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Status report:

Root Crop Production, Utilization and Marketing in Malaysia

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MALAYSIA

Introduction

- Root crops- minor cash crops
- Main root crops in Malaysia- Cassava, sweetpotato and cocoyam
- Total area planted with cash crops- 13,000 ha
- Out of these, only 37.8% were planted with tuber crops

Area planted (ha) with tuber crops in Malaysia 2001

	Cassava	Sweet potato	Coco yam	Total
Peninsular Malaysia	1,722.2	1,288.4	628.6	3,639.2
East Malaysia	1,029.9	125.3	118.6	1,273.8
Total	2,752.1	1,413.7	747.2	4,913.0

Production statistics on cassava and SPotato in Peninsular Malaysia 2006

Crop	Area (ha)	Prod. (t)	Av. yield (t/ha)
Cassava	2,427	31,546	13.0
SPotato	1,899	28,478	15.0

Cassava Production

- Cassava was an industrial root crop grown in the past up to a peak of 22,000 ha in 1976.
- During this era, Malaysia was a net exporter of starch → to Europe, Canada, USA and Japan
- Recently, the role of cassava as a starch source has become smaller mainly because of the lower price (~US$0.05/kg)
- Whereas Edible Cassava roots fetch high price (US$0.10-0.14/kg.
- Less interest by farmers to grow cassava for starch factories
- In 1980's Malaysia becoming net importer of starch

Cassava Production.....

- Currently, the main production areas are in the states of Johor, Selangor and Perak located on mineral soils and drained peatland.
- MARDI has complete production technology packages for these two main groups of soils

Cassava Production.....problems.

- Even though there is good demand for starch - Suitable land is not available. A small starch factory → around 1,500-2,000 ha
  - The operation requires mechanization to some extent to overcome labor constraints for field operations such as planting and harvesting.
  - The use of field machines rules out peat and hilly areas
  - *Bris* and tin-tailings (sandy soils) can be planted with cassava, but need higher fertilizer inputs.
  - Sandy soils in wind-prone areas can give rise to large crop losses through lodging because of poorer anchorage of the roots in sand.

Sweet Potato Production

- Sweetpotato has always been a minor cash crop
- Major growing areas:
  - on tin-tailings (in rotation with yam-bean in Perak)
  - drained peat (in Selangor and Johor),
  - *bris* sandy soil (as an off-season crop in tobacco farms in Kelantan) and
  - on paddy land (as in the off-season in single-crop areas in Kedah).
- Sweetpotato has an advantage over cassava → less competition from more lucrative crops.
- The coming implementation date for AFTA in 2010 → need to find alternative for tobacco. One such crop is sweetpotato
- The NTB currently actively promoting sweetpotato to some established food processors

Cassava Utilisation

- Domestic demand for cassava starch good – main uses
  - Monosodium glutamate or msg, a flavor enhancer.
  - Recently, demand for cassava dried up – faced difficulties in securing constant supply of starch locally
  - The company decided to use glutamic acid instead of starch as raw materials.
  - Other major uses :glucose, paper products, the yeast, small foods (rice *vermicelli*, noodles, sauces, ice cream, biscuits and snack foods), textile and laundry industries. Glucose in turn is used in beverages and confectionery.

Cassava utilisation.....

- Edible cassava:
  - For fresh consumption (boiled or fried)
  - Processing into traditional snack food such as *kerepek* (oil-fried crisps), *keropok* (crackers) and *opak*.
  - Modern snacks such as chips (similar to those potato chips in canisters), extruded snacks, and even fries.
- Lately – interest in growing cassava to make biofuel as well as biodegradable plastic. Starch varieties will be suitable but the issue - availability of large tracts of suitable land.

Technologies available at MARDI

- Suitable varieties for starch and edible cassava
- Production Technology (agronomic and cultural practices)
- Machine systems for mechanization on mineral soils
- Processing technologies for traditional and snacks food products

Sweet Potato Utilisation

- Sweetpotato is sold for fresh use with no major processing industry
- Except for small-scale production of traditional snacks or as a filler in Chinese pastries, such as moon-cakes during the Mid-Autumn festival.
- This dependence on the fresh market limits the production of sweetpotato, leading to drastic drops in price when production is expanded suddenly.

