municipality),
- NTB Province (district of Bima and Mataram municipality), and
- NTT Province (district of Rote Ndau).

7. Tomatoes *(Lycopersicon esculentum)*

Family: Solanaceae

The tomato is a warm season plant which is reasonably resistant to heat and drought, and grows under a wide range of climatic and soil conditions. Tomato seeds can be sown and will reproduce new plants. Tomatoes grow best when the day temperature is between 15-30 degree celcius. Tomatoes must have full sun and need warm, well drained, fertile soil. In most cases tomato plants must be supported with stakes or tied up. A tomato plant requires 3-4 months from the time of planting to produce the first ripe fruit. It is an excellent source of vitamin C, a useful source of vitamin E, with some vitamin A and dietary fibre.

Center of production:

- West Java Province (district of Kuningan, Sukabumi, Cianjur, and Bandung),
- East Java Province (district of Probolinggo and Bondowoso),
- North Sumatera Province (district of Simalungun, Karo),
- West Sumatera Province (district of Agam),
- Jambi Province (district of Kerinci and Merangin),
- South Sumatera Province (Pagar Alam municipality),

- North Sulawesi Province (district of Minahasa),
- Central Sulawesi Province (district of Poso),
- South Sulawesi Province (district of Gowa and Tator),
- Maluku Province (district of Buru),
- NTB Province (district of Lombok Timur), and
- NTT Province (district of Ende).

D. Highlights of Famous Indonesia's Medicinal Plants

1. *Alanguas galanga* (L) Stuntz.

This plant which is called galangale needs goods drainage for its creeping root. Its rhizome is very useful to cure diarrhea and skin problems like itching and ring worm. Center of production: Sumatera, Java, and Nusa Tenggara.

2. *Aloe vera*

Family : Liliaceae

Aloe vera had been used for many centuries. The Greek people at 333 BC identified the *aloe vera* as a medicine stem, meanwhile China people name it as Auci. The *Aloe vera* came from Canary Island western of Africa. In each 100 gr of *Aloe vera* contains water (99.51%), fat (0.067%), carbohydrate (0.043%), protein (0.038%), vit. A (4.594 IU), vit. C (3.476 mg).

Gel from the leave of *Aloe vera* is very useful to cure the wound, also as a drink for vitality. Its use as a medicine plant covers various disease such as; diabetes, cough, anemia, influenza, rheumatic and sinusitis. *Alue vera* can be used as subtance in various products of skin maintenance like moisturizer cream, scrub creme, and also for hair maintenance.

Center of production: West Java Province (district Bogor) and West Kalimantan (Pontianak City, Pontianak district).

3. *Curcuma domestica* Val

Family: Zingiberceae

The plant which is called turmeric needs good drainage and moderate humidity. Turmeric has rhizome which can be used as a medicine for diarrhea, blood cleaner and ulcer. It is also used as cooking spices.

Center of production: Java, Sumatera, Nusa Tenggara, Sulawesi, and Maluku.

4. *Curcuma xanthorhiza* Roxb

Its rhizome has buds which can sprout in medium acidity soil. As a medicine plant its use among others are for diarrhea, cough and as a substance for medicinal herb drink. Center of production: Java and Madura.

Description: vigorous vine, to 50 feet long; leaves opposite or in whorls of 3-4, mostly oblanceolate to elliptic-oblong, to 4-6 inches long, short-acuminate, attenuate to a very short petiole; calyx lobes unequal, corolla bright yellow with a paler throat, to 5 inches across, narrowed below into a slender tube to 1 3/8 inches long and not swollen at base, lobes obovate and rounded; capsule about 1.5 inches in diameter with spines about 3/8 inch long.

Probably from northern South America but now widespread.

5. *Zingiber officinale* Rosc

Family: Zingiberceae

This plant called ginger originated from Southeast Asia and for centuries has been used for cooking spices and medicinal herb for drink. It's chemical characteristic which is warm has specific aromatic scent and it can stimulate blood circulation. It also can be used as an expectorant, dioforetic, antitussive, antiemitic, anti septic, anti inflamatory, and reducing cholesterol.

Statistic of Indonesia Horticulture Product

Table 18. Export Value of Horticulture Commodities, 2003 - 2005

Commodities	Value (US$)			Growth 2005 over 2004 (%)
	2003	2004	2005	
1	2	3	4	5
Flowers and Ornamental Plant	**12,084.74**	**12,914.44**	**12,904.97**	**-0.07**
- Orchid	1,710.98	1,325.95	1,430.99	7.92
- Non Orchid	10,373.76	11,588.485	11,473.974	-0.99
Vegetables	**35,018.52**	**32,304.03**	**38,495.25**	**19.17**
- Shallots	2,421.13	1,888.93	1,520.42	-19.51
- Potatoes	4,241.12	3,556.13	3,576.13	0.56
- Chili	18.44	453.44	41.89	-90.76
- Vegetables Others	17,327.86	7,562.25	15,804.88	109.00
- Others	11,009.97	18,843.29	17,551.92	-6.85

1	2	3	4	5
Processed Vegetables	**30,517.50**	**28,677.16**	**45,665.70**	**59.24**
- Shallots	-	-	-	-
- Potatoes	14.99	121.87	252.34	107.05
- Chili	-	-	-	-
- Vegetables Others	1,480.07	2,590.24	1,174.50	-54.66
- Others	29,020.45	25,965.06	44,238.87	70.38
Fruits	**114,506.01**	**97,705.42**	**124,267.86**	**27.19**
- Mango	460.67	2,013.39	995.94	-50.53
- Citrus	331.41	1,543.52	442.35	-71.34
- Banana	0.51	778.51	1,288.89	65.56
- Durian	-	-	-	-
- Mangosteen	9,306.04	3,291.86	6,385.14	93.97
- Others	72,173.91	79,726.76	105,290.83	32.69
- Others	32,233.46	10,726.76	9,864.71	-8.04
Processed Fruits	**1,383.48**	**2,458.12**	**812.48**	**-66.95**
- Mango	**19.67**	-	-	-
- Citrus	**275.81**	**106.13**	**812.48**	**665.58**
- Banana	-	-	-	-
- Durian	-	-	-	-
- Mangosteen	-	-	-	-
- Others	**12.72**	-	-	-
- Others	**1,075.28**	**2,352.00**	-	**-100**
Multifarous Crop	**1,821.81**	**3,030.36**	**5,119.94**	**68.95**
Total	**195,332.05**	**117,089.54**	**227,266.19**	**28.33**

Sources: 1. BPS - Statistic Indonesia, 2005

Table 19. Import Value of Horticulture Commodities, 2003 - 2005

Commodities	Value (US$)			Growth 2005 over 2004 (%)
	2003	2004	2005	
1	2	3	4	5
Flowers and Ornamental Plant	**991.73**	**1,185.71**	**1,791.50**	**51.09**
- Orchid	226,882.00	350.05	537.75	53.62
- Non Orchid	764,849.00	835.66	1,253.75	50.03
Fresh Vegetables	**96,537.65**	**84,686.66**	**130,738.76**	**54.38**
- Shallots	12,369.95	14,240.44	15,412.13	8.23
- Potatoes	1,342.90	1,671.57	3,257.72	94.89
- Chili	0	0	66.41	0.00
- Vegetables Others	53,107.40	55,548.75	71,494.93	28.71
- Others	29,717.41	13,225.91	40,507.58	206.27
Processed Vegetables	**36,356.49**	**72,185.98**	**43,820.62**	**-32.29**
- Shallots	-	-	-	-
- Potatoes	9,555.53	13,670.01	16,292.50	19.18
- Chili	-	29,826.00	591.30	-98.02
- Vegetables Others	5,026.38	7,235.16	4,441.90	-38.61
- Others	21,774.59	21,454.81	22,494.92	4.85
Fruits	**1172,172.12**	**182,830.29**	**185,778.91**	**1.61**
- Mango	328.76	445.72	437.35	-1.88
- Citrus	47,890.42	51,220.24	40,537.16	-20.86
- Banana	403.85	188.84	400.86	112.28
- Durian	-	-	-	-
- Mangosteen	-	0.20	0.41	104.95
- Others	640.46	1,209.77	899.93	-25.61
- Others	122,908.63	129,765.52	143,503.21	-10.59

1	2	3	4	5
Processed Fruits	**2,923.75**	**3,572.89**	**4,783.37**	**33.88**
- Mango	**98.69**	**0**	**0**	**-**
- Citrus	**600.10**	**602.028**	**829.967**	**37.86**
- Banana	**-**	**-**	**-**	**-**
- Durian	**-**	**-**	**-**	**-**
- Mangosteen	**-**	**-**	**-**	**-**
- Others	**84.653**	**0**	**-**	**-**
- Others	**2,140.31**	**2,970.86**	**3,953**	**33.07**
Multifarous Crop	**681.96**	**329.53**	**551.38**	**55.19**
Total	**309,663.70**	**334,791.05**	**367,424.55**	**6.56**

Sources: 1. BPS - Statistic Indonesia, 2005

Table 20. Export Value of Vegetables, Year 2000 – 2005 (US$)

Commodities		2000	2001	2002	2003	2004	2005
Cabbages		5,517,402	6,869,019	9,758,703	11,401,593	7,802,338	9,130,463
Potatoes		4,629,330	4,769,777	5,726,540	4,449,642	3,764,522	3,951,962
	Fresh	4,583,161	4,664,010	5,641,181	4,375,399	3,590,097	3,676,079
	Proceed	46,169	105,767	85,359	74,243	174,425	275,883
Mushrooms		35,021,484	29,843,554	19,607,691	19,213,111	23,502,165	24,000,701
	Fresh	3,734,530	4,019,783	4,116,233	1,720,372	2,853,990	2,615,480
	Proceed	31,286,954	25,823,771	15,491,458	17,492,739	20,648,175	21,385,221
Onions		1,835,233	1,670,775	2,188,967	2,421,134	1,888,929	1,520,423
Tomatoes		1,518,350	1,965,720	2,254,874	2,630,145	2,715,406	1,128,649
	Fresh	654,543	553,248	302,098	234,094	317,687	433,245
	Proceed	863,807	1,412,472	1,952,776	2,396,051	2,397,719	695,404
Chili		1,137,164	1,089,305	926,896	941,613	1,581,358	1,804,624
Eggplant		1,527,756	2,283,284	1,467,721	2,650,331	1,828,444	-

Sources: 1. Bureau of Central Statistics, Indonesia
2. Ministry of Agriculture, Indonesia

Table 21. Export Volume of Vegetables, Year 2000 – 2005 (kg)

Commodities		2000	2001	2002	2003	2004	2005
Cabbages		39,816,373	48,288,168	49,415,364	42,686,295	33,656,999	39,202,632
Potatoes		30,704,210	31,647,950	28,162,521	19,129,304	16,830,692	14,538,907
	Fresh	30,593,815	31,447,255	27,922,987	18,987,257	16,553,806	14,142,839
	Proceed	110,395	200,695	239,534	142,047	276,886	396,068
Mushrooms		29,380,098	26,430,321	18,229,276	16,139,444	21,583,700	22,390,096
	Fresh	3,096,307	3,743,308	4,185,662	1,633,399	3,489,922	22,390,096
	Proceed	26,283,791	22,687,013	14,043,614	14,506,045	18,093,778	3,505,870
Onions		6,753,316	5,991,585	5,402,051	5,402,051	4,637,264	18,884,226
Tomatoes		3,467,354	4,070,965	3,902,007	3,920,007	3,696,680	4,628,270
	Fresh	2,373,105	2,340,662	517,469	571,469	751,571	2,063,194
	Proceed	1,094,249	1,730,303	3,348,538	3,348,538	2,945,109	1,168,689
Chili		1,115,117	2,269,545	1,577,512	1,577,512	1,879,374	894,505
Eggplant		835,436	958,029	1,047,477	1,729,494	1,072,657	1,617,180

Sources: 1. Bureau of Central Statistics, Indonesia
2. Ministry of Agriculture, Indonesia

Table 22. Exsport Value of Fruits, Year 2000 – 2004 (US$)

