

Pepper, 'King of Spices'

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Pepper, widely regarded as the 'King of Spices', is the world's most widely used spice for food flavouring. It is the fruit of the tropical climbing vine *Piper nigrum* L. (Family: Piperaceae). Black pepper is obtained when mature green or yellow berries of the pepper vine are harvested and dried. If the fruits are retted and the skin (pericarp) along with the underlying pulp is removed before drying, white pepper is obtained. About 95 % of the pepper traded globally is in the form of black and white peppercorns. The remaining 5% is made up of pepper oleoresin, pepper oil, green pepper and ground pepper.

Both black and white pepper have a characteristic pungency and distinct aroma that makes these products essential ingredients in food from all parts of the world.

Historical Background

Pepper originates from the dense evergreen forests of the Western Ghats of south-western India. From there, it has spread to many parts of Asia, notably Sri Lanka, Indonesia, Malaysia, Thailand, Cambodia, Vietnam and South China. The earliest record of cultivation in Sarawak was in 1856 when St. John Spencer had noticed remnants of deserted pepper gardens far up the Limbang River. In 1873, the first attempt to plant pepper was made by a party of Chinese from Singapore at Matang area. More systematic planting was carried out about two years later in 1875. By 1895, planting had spread over a wide area as a result of land incentives under Charles Brooke's administration and the import of foreign labour. After World War II, rapid recovery of the world economy led to a surge of demand for pepper, increased prices and hence increased acreage in Sarawak. At the end of 1952, there was a serious outbreak of *Phytophthora* foot rot disease which threatened to destroy the industry. The depressed prices in the 50's caused a marked reduction in pepper production until 1959 when rising prices led to extensive new plantings. For pepper cultivation during the early period, burnt earth was widely used and rotenone from the tuba plant (*Derris elliptica*) was sprayed to control insect pests.

Between 1959 and 1980, the pepper industry had achieved a great deal in terms of technology development, governmental assistance on production and regulated marketing practices. During this period pepper production had expanded though the extent of production was largely determined by price fluctuations, pepper being an export-oriented crop.

Current Status of the Industry in Sarawak

Today, pepper is one of the important cash crops supporting the livelihood of about 67,000 rural dwellers in upland areas of Sarawak. Holdings are small, averaging 0.2 ha. They concentrate in certain Districts of Kuching, Samarahan, Sri Aman, Betong, Sibul, Kapit and Sarikei Divisions. The present estimated area is about 12,000 ha.

Sarawak exported about 16,708 tonnes of pepper in 2006 and 14,971 tonnes in 2007, valued at RM 136 million and RM 177 million respectively. Nearly 98% of Malaysian pepper is produced in Sarawak. Currently, Malaysia ranks No. 6 after Vietnam, India,

Brazil, Indonesia and China in terms of pepper production. Malaysia's production in 2007 was about 20,000 tonnes.

The Pepper Plant

Pepper vines thrive in warm and wet tropical climate. They are normally grown from stem cuttings, rarely from seeds. The root system is developed from adventitious roots formed at nodes that are buried in the soil at planting. As the vegetative (*orthotropic*) shoot climbs upward, a simple leaf is produced at each node. A bunch of short adventitious roots also develops to help the shoot cling to the support. At each node an axillary bud grows into a lateral branch (*plagiotropic*) which eventually bears the fruit spikes.

Flower spikes originate at the node opposite each leaf. Most cultivars have bisexual flowers that are usually self-pollinated. The fruit is a berry, pale green and soft in the early stage, but turns dark green and hard as it matures. The outer skin (*exocarp*) becomes yellow and bright red and becomes soft as it ripens. Each berry contains a single seed enclosed by a pulpy mesocarp. The commercial black peppercorn is the entire dried berry whereas the white peppercorn is the seed.

Peppercorn owes its pungency to the presence of the alkaloids piperine, chavicine and piperettine. Volatile essential oils give rise to the typical aroma. Together, these compounds constitute the oleoresin. The spiciness and pungency are influenced by varieties and also the growing locale.

Crop Research Corner

This corner carries a fortnightly series of articles mainly on crop research contributed by research officers based at the Agriculture Research Centre (ARC) Semongok, located at Km 21, Jalan Puncak Borneo, near Kuching. The focus of the articles is on crop research and technology carried out and their contribution to agriculture in Sarawak. The above is the first of a series of articles on pepper. The article was contributed by Senior Research Officer Encik Paulus Amin Det (e-mail: Paulusad@sarawaknet.gov.my)



Four-year old pepper vines.



Harvesting using wooden ladder.



Freshly-harvested green pepper spikes



Drying black pepper



Drying white pepper



White pepper products



A well-maintained pepper farm in Sarikei Division.