Commodities		2000	2001	2002	2003	2004	2006
Pineapple		72,599,050	76,727,967	101,569,186	87,286,570	99,600,964	128,917,357
	Fresh	1,123,574	886,695	2,784,582	2,315,283	529,122	219,703
	Proceed	71,475,476	75,841,272	98,784,604	84,971,287	99,071,842	128,967,654
Banana		533,460	87,688	1,078,574	514,020	778,506	1,288,892
Passion fruit		5,885,038	3,953,234	6,956,915	9,306,042	3,291,855	6,385,137
Mango		462,577	298,723	2,674,032	480,340	2,013,390	995,935
	Fresh	401,623	287,549	2,671,995	460,674	2,013,390	995,935
	Proceed	60,954	11,174	2,037	19,666	0	0
Orange		147,101	340,479	292,346	284,784	1,225,304	485,237
	Fresh	85,827	186,931	164,667	49,577	520,251	282,219
	Proceed	61,274	153,548	127,679	235,207	705,053	203,018
Papaya		14,651	5,508	6,643	231,350	1,301,371	12,597
Mandarin		25,971	21,989	8,842	18,974	588,761	97,774
Guava		26,048	8,354	28,859	62,567	102,074	20,380
	Fresh	26,048	8,354	28,859	49,843	102,074	20,380
	Proceed	0	0	0	12,724	0	0
Durian		12,454	7,926	96,634	12,943	6,710	1,857

Sources: 1. Bureau of Central Statistics, Indonesia
2. Ministry of Agriculture, Indonesia

Table 23. Export Volume of Fruits, Year 2000 – 2005 (kg)

Commodities		2000	2001	2002	2003	2004	2005
Pineapple		154,758,233	158,762,151	181,095,196	148,053,124	169,756,027	231,991,857
	Fresh	2,976,675	2,020,442	3,734,414	2,284,432	2,431,263	643,716
	Proceed	151,781,558	156,741,709	177,360,782	145,768,692	167,324,764	231,348,141
Banana		2,221,593	293,715	585,798	244,732	1,197,495	3,647,035
Passion fruit		7,182,098	4,868,528	6,512,423	9,304,511	3,045,379	8,471,508
Mango		486,760	445,967	1,574,836	584,500	1,879,664	940,556
	Fresh	430,187	423,917	1,572,634	559,224	1,879,664	940,556
	Proceed	56,573	22,050	2,202	25,276	0	0
Orange		399,299	836,204	602,253	376,542	1,297,452	773,358
	Fresh	312,984	671,628	478,531	151,753	641,227	560,038
	Proceed	86,315	164,576	123,722	224,789	656,225	247,320
Papaya		18,110	4,934	3,287	187,972	524,686	60,485
Mandarin		40,997	97,820	21,185	36,638	487,654	90,952
Guava		31,356	14,370	32,052	76,488	106,274	15,277
	Fresh	31,356	14,370	32,052	47,871	106,274	15,277
	Proceed	0	0	0	28,617	0	0
Durian		8,409	2,602	89,479	14,241	1,494	2,911

Sources: 1. Bureau of Central Statistics, Indonesia
2. Ministry of Agriculture, Indonesia

Table 24. Export Value of Various Plant, Year 2000 – 2005 (US$)

Commodities	2000	2001	2002	2003	2004	2005
Other spicy	2,177,325	989,048	995,217	1,732,172	2,523,105	4,571,059
Java tea	185,905	261,409	408,778	243,710	109,154	-
Turmerik	195,314	100,947	111,791	319,148	277,185	1,089,354
Piper Cubiba	857,346	424,168	187,003	128,348	46,798	-
Ginseng Root	7,812	17,830	0	23,178	114,085	119,064
Curry	27,881	24,211	255,458	32,680	83,042	76,028
	3,451,583	**1,817,613**	**1,918,247**	**2,279,236**	**3,153,369**	**5,855,505**

Sources: 1. Bureau of Central Statistics, Indonesia
2. Ministry of Agriculture, Indonesia

Table 25. Eksport Value Of Ornamental Plants, Year 2000 – 2005 (US$)

Commodities	2000	2001	2002	2003	2004	2005
Orchids	1,138,624	1,435,522	1,189,558	1,710,982	1,325,954	2,670,739
Cut flowers	1,683,321	1,179,715	2,956,189	2,516,870	2,670,739	2,670,739

Sources: 1. Bureau of Central Statistics, Indonesia
2. Ministry of Agriculture, Indonesia

Table 26. Export Volume of Ornamental Plants, Year 2000 – 2005 (kg)

Commodities	2000	2001	2002	2003	2004	2005
Orchids	673,115	759,378	744,732	711,344	426,113	525,487
Cut flowers	957,306	761,098	2,230,403	1,075,625	3,081,291	-

Sources: 1. Bureau of Central Statistics, Indonesia
2. Ministry of Agriculture, Indonesia

Table 27. Horticultural Production In Indonesia, Year 2000 – 2005

Commodities	Year					
	2000	2001	2002	2003	2004	2005
Ornamental Plant:						
1. Orchid (in stem)	3,260,858	4,450,787	4,995,735	6,904,109	8,027,720	7,902,403
2. Jasmine (in kg)	15,134,842	19,524,815	18,233,644	15,740,955	29,313,103	22,552,537
3. Palm (in tree)	754,067	426,964	1,189,617	668,154	530,325	791,805
Fruits : (in ton)						
1. Mango	876,027	923,294	1,402,906	1,526,474	1,437,665	1,412,884
2. Citrus	644,052	691,433	968,132	1,529,824	2,071,084	2,219,020
3. Banana	3,746,962	4,300,422	4,384,384	4,177,155	4,874,439	5,177,608
4. Mangosteen	26,400	25,812	62,055	79,073	62,117	64,711
5. Durian	236,794	347,118	525,064	741,831	675,902	566,205
Vegetables : (in ton)						
1. Shallots	772,818	861,150	766,572	762,795	757,399	732,610
2. Potatoes	977,349	831,140	893,824	1,009,979	1,072,040	1,009,819
3. Chilli	727,747	580,464	635,089	1,066,722	1,100,514	1,058,023
Medicine Plant : (in kg)						
1. Ginger	115,091,775	128,436,556	118,496,381	125,386,480	104,788,634	25,827,413
2. Koemferia	9,489,723	11,112,058	12,848,182	19,527,111	22,609,057	35,478,405
3. Alpinia	24,813,136	26,153,883	27,933,936	24,588,226	24,298,854	36,292,530
4. Turmeric	27,511,583	27,195,183	23,993,017	30,707,451	40,467,232	82,107,401
5. Zingiber Amaricans	4,484,811	4,794,449	4,530,850	4,684,297	6,025,358	8,896,585

Sources: 1. Bureau of Central Statistics, Indonesia
2. Ministry of Agriculture, Indonesia

Kind of Orchids



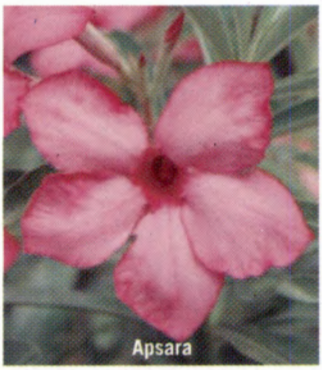


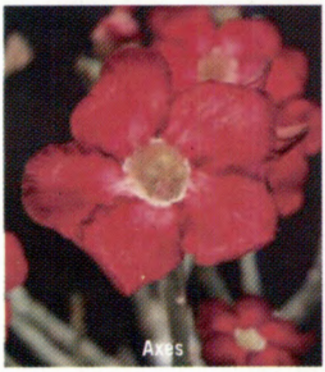



Kind of Hybrid Adenium


ADB


Aldabra


Apsara

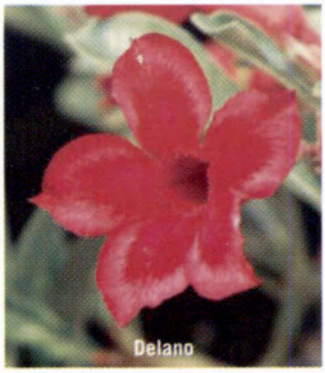

Axes


Bertha


Bright Star


Carmello


Cats Eye

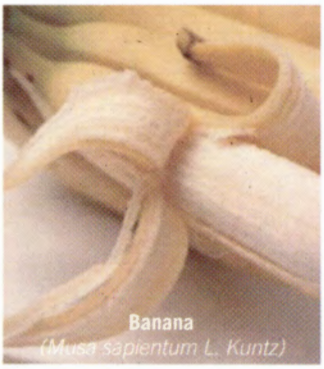

Delano


Explora


Eye of The Storm

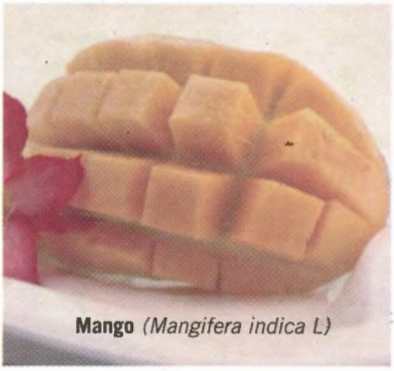

Var Red Blood

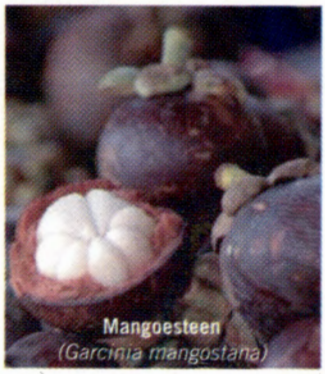
Highlights of Famous Indonesia's Fruits

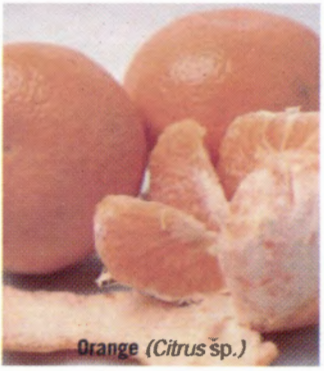

Banana *(Musa sapientum L. Kuntz)*

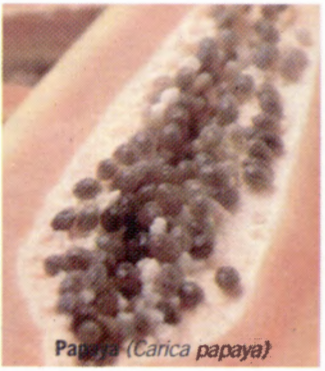

Durian *(Durio zibelhinus)*


Guava *(Psidium guajava)*


Mango *(Mangifera indica L)*


Mangoesteen *(Garcinia mangostana)*


Orange *(Citrus sp.)*


Papaya *(Carica papaya)*

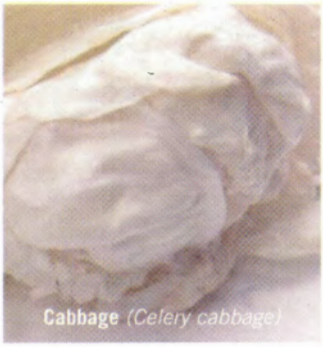

Pineapple *(Ananas comosus)*


Salacca *(Salacca zalacca)*


Starfruit *(Averrhoa carambola)*


Passionfruit *(Passiflora sp.)*

Highlights of Famous Indonesia's Vegetables


Cabbage *(Celery cabbage)*

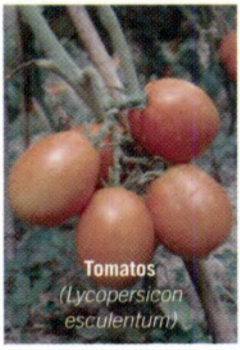

Chilli *(Capsicum annum L)*


Eggplant *(Solanum melongena)*

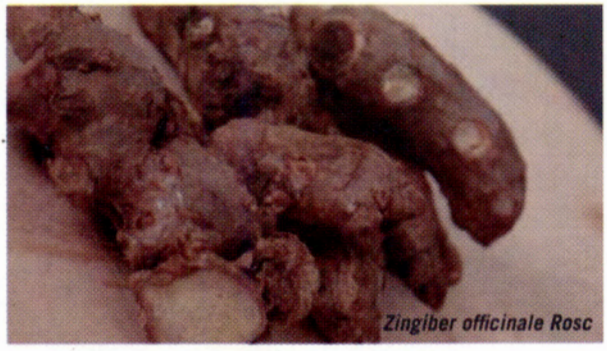

Mushroom
(Agaricus bisporus)


Potato
(Solanum tuberosum)


Shallots
(Allium ascalonicum)


Tomatos
(Lycopersicon esculentum)

Highlights of Famous Indonesia's Medicine Plant


Zingiber officinale Rosc


Curcuma domestica Val


Aloe vera

Indonesian Vanilla Grades

The vanilla is initially sorted by length then whole and split beans are separated. The quality does not depend solely on the quality of the vanillin with beans being sorted into grades also based upon aroma, appearance, moisture and oil content. Ultimately it is the aroma and flavor of the beans that determines their commercial value. Indonesian vanilla has a deep full-bodied flavor well appreciated in the American market. It is generally graded as follows:

Table 46. Acreage and Production

Year	Acreage (Ha)	Production (Ton)
2000	14,692	1,681
2001	14,749	2,198
2002	15,922	2,731
2003	15,653	1,656
2004	22,789	3,725

Source : 1. Central Bureau of Statistic, Indonesia. 2. Ministry of Agriculture, Indonesia

Table 47. Export of Vanilla 2000 - 2005

Year	Volume (Ton)	Value (000 US$)
2000	350	8,503
2001	469	19,309
2002	3,598	19,160
2003	6,363	19,275
2004	741	18,502
2005	278	5,347

Source : 1. Central Bureau of Statistic, Indonesia. 2. Ministry of Agriculture, Indonesia

Table 48. Export of Vanilla by Destination 2003 - 2005

Destination	2003		2004		2005	
	Volume (Ton)	Value (000 US$)	Volume (Ton)	Value (000 US$)	Volume (Ton)	Value (000 US$)
USA	254	10,160	81	6,937	157	2,975
Germany	27	2,402	69	3,230	62	1,795
France	9	795	9	1,502	15	104
Malaysia	6	21	570	1,992	22	32
China	6,000	3,385	-	-	0,3	17
Others	67	2,397	12	2,841	21,7	424
Total	**6,363**	**19,160**	**741**	**16,502**	**278**	**5,347**

Source : 1. Central Bureau of Statistic, Indonesia. 2. Ministry of Agriculture, Indonesia

G. Vanilla *(Vanilla plantifolia)*

There are three kind species of Vanilla in Indonesia; Vanilla planifolia Andrews, Vanilla pompana, Vanilla Tahitiensis JW Moore. The following information is specific to the Indonesian vanilla trade. Vanilla is arguably the most popular and widely used flavoring in the food industry. It is second only to saffron as the world's most expensive spice. The price takes into account the labor intensity involved in its cultivation and production. Of all the spices, the field to end product stage takes far longer for vanilla than any other spice.

Annual worldwide, vanilla pod production for a good year can reach 1800MT. Today the US is the number one buyer of vanilla followed by followed by France and Germany. Because of a shortage in crop size in Madagascar, a lot of importers turned to Indonesia to cover their shortage. This demand for beans means beans are often picked early resulting in a smaller end crop of cured vanilla (as when vanilla is cured immaturely, the yield from green to cured bean can be a half to a quarter of what could be expected from mature beans). Immature beans can require 10 to 20 kg of beans to produce 1kg of lower grade beans whereas high quality mature beans in contrast yield 1 kg of black beans for every 5 kilos of green beans.

Impact of Demand on Quality

Where there has been no shortage of vanilla in past years, Indonesia as a whole produced some very good quality beans. This was due to its unique climate and topography enabling it to harvest almost throughout the year. Also during those years, the demand and therefore cost for beans, especially immature beans, were not as high and therefore farmers were prepared to let their beans develop on the vine through to full maturity. When the worldwide crop size increases and therefore pressure on existing crops reduce, Indonesia as a whole will again produce high quality (high vanillin) bean.

Madagascar has in the past had the upper hand in the vanilla business for historical reasons. Their export quota helped them in the past to establish quality standards but since the liberation of the trade the quality hasn't stopped dropping. Political and financial manipulation in recent years has greatly hurt the trade.

Centre of Production

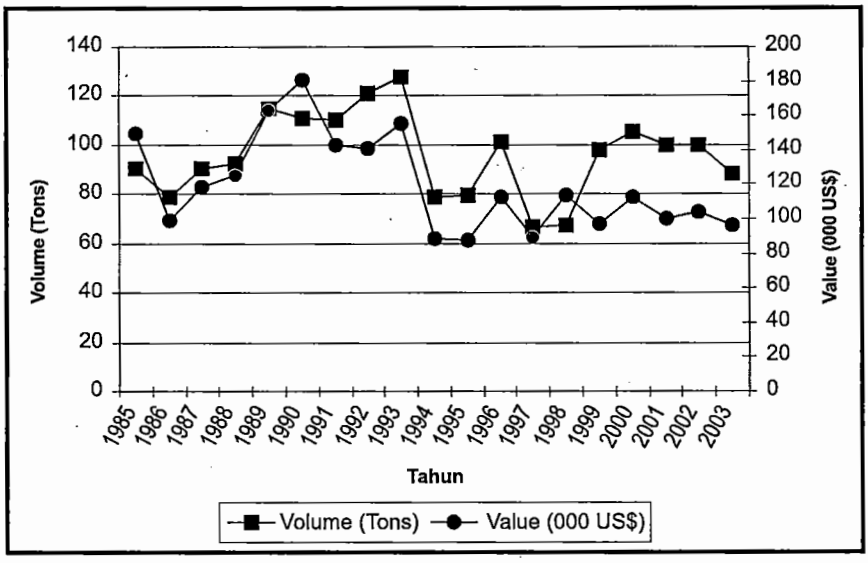
In almost every region in Indonesia but some regions are more industrial than others. In order of importance are: Flores, Manado, Bali/Lombok, Sumatra and Java. Vanilla is predominantly sourced from islands west of Flores. The maturity time varies from year to year but harvest is generally situated from May to July depending on the region, in Medan and Manado there is also a December crop (smaller than summer crop but still substantial).

Biomedicine

Some functional components of tea possess multiform functions including anti-caries, blood-pressure depressing, blood-glucose depressing, blood-lipid reducing, anti oxidant, immune function improving, diuretic and anti carcinogenic.

Trade, Price, and Export Development

The development of Indonesian tea export from 1985 to 2003 is shown in Graph 1. The volume of Indonesian tea export fluctuated in terms of volume as well as value due to the impact of world markets and domestic tea production. Indonesian tea exported in 2003 amounted 88,175 tons, a sharp decrease when compared to the 2000 export of 105,581 tons. Therefore, market share of Indonesian tea in the world market fell from 7.9% in 2000 to 6.4% in 2003. In 2003, Indonesia ranked as the fifth largest world tea exporter.



The development of Indonesian tea export in term of volume and value

Association

Some associations of Indonesian tea are established to strive the interest of the members as well as the partner of the government in national tea development program. These associations are: Indonesian Tea Association (ITA), ASPHATINDO (Asosiasi Pengusaha Teh Indonesia/*Indonesian Tea Industrialist Association*), KOPTINDO (Koperasi Teh Indonesia/*Indonesian Tea Cooperation*), APTEHINDO (Asosiasi Petani Teh Indonesia/*Indonesian Tea Smallholder Association*). ITA as the biggest tea association in Indonesia was founded in 1978. Nowadays ITA has 137 members, which consists of planters, traders, buying agents, processors, blenders and exporters.

Beverages

Package tea

Package tea is the bulk tea, which are blended and packed into several ways such as paper cardboard, aluminum or plastics bag, sachet, canning, and woody packages. Some branded package teas are available with specific taste for black tea, green tea, oolong tea, and jasmine tea. The market segment of package tea in Indonesia is dominated by jasmine tea package.

Ready to drink (RTD) tea

Ready to drink teas are available in domestic market as bottle tea, tetra pack tea, teacup, canning tea and tea syrup. In addition to original tea taste of black tea, green tea or jasmine tea, the RTD teas are also sold with various fruity flavors and carbonated tea. Teenager's consumer is the prominent market segment of RTD tea.

Tea bag

Tea bag is sequel product of tea packed in small paper bag for easier serving. Tea bag is able to raise domestic tea consumption of all market segments. Nowadays, tea bags are available for black tea, green tea, and jasmine tea. Apart from original taste, tea bags are also sold in various flavors such as pruit, vanilla, mint, pandan, and flowery taste.

Instant tea

In domestic market, instant tea are available in several packaging such as sachet, aluminum and glass bottle with various taste such as lemon, tamarin and other fruity flavors.

Tea candy

Tea candies with original taste of tea as well as milk or mint flavor are available.

Food

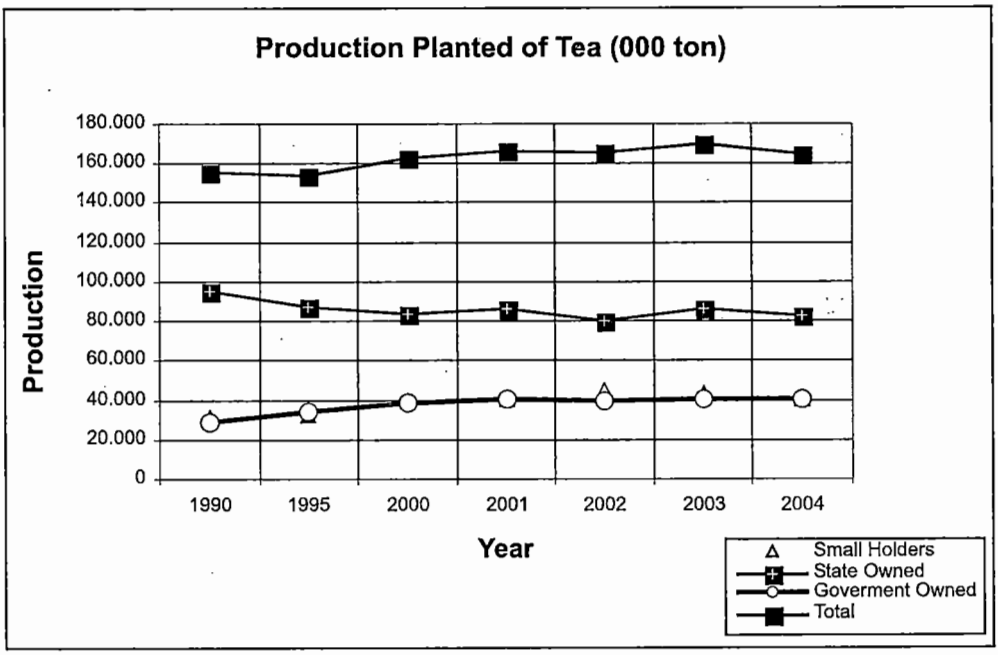
Various food with tea flavors are available such as cake, ice cream, biscuit, pudding, green tea pie, chips, as well as traditional culinary.

Cosmetics

Some cosmetic products with tea as main raw material are produced such as bath soap, face lotion, eye lotion, anti aging lotion, foundation, whitening cream, milk cleanser, astringent, shampoo, hair tonic, cream bath lotion, hand body, air freshener, green tea spa, massage lotion, aroma therapy and perfume.

Area and Production

In Indonesia, in 2003, tea plantations cover an area of 153,217 ha consisting of 67,667 ha smallholder (44.2%), 44,633 ha state owned (29.1%), and 39,917 ha private owned plantation (26.1%). Meanwhile the Indonesia tea production has reached 168,053 tons or 5.4% of the total world production (3.1 million tons). The contribution share of state owned plantations toward the total tea production reached 48.3%, whereas smallholder and private owned plantations shared 26.7% and 25%, respectively. The difference in productivity figures of the above mentioned groups is caused by the existence of difference in the capability to apply the right technology for crop cultivation.



Source: Directorate General of Estates Crops

Downstream Industry

Tea is not only a stimulating beverage, but is also known for its medicinal properties for human health. According to the research result, tea has some tremendous beneficial such as immune function improving, diuretic, blood-lipid reducing, detoxicating, antimutagenic, and anticarcinogenic.

In compliance with the finding of medicinal beneficial, tea downstream industry starts to develop some product diversification. The industry is developing rapidly as the private sector involved. Based on its functional and beneficial, tea is classified as beverages as well as non-beverages.

Brief Historical

Tea seeds were first introduced into Indonesia (then the Dutch East Indies) in 1684 from Japan, by a German named Andreas Cleyer. In 1878 the first Assam tea seeds were imported from Sri Lanka by R.E. Kerkhoven, and planted at Gambung, West Java. The tea industry in Java developed steadily. In 1910 The Assam tea plantations were established in North Sumatra, followed by plantations in West Sumatra and Southern Sumatra. Black tea exported in 1939 totaled to an amount of 73,541 tons (van Emden and Deijs, 1949).

The Dutch Government started to pay attention to smallholder tea in around 1900. The Government tried to enhance production by employing extension workers, by subsiding the price of Assam tea seeds, and by conducting demonstration of pruning and plucking methods. In 1897 the tea industry decided that research was needed, a research unit for this purpose was then established. In 1902, this unit was expanded to become the Tea Research Institute.

In 1958 the Government of the Republic Indonesia nationalized plantations owned by Dutch companies and turned them into Government owned/State Plantations. The Research Institute of West Java became the Research Institute of the Centrale Proefstation Vereniging (CPV), later became the Research Institute of Estate Crops (RIEC), Bogor.

Agroclimatic Condition

Indonesia has a monsoonal climate, influenced by the Australian and Asian continents. The rainfall of tea districts is above 2,500 mm per annum. Certain locations have more than 5,000 mm. As tea is sensitive to drought, there should be less than two dry months (months with less than 60 mm rainfall) annually, and no months with no rain falls.

Few records have been kept to show sunshine in tea plantations. The average daily sunshine varies from 1.7 hours in January (rainy season) to 6.2 hours in July (dry season). The less sunshine there is, the less the tea leaves grow thus decreasing the tea quality. In Java the sunshine is least in January - February (the rainy season). On the other hand, during the dry season the growth of the tea may be detrimentally affected by drought.

Organic materials are used to stabilize the supply of inorganic fertilizers. According to the result of soil survey on the most suitable soil for tea, the potential area in some provinces is still 93,000 ha, that can be opened for tea cultivation.

Rotating drums complete the drying process. Green tea is primarily used as a raw material for scented tea or jasmine tea. This type of green tea is exported to North Africa and Middle East.

Center of production: West Java and Centre of Java.

Special product : Malabar tea and organic tea (Skal Certification).

Table 43. Acreage and Production of Tea

Year	Acreage (Ha)	Production (Ton)
2000	153,675	162,587
2001	150,872	166,867
2002	150,707	165,194
2003	143,604	169,821
2004	142,766	164,445

Source : 1. Central Bureau of Statistic, Indonesia. 2. Ministry of Agriculture, Indonesia

Table 44. Export of Tea during 2000 - 2005

Year	Volume (Ton)	Value (000 US$)
2000	105,581	112,106
2001	99,797	99,965
2002	100,185	103,426
2003	88,176	95,816
2004	98,572	116,220
2005	102,294	121,496

Source : 1. Central Bureau of Statistic, Indonesia. 2. Ministry of Agriculture, Indonesia

Table 45. Export of Tea by Destination 2003 - 2005

Destination	2003		2004		2005	
	(1000 Ton)	(US$ Million)	(1000 Ton)	(USS Million)	(1000 Ton)	(USS Million)
Fed. Rusia	11,242	11,094	7,245	7,257	18,415	19,478
England	12,657	13,949	5,808	5,716	13,836	14,960
Pakistan	7,582	7,834	5,071	5,838	12,592	14,674
Malaysia	7,971	6,946	7,971	6,946	9,902	10,884
Germany	6,207	5,075	6,919	5,905	7,371	6,957
Others	42,517	51,918	65,558	84,558	40,178	54,543
Total	**88,176**	**96,816**	**98,572**	**116,220**	**102,294**	**121,496**

Source : 1. Central Bureau of Statistic, Indonesia. 2. Ministry of Agriculture, Indonesia

75.6% of total production and the rest is green tea (24.4%). A major quantity of black tea is manufactured by the orthodox method (67.9% of total production) and CTC method (7.7% of total production) method.

Orthodox tea

Most of tea factories produce orthodox black tea. The leaves are withered in withering troughs. Withered leaves are rolled in combinations of open top roller, press rollers, rotor vane, and continuous roller. Drying is done by ECP dryer or in FBD.

Generally, tea is sold in multi wallpaper sacks of 80 kg. Indonesian black tea has more "geraniol' than other tea, while "geraniol" is the main component of tea aroma and constitute specific mild and fine aroma.

CTC tea

To provide more choices and meet the demand of tea buyers, and also in response to the increasing demand for tea bags, CTC processing was commenced in 1986. CTC processing uses a continuous system. Conditioning is in Barbora leaf conditioner. The CTC machines are triplex ones, fermentation in a continuous fermenting machine, and drying in a FBD.

Scented or Jasmine Tea

Almost all scented tea factories are located at the northern coast of Central Java, where jasmine is grown. To scent green tea, blossoms of two species of jasmine are used, *Jasminum ofcinale* var. *granditlorum* and *J. sambac*, and some *Aglaia odorata* in West Java. In the processing of modern scented tea factories use rotary dryer with oil burners to dry the green tea, and redry the scented tea in the ECP dryer. The proportion of jasmine blossom and green tea for scented tea production is one to ten. This varies according to the quality of the flowers, and season, in which blossoms during the dry season are more fragrant than those of the rainy season.

Japanese green tea

Several tea plantations cultivate cinensis tea imported from Japan, and process the leaves to produce Japanese green tea (steam withered), and exported to Japan. The export volume of Japanese green tea is gradually increasing due to the accepted by the consumers of its taste and quality.

Chinese green tea

Several factories produce green tea of the pan-fired Chinese type from Assam tea leaves. Fresh leaf is directly withered in rotating drums to inactivate the enzymes. The withered leaf is rolled in rollers, then half-dried in ECP dryer.

Table 42. Rubber Export by Destination

Country	2003		2004		2005	
	(1000 Ton)	(US$ Million)	(1000 Ton)	(USS Million)	(1000 Ton)	(USS Million)
USA	597,945	539,700	736,012	627,284	669,120	852,029
Japan	228,553	212,458	225,213	263,537	260,604	329,016
Singapore	79,060	70,503	85,590	96,053	115,084	143,752
South Korea	76,893	67,443	76,793	86,977	74,813	96,321
Germany	73,313	66,009	71,808	83,231	61,974	80,302
Others	605,175	529,352	677,510	1,004,122	842,186	1,081,127
Total	1,660,939	1,485.465	1,872,926	2,161,204	2,023,781	2,582,547

Source : 1. Central Bureau of Statistic, Indonesia
2. Ministry of Agriculture, Indonesia

F. Tea *(Camelia sinensis)*

Tea seeds were first introduced into Indonesia (then the Dutch East Indies) in 1684 from Japan, by a German named Andreas Cleyer. In 1878 the first Assam tea seeds were imported from Sri Lanka by R.E. Kerkhoven, and planted at Gambung, West Java. The tea industry in Java developed steadily. In 1910 The Assam tea plantations were established in North Sumatra, followed by plantations in West Sumatra and Southern Sumatra. Black tea exported in 1939 totaled to an amount of 73,541 tons (van Emden and Deijs, 1949).

The Dutch Government started to pay attention to smallholder tea in around 1900. The Government tried to enhance production by employing extension workers, by subsiding the price of Assam tea seeds, and by conducting demonstration of pruning and plucking methods. In 1897 the tea industry decided that research was needed, a research unit for this purpose was then established. In 1902, this unit was expanded to become the Tea Research Institute.

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Types of Tea Bulk

Indonesian tea production consist Of 50% medium grown tea, 39% low grown tea and 20% high grown tea.

Types of tea produced by the industry in Indonesia consist of black, green and jasmine scented tea. Most of Indonesian tea production is black tea around

Rubber plantations were slow to establish themselves, although they operated in Indonesia by 1861. A worldwide 'rubber boom' started with the invention of the pneumatic tire in 1888, followed by the introduction of motorized vehicles at the turn of the century. Investments came pouring into Southeast Asian plantations by 1905, led by tire makers Goodyear, Dunlop and Michelin. The hub of natural rubber production had rapidly shifted from the Americas to Southeast Asia, and remains in the region today, largely in Thailand, Malaysia and Indonesia.

Centre of production: North Sumatera, Riau, Jambi, South Sumatera, West Kalimantan, and East Kalimantan.

Table 40. Acreage and Production of Rubber, 2000 - 2004

Year	Acreage (000 Ha)	Production (000 Ton)
2000	3,372.4	1,501.4
2001	4,116.6	2,281.6
2002	4,216.0	2,323.0
2003	4,308.9	2,202.8
2004*	4,328.4	2,207.5

Source : 1. Central Bureau of Statistic, Indonesia
2. Ministry of Agriculture, Indonesia

Kinds of product: RSS (Rubber Smoke Sheet), slab, SIR (Standar Indonesian Rubber), latex, and crepe.

Table 41. Export of Rubber 2000 - 2005

Year	Total (000 Ton)	Value (US$ million)
2000	1,379.6	888.6
2001	1,453.4	786.2
2002	1,496.0	1,037.6
2003	1,660.9	1,485.5
2004	1,874.3	2,180.0
2005	2,023.8	2,582.5

Source : 1. Central Bureau of Statistic, Indonesia
2. Ministry of Agriculture, Indonesia

Table 38. Export of Coffee, 2000 - 2005

Year	Volume (000 Ton)	Value (Milion US$)
2000	339.201	318.895
2001	250.817	188.492
2002	325.010	223.917
2003	323.904	259.107
2004	349.177	294.114
2005	445,930	504,407

Source : 1. Central Bureau of Statistic, Indonesia 2. Ministry of Agriculture, Indonesia

Table 39. Coffee Export by Destination 2002 - 2005

Destination	2002		2003		2004		2005	
	Volume (Ton)	Value (000 US$)	Volume (Ton)	Value (000 US$)	Volume (Ton)	Value (000 US$)	Volume (Ton)	Value (000 US$)
USA	43,243	50,769	48,239	55,177	34,448	43,970	84,426	137,394
Germany	53,563	28,862	57,609	37,689	53,967	37,733	78,755	78,167
Japan	49,039	41,574	52,721	48,954	55,141	57,242	49,936	64,610
Italy	15,011	8,950	25,087	17,959	21,348	15,256	30,500	27,652
Singapore	15,267	9,116	8,935	7,059	10,562	9,712	13,312	20,670
Others	148,887	86,646	131,313	92,269	173,71	130,201	189,001	175,914
Total	325,010	223,917	323,904	259,10	349,177	294,114	445,930	504,470

Source : 1. Central Bureau of Statistic, Indonesia 2. Ministry of Agriculture, Indonesia

E. Natural Rubber *(Hevea brasiliensis)*

Rubber was first found by the Aztecs in Mexico, Incas in Peru and by tribes in the Amazon basin, being initially used for balls in ritualistic games, figurines for worship and as incense. Rubber was 'discovered' by Christopher Columbus, taken back to Europe and, by the 18th century, used in the production of consumer products including tarpaulins, diver suits and water bottles.

Around 1840, rubber tree seeds were gathered in the Amazon Basin, sent to England for germination and redistributed to South and Southeast Asia starting in Ceylon (present - day Sri Lanka and into the Malayan Peninsula.

Kalossi is the small town in central Sulawesi which serves as the collection point for the coffee and Toraja is the mountainous area in which the coffee is grown. Celebes exhibits a rich, full body, well-balanced acidity (slightly more than Sumatra) and is multi-dimensional in character. It has dark chocolate and ripe fruit undertones. It is an excellent coffee for darker roasting. Because of it's semi-dry processing, it may roast a bit unevenly, but don't cull the odd beans-they add to the complexity of the cup.

"Ethical coffee" a number of classifications are used to label coffee produced under certain environmental or labor standards. So-called *ethical coffee* is produced or traded under specific conditions and guidelines, which are generally more environmentally friendly or economi.

- *Bird-friendly* or *shade-grown* coffee is produced in regions where natural shade (canopy trees) is used to shelter coffee plants during parts of the growing season. These shade cycles are said to be better for the coffee. Purchases of this coffee blend may also take place to support environmentally friendly coffee farms.
- *Organic* coffee is produced under strict certification guidelines, and is grown without the use of potentially harmful artificial pesticides or fertilizers.
- *Fair Trade* Coffee is produced by small coffee producers; guaranteeing for these producers a minimum price.
- Geographic Indication Coffee is now under validation procedure, actually for Coffee cultivated in Bali Province, managed by Subak Abian, one of Bali etnic group. Land is cultivated with specific treatment expessing a unity of human and nature.

Table 37. Acreage and Production of Coffee 2000 - 2004

Year	Acreage (000Ha)	Production (000Ton)
2000	1,260.7	554.6
2001	1,313.4	569.2
2002	1,372.2	682.0
2003	1,381.7	663.6
2004	1,252.0	634.9

Source : Ministry of Agriculture, Indonesia

D. Coffee *(Coffea canephora)*

There are two main species of the **coffee plant.** *Coffea arabica* is the older of them. It is thought to be indigenous to Ethiopia, but as the name implies it was first cultivated on the Arabian Peninsula. It is more susceptible to disease, and considered by professional cuppers to be greatly superior in flavor to *Coffea canephora (robusta)*, which contains about twice as much caffeine—a natural insecticide (paralyzes and kills some of the insects that attempt to feed on the plant) and stimulant— and can be cultivated in environments where *arabica* will not thrive.

Arabica coffees were traditionally named by the port they were exported from, the two oldest being Mocha, from Yemen, and Java, from Indonesia. The modern coffee trade is much more specific about origin, labeling coffees by country, region, and sometimes even the producing estate. Coffee aficionados may even distinguish auctioned coffees by lot number.

One unusual and very expensive variety of robusta is the Indonesian *kopi luwak* and the Philippine *Kape Alamid.* The beans are collected from the droppings of the Common Palm Civet, whose digestive processes give it a distinctive flavor.

Coffee has been planted in Indonesia since the Dutch colonialism and it was firstly introduced in 1696 with type of Arabica Linneaus. Most of Indonesian plantation is cultivated by the small farmers, a small part cultivate both by private sector as well as state owned estate. Coffee has a strategic position in Indonesian economy since it is as a source of livelihoods for millions of smallholder; foreign exchange earning, accelaration regional development; and downstream of coffee base industry.

Indonesian coffee is dominated by robusta (93 percent), while arabica is 7%. Indonesia is the second largest producers of robusta coffee after Vietnam. Indonesia try to increase arabica production in order to anticipate the world coffee demand that is dominated by arabica coffee.

Some well-known arabica coffees include:

- Sumatra Mandheling and Sumatra Lintong — Mandheling is named for the Mandheling region outside Padang in West Sumatra, Indonesia. Contrary to its name, no coffee is actually produced from the "Mandheling region," and "Sumatra Mandheling" is used as a marketing tool by Indonesian coffee producers. Lintong on the other hand, is named after the Lintong district, located in North Sumatra.
- Sulawesi Toraja Kalossi - Grown at high altitudes on the island of Sulawesi (formerly Celebes) in the middle of the Malay archipelago in Indonesia.

Table 34. Acreage and Production of Coconut

Year	Acreage (Ha)	Production (Ton)
2000	3,691,414	3,044,528
2001	3,897,467	3,163,018
2002	3,884,950	3,098,496
2003	3,913,130	3,254,854
2004	3,872,091	3,304,002

Source : 1. Central Bureau of Statistic, Indonesia. 2. Ministry of Agriculture, Indonesia

Table 35. Export of Coconut 2000 -2005

Year	Volume (Ton)	Value (000 US$)
2000	828,210	366,279
2001	470,387	159,288
2002	568,520	214,562
2003	466,146	192,976
2004	546,676	304,374
2005	920,061	488,034

Source : 1. Central Bureau of Statistic, Indonesia. 2. Ministry of Agriculture, Indonesia

Table 36. Coconut Export by Destination 2002 - 2005

Destination	2002		2003		2004		2005	
	Volume (Ton)	Value (000 US$)	Volume (Ton)	Value (000 US$)	Volume (Ton)	Value (000 US$)	Volume (Ton)	Value (000 US$)
Netherlands	136,567	42,360	56,881	20,115	113,487	66,910	251,932	136,441
Malaysia	84,893	40,416	81,954	31,053	139,912	1,356	173,167	78,585
Singapore	66,500	37,484	55,994	29,210	37,721	21,205	69,458	46,135
USA	38,177	16,342	20,198	8,853	39,141	24,304	120,551	68,341
Korea	20,659	7,320	36,987	14,060	292	95	461	204
others	221,774	65,640	214,132	89,685	216,123	120,504	304,492	329,706
Total	568,520	214,562	466,146	192,976	546,676	304,374	920,061	329,706

Source : 1. Central Bureau of Statistic, Indonesia. 2. Ministry of Agriculture, Indonesia

- Coconut cream is what rises to the top when coconut milk is refrigerated and left to set.
- The leftover fibre from coconut milk production is used as livestock feed.
- The sap derived from incising the flower clusters of the coconut is fermented to produce palm wine, also known as "toddy" or, in the Philippines, *tuba*.
- Apical buds of adult plants are edible and are known as "palm-cabbage" (though harvest of this kills the tree).
- The interior of the growing tip may be harvested as heart-of-palm and is considered a rare delicacy. Harvesting this also kills the tree. Hearts of palm are often eaten in salads; such a salad is sometimes called "millionaire's salad".
- The coir (the fibre from the husk of the coconut) is used in ropes, mats, brushes, caulking boats and as stuffing fibre; it is also used extensively in horticulture for making potting compost.
- Copra is the dried meat of the seed which is the source of coconut oil.
- The leaves provide materials for baskets and roofing thatch.
- The husk and shells can be used for fuel and are a good source of charcoal.
- Hawaiians hollowed the trunk to form a drum, a container, or even small canoes.
- The wood can be used for specialized construction (notably in Manila's Coconut Palace).
- The stiff leaflet midribs make cooking skewers, kindling arrows, or bound into bundles, brooms and brushes.
- The roots are used as a dye, a mouthwash, or a medicine for dysentery. A frayed-out piece of root makes a poor man's toothbrush.
- Half coconut shells are used in theatre, banged together to create the sound effect of a horse's hoofbeats. They were also used in this way in the Monty Python film Monty Python and the Holy Grail.
- Dried half coconut shells are used to buff floors.
- In fairgrounds, a "coconut shy" is a popular target practice game, and coconuts are commonly given as prizes.
- A coconut can be hollowed out and used as a home for a rodent or small bird.
- Coconut water can be used as an intravenous fluid (see PMID 10674546).
- Fresh inner coconut husk can also be rubbed on the lens of snorkling goggles to prevent fogging during use
- Dried half coconut shells are used as the bodies of musical instruments, including the Chinese yehu and banhu, and the Vietnamese dàn gáo.

Kinds of product*: coconut milk, copra, charcoal, and coco peat active carbon.*

The essential oil of cloves has anesthetic and antimicrobial qualities, and is sometimes used to eliminate bad breath or to ameliorate the pain of a bad tooth. It, or its main component eugenol, is used by dentists to calm the nerve inside a tooth after the removal of deep decay, and is the characteristic odour of a dentist's office. *Clove* oil is used in the traditional blend of choji (1% *clove* oil in mineral oil) and is applied to Japanese sword blades to prevent tarnishing of the polished surface.

C. Coconut *(Cocos nucifera)*

The coconut palm (*Cocos nucifera*), is a member of the family Arecaceae (palm family). It is the only species in the Genus *Cocos*, and is a large palm, growing to 30 m tall, with pinnate leaves 4-6 m long, pinnae 60-90 cm long; old leaves break away cleanly leaving the trunk smooth. The term *coconut* refers to the fruit of the coconut palm.

The origin of this plant are the subject of controversy with some authorities claiming it is native to southeast Asia, while others claim its origin is in northwestern South America. Regardless of its origin, the coconut has spread across much of the tropics, probably aided in many cases by sea-faring peoples. The fruit is light and buoyant and presumably spread significant distances by marine currents: fruits collected from the sea as far north as Norway have been found to be viable (subsequently germinated under the right conditions). In the Hawaiian Islands, the coconut is regarded as a Polynesian introduction, first brought to the Islands by early Polynesian voyagers from their homelands in the South Pacific.

Uses of the various parts of the palm include:

- The white, fleshy part of the seed is edible and used fresh or dried (desiccated) in cooking.
- The cavity is filled with "coconut water" containing sugars, fibre, proteins, anti-oxidants, vitamins and minerals, which provide excellent isotonic electrolyte balance, and an exceptional nutritional food source, which is why it is used as a refreshing drink throughout the humid tropics. It is also used in the making of the gelatinous dessert nata de coco. Mature fruits have significantly less liquid than young immature coconuts. Coconut water is sterile until the coconut is opened (unless the coconut is spoiled).
- Sport fruits are also harvested, primarily in the Philippines, where they are known as *macapuno.*
- Coconut milk (which is approximately 17% fat) is made by processing grated coconut with hot water or hot milk which extracts the oil and aromatic compounds from the fibre.

in the year 1770; subsequently the cultivation was introduced into Guiana, Brazil, most of the West Indies, and Zanzibar, where the majority of cloves today are grown.

In Britain in the 17th and 18th centuries, cloves were worth at least their weight in gold, due to the high price of import.

Center of production: North Sulawesi, Center of Sulawesi, South Sulawesi, and East Java.

Table 31. Acreage and Production of Clove

Year	Acreage (Ha)	Production (Ton)
2000	417,598	59,878
2001	429,300	72,685
2002	430,212	79,009
2003	442,333	117,683
2004	429,997	111,399

Source : 1. Central Bureau of Statistic, Indonesia. 2. Ministry of Agriculture, Indonesia

Table 32. Export of Clove 2000-2005

Year	Volume (Ton)	Value (000 US$)
2000	4,655	8,281
2001	6,324	10,669
2002	9,399	25,973
2003	15,688	24,929
2004	3,060	10,761
2005	9,683	14,916

Source : 1. Central Bureau of Statistic, Indonesia. 2. Ministry of Agriculture, Indonesia

Table 33. Clove Export by Destination 2002 - 2005

Destination	2002		2003		2004		2005	
	Volume (Ton)	Value (000 US$)	Volume (Ton)	Value (000 US$)	Volume (Ton)	Value (000 US$)	Volume (Ton)	Value (000 US$)
India	990	2,508	3,652	5,949	4,061	7,028	1,966	4,132
Singapore	4,470	14,245	4,941	8,162	2,288	4,594	1,468	3,528
Saudi Arabia	211	552	1,901	3,136	390	1,008	724	2,120
USA	172	463	237	423	214	408	258	606
Vietnam	334	872	1,751	2,977	216	239	1,103	1,072
Other	3,222	7,333	3,206	4,282	1,891	2,760	4,164	3,458
Total	**9,399**	**25,973**	**15,688**	**24,929**	**9,060**	**16,037**	**9,683**	**14,916**

Sources: Bureau of Central Statistics, Indonesia Ministry of Agriculture, Indonesia

B. Clove *(Eugenia aromaticum)*

Cloves (*Syzygium aromaticum*, syn. *Eugenia aromaticum*) are the aromatic dried flower buds of a tree in the family Myrtaceae. It is native to Indonesia and used as a spice in virtually all the world's cuisine. The name derives from French *clou*, a nail, as the buds vaguely resemble small irregular nails in shape. Cloves are harvested primarily in Indonesia and Madagascar; it is also grown in Zanzibar, India, Sri Lanka, and the "Spice Islands" (Moluccas, Indonesia known as the Bandas Islands).

Cloves (*Syzygium aromaticum*, syn. *Eugenia aromaticum*) are the aromatic dried flower. The clove tree is an evergreen which grows to a height ranging from 10-20 m, having large oval leaves and crimson flowers in numerous groups of terminal clusters. The flower buds are at first of a pale color and gradually become green, after which they develop into a bright red, when they are ready for collecting. Cloves are harvested when 1.5-2 cm long, and consist of a long calyx, terminating in four spreading *sepals*, and four unopened petals which form a small ball in the centre.

Uses

Cloves can be used in cooking either whole or in a ground form, but as they are extremely strong they are used sparingly. The spice is used throughout Europe and Asia and is smoked in cigarettes (also known as kreteks) in Indonesia and in occasional coffee bars in the West, mixed with marijuana to create marijuana spliffs. Cloves are also an important incense material in Chinese and Japanese culture. Clove essential oil is used in aromatherapy and oil of cloves is widely used to treat toothache in dental emergencies

History

In the 4th century BC, Chinese leaders in the Han Dynasty required those who addressed them to chew cloves so as to freshen their breath. Cloves, along with nutmeg and pepper, were highly prized in Roman times, and Pliny the Elder once famously complained that "there is no year in which India does not drain the Roman Empire of fifty million sesterces". Cloves were traded by Arabs during the Middle Ages in the profitable Indian Ocean trade. In the late 15th century, Portugal took over the Indian Ocean trade, including cloves, due to the Treaty of Tordesillas with Spain and a separate treaty with the sultan of Ternate. The Portuguese brought large quantities of cloves to Europe, mainly from the Maluku Islands. Clove was then one of the most valuable spices, a kg of which costing around 7 g of gold.

The trade later became dominated by the Dutch in the 17th century. With great difficulty the French succeeded in introducing the clove tree into Mauritius

Table 28. Acreage and Production of Pepper 2000 – 2005

Year	Acreage (Ha)	Production (Ton)
2000	150,531	69,087
2001	186,022	82,078
2002	204,068	90,181
2003	204,364	90,740
2004	209,572	94,371
2005		

Source : Ministry of Agriculture of Indonesia

Table 29. Export of Pepper 2000 – 2005

Year	Volume (Ton)	Value (000 US$)
2000	65,011	221,090
2001	54,596	101,133
2002	63,214	89,917
2003	51,546	93,445
2004	32,369	55,637
2005	34,531	58,437

Sources: 1. Bureau of Central Statistics, Indonesia
2. Ministry of Agriculture, Indonesia

Table 30. Pepper Export by Destination 2002 - 2005

Destination	2002		2003		2004		2005	
	Volume (Ton)	Value (000 US$)	Volume (Ton)	Value (000 US$)	Volume (Ton)	Value (000 US$)	Volume (Ton)	Value (000 US$)
Singapore	95	100	18,080	40,645	9,239	18,860	10,065	21,797
USA	16,286	26,137	17,738	27,238	7,477	11,284	13,209	18,208
Netherland	2,379	4,396	3,086	4,828	898	1,936	1,945	3,918
Japan	-	-	1,098	2,730	1,126	2,770	1,318	2,771
India	2,009	4,066	3,210	4,321	2,552	3,048	2,150	2,582
Other	42,446	54,448	47,460	13,683	11,075	17,739	5,844	9,161
Total	**63,214**	**89,147**	**51,546**	**93,445**	**32,369**	**55,637**	**34,531**	**58,437**

Sources: Bureau of Central Statistics, Indonesia
Ministry of Agriculture, Indonesia

III. ESTATE CROPS

A. Pepper (*Piper nigrum*)

Other names: **Pepper**; white **pepper**; green peppercorns.

Description: black pepper *(Piper nigrum),* the king of spices, is one of the oldest and the most popular spice in the world. The pepper plant is a perennial woody vine growing to four metres in height on supporting trees, poles, or trellises. It is a spreading vine, rooting readily where trailing stems touch the ground. The leaves are alternate, entire, five to ten centimetres long and three to six centimetres broad. The flowers are small, produced on pendulous spikes four to eight centimetres long at the leaf nodes, the spikes lengthening to seven to 15 centimetres as the fruit matures.

History

Pepper has been used as a spice in India since prehistoric times. It was probably first cultivated on the Malabar coast of India, in what is now the state of Kerala. Peppercorns were a much prized commodity, often referred to as black gold and used as a form of money. The term peppercorn rent still exists today. Black pepper was widely cultivated in the tropics of Southeast Asia, one of them is Indonesia. Well-known types of pepper from Indonesia are Lampung pepper from Sumatra island and white Muntok pepper from Bangka Island

Production

Indonesia is the second largest producer after Vietnam. There are six cultivars commonly grown in Indonesia, namely Bulok Belantung, Jambi, Kerunci, Lampung Daun Lebar (LDL), Bangka (Muntok) and Lampung Daun Kecil. Lampung Pepper, from Indonesia, is the most common variety of black pepper in use in the United States--with some competition from Penang pepper and Singapore pepper. Alleppi pepper, Mangalore, and Tellicherry pepper are higher grades of pepper from India -- their higher cost is justified by their more complex and aromatic scent. Other varieties of note include Pepper from Madagascar, Siam (Thailand) and Saigon (Vietnam) -- note that out-dated place-names are still used to identify these products. Most white pepper is made from Muntock pepper, a variety grown on Bangka, an island near Sumatra. Sarawak pepper is used to a lesser extent. It is grown in northern Borneo.

Center of Production : Lampung, Bangka, and Belitung.

Kinds of Products : Ground , powder, crushed

Estate Crops Products

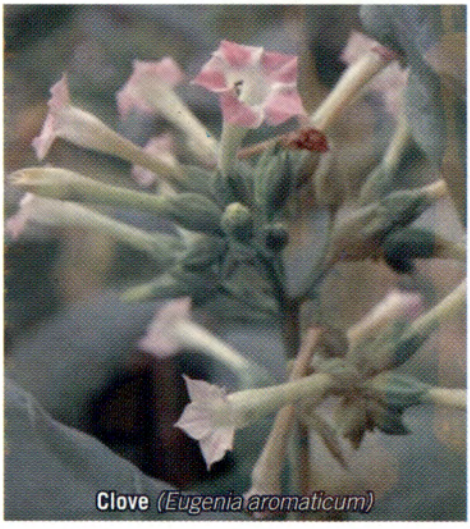

Black Papper

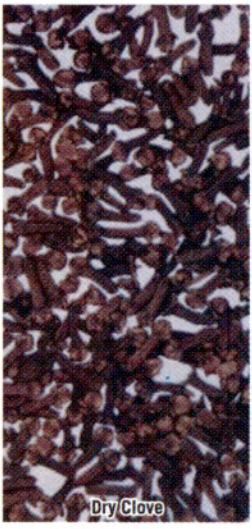

White Papper


Pepper *(Piper nigrum)*


Black Papper Powder


White Papper Powder


Clove *(Eugenia aromaticum)*

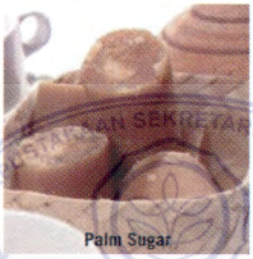

Dry Clove

Clove Balm


VCO


Deficated Coconut


Coconut *(Cocos nucifera)*


Palm Sugar


nata de coco

Estate Crops Products


Mix Coffee Powder


Coffee bean


Coffee *(Coffea canephora)*


Natural Rubber *(Hevea brasiliensis)*


Latex


Black Tea


Green Tea


Tea


Vanili Grain


Drain Vanili


Vanilla *(Vanilla planifolia)*

H. Cocoa (*Thebroma cacao* L.)

Cocoa (Thebroma cacao L.) has been planted in Indonesia since the Dutch colonialism. 70 percent of Indonesian cocoa plantation is cultivated by the smallholder farmers, 30 percent cultivate by private plantation and government owned plantation. Cocoa commodity has a strategic position in Indonesia economic, as a source of livelihoods for millions of smallholder and downstream of cocoa base industry, foreign exchange earning, and accelaration regional development.

Centre of Cultivation: South Sulawesi, Central Sulawesi, and South East Sulawesi.

Products: Cocoa Bean, Cocoa Butter, Cocoa Powder, Akalized Cocoa, High Fat Cocoa Powder, Cocoa paste, Cocoa Cake, Chocolate.

Table 49. Export Cocoa 2000 - 2005

Year	Export	
	Volume (ton)	Value (US$000)
2000	424,088	341,859
2001	298,686	287,509
2002	459,239	701,034
2003	357,737	623,934
2004	368,758	547,348
2005	465,154	667,976

Table 50. Cocoa Export by Destination 2002 - 2005

Destination	2002		2003		2004		2005	
	Volume (Ton)	Value (000 US$)	Volume (Ton)	Value (000 US$)	Volume (Ton)	Value (000 US$)	Volume (Ton)	Value (000 US$)
USA	140,449	203,004	78,198	137,245	105,414	165.771	126,595	198,376
Malaysia	78,659	115,629	139,438	216,981	128,125	169,193	158,577	195,804
Singapore	39,909	60,403	37,521	64,307	34,204	48,384	31,963	43,272
Brazil	67,501	103,549	21,260	34,238	16,008	21,741	28,371	36,291
China	4,568	2,411	7,838	11,545	14,940	11,697	19,187	22,784
Others	128,153	216,038	73,482	159,618	70,067	130,562	100,461	171,400
Total	**459,239**	**223,917**	**357,737**	**623,934**	**368,758**	**547,348**	**465,154**	**667,993**

Chocolate is one of the world popular food, chocolate is made for from cocoa and favoured by million's people. Cocoa bean could be processed into various products such as cocoa butter, paste, powder and for non food such as cosmetics material. Concerning trend and demand of the world cocoa market, the Indonesian cocoa development has a good prospect for the future.

I. Oil Palm *(Elaeis guineensis)*

The oil palm is a West African native palm. It was first introduced to Asia through the Bogor Botanical Gardens in Indonesia in 1848. Due to its beauty, oil palm was planted as ornamental trees in the early days. In due course, it was discovered the palm grew and fruited better in many other parts of Indonesia. In 1911, the first oil palm plantation was established in Sungai Liput and Asahan Indonesia.

Centre of Production: North Sumatera, Riau, Jambi, South Sumatera, West Kalimantan

Table 51. Acreage Production Oil Palm, 2000-2004

Year	Volume (Ton)	Value (000 US$)
2000	4,158	7,001
2001	4,713	8,396
2002	5,067	9,622
2003	5,284	10,441
2004	5,448	11,807

Kinds of Products: Cooking Oil, Red Palam Oil, Margarine. Bakery shortening, Frying Shortening, Vanaspaty, Confectinary Fats, Bio Diesel.

Table 52. Export of Oil Palm 2000 - 2005

Year	Volume (Ton)	Value (000 US$)
2000	4,697	1,328
2001	5,487	1.227
2002	7,078	2.350
2003	7,054	2,721
2004	9,601	3,954
2005	11,492	4,362

Table 53. Export of palm Oil by Destination 2002 - 2005

Destination	2002		2003		2004		2005	
	Volume (Ton)	Value (000 US$)	Volume (Ton)	Value (000 US$)	Volume (Ton)	Value (000 US$)	Volume (Ton)	Value (000 US$)
India	1,816	603	2,336	886	2,848	1,142	2,638	198,376
Netherland	1,383	348	580	205	861	520	1,482	195,804
China	438	164	882	352	1,225	540	1,549	43,272
Malaysia	474	154	448	177	710	294	813	36,291
Singapore	383	129	346	157	406	157	471	22,784
Others	2,584	952	2,674	944	3,551	1,301	4,539	171,400
Total	**7,078**	**2,350**	**7,054**	**2,721**	**9,601**	**3,954**	**11,492**	**4,362**

J. Cinnamon (*Cinnamomum aromaticum*)

Cinnamon or Cassia (Cinnamomum aromaticum, synonym C. cassia), also called Chinese cinnamon, is an evergreen tree native to southern China and mainland Southeast Asia west to Myanmar. Like its close relative, Cinnamon (Cinnamomum zeylanicum, also known as "true cinnamon" or "Ceylon cinnamon"), it is used primarily for its aromatic bark, which is used as a spice.

Cassia is a close relative to the cinnamon (Cinnamomum zeylanicum, or "true cinnamon"), Saigon Cinnamon (Cinnamomum loureiroi, also known as "Vietnamese Cinnamon"), Camphor Laurel (Cinnamomum camphora), Malabathrum (Cinnamomum tamala) and Cinnamomum burmannii trees. As with these species, the dried bark of cassia is used as a spice. Cassia's flavour, however, is less delicate than that of true cinnamon; for this reason the less expensive cassia is sometimes called "bastard cinnamon".

Whole branches and small trees are harvested for cassia bark, unlike the small shoots used in the production of cinnamon; this gives cassia bark a much thicker and rougher texture than that of true cinnamon.

In some cases, cassia (Cinnamomum aromaticum) is labeled "Indonesian cinnamon" to distinguish it from Cinnamomum zeylanicum). Cassia is produced in both mainland and island Southeast Asia. Production of cassia in the highlands of the Indonesian island of Sumatra was increased to meet demand, and Indonesia remains one of the main exporters of cassia today. Saigon Cinnamon, only having become available again in the United States since the early 21st century, has an intense flavour and aroma and a higher percentage

of essential oils than Indonesian cassia. Tung Hing, a rarer form of cassia produced in China, is said to be sweeter and more peppery than Indonesian cassia.

Cassia bark (both powdered and whole, or "stick" form) is used as a flavouring agent, for candies, desserts, baked goods, and meat; it is specified in many curry recipes, where cinnamon is less suitable. Cassia is sometimes added to true cinnamon but is a much thicker, coarser product. Cassia is sold as pieces of bark (as pictured on the left) or as neat quills or sticks. Cassia sticks can be distinguished from true Cinnamon sticks in the following manner: Cinnamon sticks have many thin layers and can easily be made into powder using a coffee or spice grinder, whereas Cassia sticks are extremely hard, are usually made up of one thick layer and can break an electric spice or coffee grinder if one attempts to grind them without first breaking them into very small pieces.

Table 54. Acreage and Production of Cinnamon 2000 - 2005

Year	Acreage (Ha)	Production (Ton)
2000	128,075	45,237
2001	135,572	40,635
2002	138,205	45,373
2003	140,969	64,830
2004	134,561	79,953

Table 55. Export of Cinnamon 2000 - 2005

Year	Volume (Ton)	Value (000 US$)
2000	1,718	954
2001	3,380	1,724
2002	34,166	17,414
2003	29,361	16,474
2004	40,979	22,885
2005	37,192	20,333

Table 56. Cinnamon Export by Destination 2002 - 2005

Destination	2002		2003		2004		2005	
	Volume (Ton)	Value (000 US$)	Volume (Ton)	Value (000 US$)	Volume (Ton)	Value (000 US$)	Volume (Ton)	Value (000 US$)
USA	14,172	7,875	14,342	8,208	15,501	9,076	15,324	8,535
Netherlands	3,523	1,629	2,939	1,602	4,033	2,348	6,076	3,149
Brazil	5,130	2,137	1,276	602	7,727	3,509	1,682	805
Germany	962	523	1,020	617	1,390	886	1,476	889
Canada	1,017	522	785	364	1,110	523	1,183	634
Others	9,362	4,728	8,999	5,081	11,218	6,543	11,450	6,321
Total	**34,166**	**17,414**	**29,361**	**16,474**	**40,979**	**22,885**	**37,192**	**20,333**

K. Cashew Nut (*Anacardium occidentale*)

The Cashew (Anacardium occidentale) is a tree in the flowering plant family Anacardiaceae. The plant is native to northeastern Brazil, where it is called by its Portuguese name Caju (the fruit) or Cajueiro (the tree). It is now widely grown in tropical climates for its cashew "nuts" and cashew apples. Originally spread from Brazil by the Portuguese, the cashew tree is now cultivated in all regions with a sufficiently warm and humid climate included Indonesia.

Centre of Production: South East Sulawesi, West Nusa Tenggara, East Nusa Tenggara

The cashew apple is used for its juicy but acidic pulp, which can be eaten raw or used in the production of jam, chutney, or various beverages. Depending on local customs, its juice is also processed and distilled into liquor or consumed diluted and sugared as a refreshing drink.

Cashew nuts are a common ingredient in Asian cooking. They can also be ground into a spread called cashew butter similar to peanut butter. Cashews have a very high oil content, and they are used in some other nut butters to add extra oil. In an off-the-shelf package of cashews found in the United States, a 30-gram serving contained 180 calories (750 kilojoules), 70% of which was fat.

The liquid contained within the shell casing of the cashew, known as Cashew Nut Shell Liquid (CNSL), has a variety of industrial uses which were first developed in the 1930s. primary end products: solids that are pulverized and used as friction particle for brake CNSL is fractionated in a process similar to the distillation of petroleum, and has two linings, and an amber-colored liquid that is aminated to create phenalkamine curing agents and resin modifiers. Phenalkamines are primarily used in epoxy coatings for the marine and flooring markets, as they have intense hydrophobic properties and are capable of remaining chemically active at low temperatures.

In Indonesia , cashew cultivation at the beginning aimed to prevent soil erosion by reforestation program, it was not for economic reason. But now it is an important commodity that cultivated by farmers with significant contribution in farmers income every year.

Table 57. Acreage and Production of Cashew nut 2000 - 2004

Year	Acreage (Ha)	Production (Ton)
2000	561.310	69.927
2001	568.912	91.586
2002	578.924	110.232
2003	573.281	106.932
2004	559.633	130.768

Table 58. Export of Cashew nut 2000 - 2005

Year	Volume (Ton)	Value (000 US$)
2000	27,618	31,502
2001	41,313	28,929
2002	51,717	34,810
2003	60,429	43,533
2004	59,372	58,187
2005	69,414	68,973

Table 59. Cashew nut Export by Destination 2002 - 2005

Destination	2002		2003		2004		2005	
	Volume (Ton)	Value (000 US$)	Volume (Ton)	Value (000 US$)	Volume (Ton)	Value (000 US$)	Volume (Ton)	Value (000 US$)
India	31,615	20,293	37,479	23,458	41,459	37,116	51,522	42,937
Vietnam	15,651	10,141	20,186	13,662	15,335	13,399	14,117	12,138
USA	190	377	857	2,369	857	2,369	1,404	6,977
Canada	121	406	-	-	276	1,038	237	1,172
Australia	127	423	-	-	-	-	86	451
Others	4,013	3,130	1,907	4,044	1,445	4,265	2,0478	5,298
Total	**51,717**	**34,810**	**60,429**	**43,533**	**59,372**	**58,187**	**69,414**	**68,973**

L. Nutmeg (*Myristica fragrans*)

Myristica fragrans , the Common or fragrant Nutmeg is the most important species commercially. Native to the Banda Islands of Indonesia, this species is also grown in the Caribbean, especially in Grenada. Other species include Papuan Nutmeg M. argentea from New Guinea, and Bombay Nutmeg M. malabarica from India.

Centre of Production: Maluku islands

The pericarp (fruit/pod) in Indonesia is sliced finely, cooked and crystallized to make a fragrant candy called manisan pala ("nutmeg sweets").

The essential oil is obtained by the steam distillation of ground nutmeg and is used heavily in the perfumery and pharmaceutical industries. The oil is colorless or light yellow and smells and tastes of nutmeg. It contains numerous components of interest to the oleochemical industry, and is used as a natural food flavouring in baked goods, syrups (e.g. Coca Cola), beverages, sweets etc. It replaces ground nutmeg as it leaves no particles in the food. The essential oil is also used in the cosmetic and pharmaceutical industries for instance in tooth paste and as major ingredient in some cough syrups. In traditional medicine nutmeg and nutmeg oil were used for illnesses related to the nervous and digestive systems. Myristicin and elemicin are believed to be the chemical constituents responsible for the subtle hallucinogenic properties of nutmeg oil. Other known chemical ingredients of the oil are ⊠-pinene, sabinene, ⊠-terpinene and safrole.

Externally, the oil is used for rheumatic pain and, like clove oil, can be applied as an emergency treatment to dull toothache. Put 1-2 drops on a cotton swab, and apply to the gums around an aching tooth until dental treatment can be obtained. In France, it is given in drop doses in honey for digestive upsets and used for bad breath. Use 3-5 drops on a sugar lump or in a teaspoon of honey for nausea, gastroenteritis, chronic diarrhea, and indigestion.

Alternatively a massage oil can be created by diluting 10 drops in 10 ml almond oil. This can be used for muscular pains associated with rheumatism or overexertion. It can also be combined with thyme or rosemary essential oils. To prepare for childbirth, massaging the abdomen daily in the three weeks before the baby is due with a mixture of 5 drops nutmeg oil and no more than 5 drops sage oil in 25 ml almond oil has been suggested.

Table 60. Acreage and Production of Nutmeg 2000 - 2004

Year	Acreage (Ha)	Production (Ton)
2000	64,033	20,010
2001	59,429	21,616
2002	61,558	23,157
2003	68,343	22,236
2004	74,271	20,998

Table 61. Export of Nutmeg 2000 - 2005

Year	Volume (Ton)	Value (000 US$)
2000	10,457	49,238
2001	7,970	21,369
2002	10,117	30,255
2003	10,761	29,285
2004	10,970	29,134
2005	15,278	47,749

Table 62. Nutmeg Export by Destination 2002 - 2005

Destination	2002		2003		2004		2005	
	Volume (Ton)	Value (000 US$)	Volume (Ton)	Value (000 US$)	Volume (Ton)	Value (000 US$)	Volume (Ton)	Value (000 US$)
Singapore	-	-	2,601	8,041	2,254	7,811	2,792	11,033
Netherlands	2,377	8,064	1,083	3,723	2,613	8,925	2,337	7,477
Vietnam	486	478	2,114	3,753	1,629	2,671	3,637	6,688
Japan	305	1,810	462	2,563	663	3,398	3,589	510
Germany	313	1,126	352	1,152	407	1,306	2,692	608
Others	6,636	18,777	4,149	10,053	6,673	15,555	230.32	21,433
Total	**10,117**	**30,255**	**10,761**	**29,285**	**14,239**	**39,666**	**15,278**	**47,749**

IV. LIVESTOCK

A. Cattlle *(Bos* sp.*)*

Cattle diversities in Indonesia were formatted from native and imported genetic resources. The three types of cattle in Indonesia are the draft, beef or slaughter and milk types. The total population of beef cattle is about 11,4 millions and dairy cattle about 354 thousand heads. The origins of native cattle were Java, Sumatra (Pesisir) and Bali-Cattle. The Indian *Bos Indicus* was imported since early of the 20th century, was played important role in cattle improvement.

The pure Ongole that was brought to Sumba Island became the **sumba ongole.** Next the sumba ongole was brought to Java and other places to be crossed with Java native (*Bos Javanicus*) cattle formed the ongole-grade (PO) and also madura cattle.

Dairy Cattle

In Indonesia dairy farming has been developed for many years since 1890. During its early development, various breeds dairy cattle were introduced such as Ayrshire, Jersey, Milking Shorthorn and Fresh Holland. Breeds of dairy cattle with high adaptation capability, milk production rate prefer by farmers are Fresein Holstein originated from Holland. The average milk production of cattle in Indonesia is 3000 – 5000 liter per year.

The number of cooperatives in Indonesia in Indonesia was increased from 27 cooperative in 1979 to 231 cooperative in 2002. The number of dairy cattle ownership per cooperative/KUD was 5987 heads of dairy cattle in 1979 increased to 279.652 heads in 2002 under cooperatives management. Milk production was 12.61 ton fresh milk in 1979 increased significantly to 451.33 ton fresh milk in 2002.

Dairy cattle population and milk production

East Java has the highest population of dairy cattle, followed by Central Java and West Java.

Bali Cattle (Sapi Bali)

Bali Cattle is Indonesia original native cattle, exist from domestication of wild banteng (Bibos Banteng). Domestication process took place in Bali island which

originality reserved until present time. As a source of germ plasma, Bali cattle conservation is carried out by increasing their population and genetic merit. Bali cattle is medium in size and used as draft cattle. Bali cattle is suitable for hot and humid area. Beside in Indonesia, Bali cattle also found in Malaysia, Philippine, Hawaii and North Australia.

Madura (Bali-Ongole-Java Native Composite Breed)

Madura (bali-ongole-java native composite breed) is a composite breed develop in Bali (*bibos banteng*), Java native (*Bos Javanicus*), and *ongole bos Indicus* cattle. The uniformity of the new specific breed used for draft, slaughter, race and show by tuft selection by the society of the Madurese people.

B. Buffalo *(Bubalus bubalus)*

Buffaloes are known since long ago in Indonesia, comes from the water and river Asian countries and domestic buffaloes and domestic buffaloes. The population of buffalo in Indonesia is around 2.4 million heads.

Swamp buffalo

People in many parts of Indonesia put buffalo as valuable and appreciable animal, which will make the owner very proud because other people place the owner in a higher status in the society.

Murrah water buffalo

Murrah water buffalo is found in limited numbers in North Sumatera, Java and Sumbawa, were brought from India long ago to get more milk.

Spotted buffalo

Spotted buffalo is found only in Toraja district of South Sulawesi Province. The buffalo is used more ritual purpose.

Kalang buffalo

Kalang buffalo is found only in Kalimantan, especially in the South and Central Kalimantan where the area are swampy area. The buffalo is used as slaughter animal and cultural purposes.

C. Chicken *(Gallus* sp.*)*

In Indonesia, the native chicken derives from the jungle fowl in India, Nepal, Pakistan, Bangladesh, and South East Asia. The species comprises of:
1) *Gallus-gallus,* 2) *Gallus soneratii,* 3) *Gallus lafayeti,* 4) *Gallus varius.*

The Specific Native Chicken

Kedu

Kedu is founded in Kedu; the most are in Temanggung, Central Java. Although the characteristic of the chicken mention no species in color, but the black feather, shanks, beak and skin are much dominant than otherwise yellowish color. The chickens have single and pea-blackish combs. The eggs production is around 100 to 200 eggs per annum. Two types of Kedu compress of layer and fighter are available.

Cemani

Cemani is quiet and unique chicken in Central and East Java, and also in Madura. There are usually used in traditional and ritual ceremonies. The skin, feather, claws, tongue and meat are black of blackish, even the blood is blackish red.

Nunukan

Nunukan is found in Tarakan and Nunukan East Kalimantan and could be originality Plymouth Rock brought by the Chinese people from Tawao. They are now used as dual purpose egg and meat chicken. the characteristic of memion a bright or hellish red color.

Pelung

Pelung, the characteristic are large body, a large and bright red comb with non specific color and long and melodious crow. The cocks have been selected for good crow by the people in Cianjur, West Java for long time ago.

D. Goats *(Capra sp)*

Goat are bred widely to be used for slaughtering, saving, traditional and ritual ceremonies and also for milk purpose. The Kacang is Indonesian native small goat. Ettawah were imported from India. Saanen came from Australia in 1978. How the Costa goat was brought into the country in Banten is not known. Angora or Montgomery goat was imported for the experimental stations in Bogor, Bandung and Padang and Mangatas.

Hollandshce edelge it was brought to Java and Sumba. The population of goats in Indonesia is more than 13 millions, more than 60 percent are in Java.

Kacang goat is type of quick yielding animal, the mature male's body is quire small and short compared to the Indian or European breeds.

Ettawah and Crossbred characteristic of Ettawah are big, the weight reaching 90 kgs males and 60 kgs for the females with a specific chubby nose, long

ears, furs and large mammae and milk. Many of Ettawah crossbred are adapt well in the country. They are found in many areas of Java and also on Madura island, Sumbawa island, and Sumatera island in Padang Mangatas.

The gembrong goats are found in Bali. The population is less than 100 heads are situated in a critical condition. The distribution of the goats are in the eastern part of Bali Island, especially in the villages of Bug-bug, Seraya, Culik, Kubu in district of Karang Asem.

Boer goats, numbering less than 500 heads are distributed in North Sumatra and South Sulawesi, was imported from Australia recently, in order to grade up the local breed since year 1997.

E. Horse *(Equus cabalus)*

The use of horse are for riding in hilly or mountain regions, for drawing the carriage (sado, delman, andong) for sports or hunting, for racing, and even slaughtered and eaten by some people in Jeneponto South Sulawesi, in North and South, North Sumatra and Central Java, West and East Nusa Tenggara. in the growth population in 2002 the population amounted 446 thousands.

F. Pig *(Sus* sp.*)*

Indonesian pig farms started to develop to be an industry through intensive farming. Pig farm are generally operated by small scale businesses and some are located in Java Island. Consumers are becoming aware to the quality of pork, such as fat content, cutting method of fresh and processed meat.

Breeds of pig available in Indonesia are still dominated by Large White, Landrace and Durock, other breeds are Yorkshire, Saddleback, Polland China, Spotted Polland China, Tamworth and Hereford. Local breeds consist of Tapanuli, Papua, Bali, Kerawang, Sumba, Babirusa from Sulawesi and Nias pig.

Production centers of pig industry are located in Solo (Central Java), Bali, West Kalimantan, North Sumatera and Bulan Island (Riau).

G. Sheep *(Ovis* sp.*)*

There are native and imported sheep for slaughtering, carpet making, fertilizing the plantations, but also for fighting purposes in some places in Indonesia. The sheep husbandry based activities development in West Java has gained attention since the Era of Dutch colonialism, with the main purpose of meeting the demand for meat for Dutch people. One of developing was by importing sub-tropical race wool type (Merino, Ramboullet, and Romney) and boiler type (Corride, Soffolk). It was predicted that the cross breeding of the sub-tropical race with local sheep of Priangan has brought for what is now popularly known as Garut sheep.

Table 63. Meat Production in Indonesia, 2000–2005 (000 Ton)

Commodities	Year					
	2000	2001	2002	2003	2004	2005
Beef cattle	339,94	338,69	330,29	369,71	447,57	358.70
Buffalo	45,85	43,65	42,30	40,64	40,24	38.05
Goats	44,89	48,70	58,17	63,86	57,13	50.60
Sheep	33,41	44,77	68,71	80,64	66,06	47.33
Horse	1,00	1,09	1,06	1,60	1,57	1.59
Chicken						
Pork	162,40	160,15	164,49	177,09	194,68	173.87

Source : 1. Central Bureau of Statistic, Indonesia 2. Ministry of Agriculture, Indonesia

Table 64. Import Value of Livestock 2000-2004 (US$)

Commodities	Year					
	2000	2001	2002	2003	2004	2005
Horse	1,123,958	891,149	113,508	1,311,798	82,013	20,217
Cattle	154,209,741	101,300,197	79,252,204	121,537,930	132,031,007	150,605,173
Pig	1,430,609	887,384	1,667,221	1,790,762	1,342,320	676,158
Goat	5,192	16,190	25,892	426,819	8,568	2,698,739
Chicken	19,275,436	11,861,502	11,379,369	11,092,778	9,284,103	11,663,18
Dairy	189,173,318	247,878,128	173,906,402	207,475,321	329,382,793	399,165,422
Yoghurt	112,406	209,503	183,223	250,862	244,769	239,988
Butter	17,077,529	12,252,479	15,462,263	16,553,517	26,284,087	89,198,281
Cheese	11,503,968	14,379,406	15,623,425	14,517,137	27,592,574	28,263,702
Egg	4,128,588	153,572	2,807,921	1,923,777	2,305,952	2,211,758

Source : 1. Central Bureau of Statistic, Indonesia 2. Ministry of Agriculture, Indonesia

Table 65. Export Volume of Livestock 2000-2005 (kg)

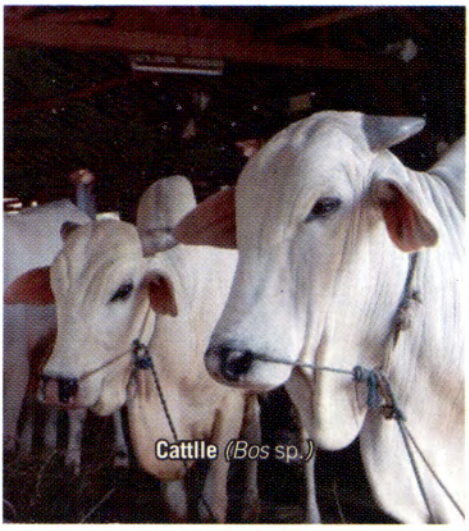
Commodities	Year					
	2000	2001	2002	2003	2004	2005
Horse	23,510	-	5,455	67,264	39,756	4,010
Dairy cattle	46,749	229,157	264,275	178,961	41,859	166,284
Pig	27,742,901	28,348,237	29,031,924	28,151,923	22,895,261	22,464,419
Goat	12,628	40,892	4,928	17,470	105,683	224,076
Chicken	919,890	1,795,308	2,463,877	2,853,934	103,047	502
Dairy	31,482,393	29,743,687	27,252,285	46,027,215	36,725,222	45,018,446
Yoghurt	68,116	115,464	370,417	924,556	704,763	336,982
Whey	1,381	48,402	15,458	308,963	65,708	-
Butter	61,702	94,729	162,785	76,640	42,286	204,691,934
Cheese	21,745	28,350	33,758	235,002	251,024	291,276
Egg	221,752	834,118	1,038,278	857,965	270,990	837,190

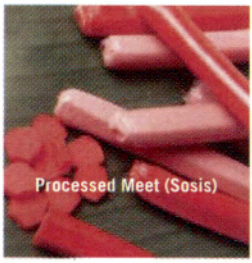
Source : 1. Central Bureau of Statistic, Indonesia 2. Ministry of Agriculture, Indonesia

Livestock Products


Beef


Processed Meet (Bakso)


Cattlle *(Bos sp.)*


Processed Meet (Sosis)


Milk


Chicken *(Gallus sp.)*


Egg


Satai

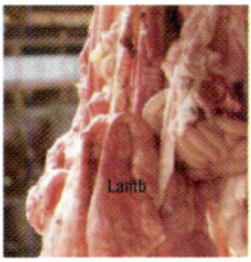

Layer Chicken


Shutlecock


Native Chicken


Native Chicken

Livestock Products


Lamb


Skin Processed (Chips)

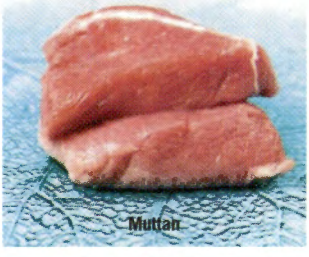

Goats (*Capra* sp.)


Organic Fertilizer


Satai


Hides


Sheep (*Ovis* sp.)


Muttan


Horse (*Equus cabalus*)


Pig (*Sus* sp.)

Table 66. Export Value of Livestock 2000-2005 (US$)

Commodities	Year					
	2000	2001	2002	2003	2004	2005
Horse	78,211	-	12,709	300,588	107,701	4,856
Dairy cattle	101,733	251,876	598,406	547,683	163,623	433,862
Pig	33,874,556	37,246,684	30,294,832	25,115,260	21,826,578	25,935,558
Goat	7,099	9,500	8,266	17,106	105,222	340,067
Chicken	3,424,146	4,660,183	6,409,812	6,116,595	166,290	78,144
Dairy	55,080,323	64,410,687	50,527,355	53,172,102	59,664,476	90,150,666
Yoghurt	75,115	87,660	312,815	1,294,523	878,943	743,494
Butter	109,989	70,343	147,361	69,411	63,866	98,490 767
Cheese	57,575	76,655	74,749	1,354,240	1,164,927	958,508
Egg	264,414	22,574,276	773,850	1,273,754	323,897	93,177

Source : 1. Central Bureau of Statistic, Indonesia 2. Ministry of Agriculture, Indonesia

Table 67. Import Volume of Livestock 2000-2004 (kg)

Commodities	Year					
	2000	2001	2002	2003	2004	2005
Horse	1,209,807	651,345	67,501	1,393,159	19,045	5,581
Dairy cattle	151,180,534	102,529,134	81,333,612	121,537,930	132,031,007	109,629,671
Pig	1,910,556	1,565,783	1,913,019	2,200,232	2,683,888	360,219
Goat	5,854	14,779	15,584	1,273,517	1,794	829,658
Chicken	14,399,795	1,551,987	440,075	311,767	1,230,439	3,861,340
Dairy	117,268,226	119,925,131	107,867,713	117,318,145	165,411,493	173,084,444
Yoghurt	80,856	234,537	106,289	134,706	172,027	169,396
Butter	11,621,327	8,108,645	12,106,153	11,811,132	15,105,988	89,198,281
Cheese	6,002,215	6,419,878	7,514,892	7,197,998	11,302,848	9,882,705
Egg	1,747,516	902,112	1,165,200	1,519,739	895,038	726,528

Source : 1. Central Bureau of Statistic, Indonesia 2. Ministry of Agriculture, Indonesia

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