Sweetpotato utilisation.....

- Sweetpotato can be a very nutritious raw material for processed food and beverage products,
  - Orange-fleshed varieties are rich in ß-carotene
  - Purple-fleshed ones are rich in anthocyanin
  - Rich in vitamins C and E, potassium and dietary fiber

Production Tehnologies

- Processing technologies for a range of food products
- Varieties suitable for processing
- Crop Production technologies
  - sandy soils (*bris* and tin-tailings), mineral soils, acid sulphate soils and drained peat.
  - The technology includes fertilization, cropping system and mechanization.

Products Developed by MARDI

Product category	Types
Bakery products	Cakes, muffins, biscuits, bread, sweet buns
Traditional cakes	Premix flours for nine types (*bingka*, *seri muka*, *keria*, *lopes*, *kuih kacau*, *kuih lapis*, *cek mek molek*, *onde-onde* and pudding)
Snacks	Crispy sweetpotato chips, hard candy, sweetpotato rounds, vacuum-fried crisps (*kerepek*), extruded snacks

Products - MARDI..*cont.*

Product category	Types
Breakfast food	Extruded products
Sauces	Sweetpotato sauce, sweetpotato-chili sauce
Sweet filling	For buns
Fried products	French fries,doughnut, breaded sweetpotato, nugget
Beverages	Straight juice, milky drink
Pasta	Wet noodles

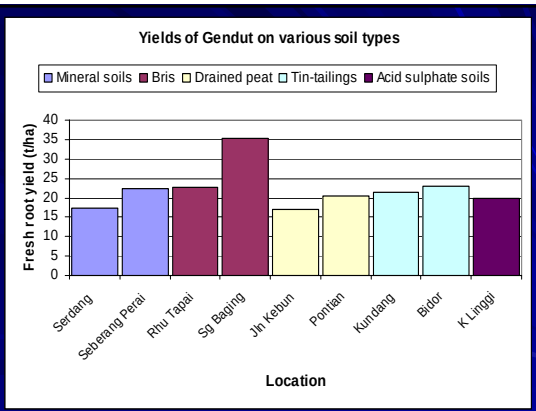
Product developed.....MARDI

- Incorporating Sweetpotato as raw material to the above products will help to offset the high food import bill to substitute wheat flour (annual import around US$220 million) as well as Irish potato (annual imports of US$16.5 million) as fries and other snacks.


TELONG


JALOMAS


GENDUT


Yields of Gendut on various soil types
Mineral soils
Bris
Drained peat
Tin-tailings
Acid sulphate soils
Fresh root yield (t/ha)
40
35
30
25
20
15
10
5
0
Serdang
Seberang Perai
Rhu Tapai
Sg Baging
Jln Kebun
Pontian
Kundang
Bidor
K Linggi
Location

Cassava Marketing

- Cassava used to be planted almost exclusively for the starch extraction industry.
- This situation has completely reversed. Out of 20 starch factories that existed – only 2 remain in operation.
  - Cheap cassava starch imports from neighbouring Thailand
  - The price differential between roots for starch and roots for food.
  - Roots for starch ~ farm gate US$0.05/kg
  - Edible roots ~higher price → US$0.10-0.14/kg.
  - Most of small farmers prefer to plant edible cassava

Cassava marketing

- Currently- about 17% of the 2,400 ha planted by a single plantation in Peninsular Malaysia is growing cassava to make snacks (mainly crisps or chips) for both domestic and export cassava
- Most edible cassava goes towards cottage industries
  - processing oil-fried crisps in various flavors
  - *For making tapai*, a fermented dessert product.

Sweet Potato Marketing

- Sweetpotato as yet has no major industry to absorb supply → price very unstable
- Sweetpotato prices
  - US$.010 to US$0.27 per kg roots at the farm gate
  - Depending on the variety – orange/purple flesh higher price
  - Time of the year - higher prices are encountered yearly during fasting month
- The middlemen are responsible for transporting the roots to the wholesale markets in the cities.
  - There is no proper grading system → it is based only root size
  - FAMA - "fair and acceptable quality"
- Farmers sell their produce directly in weekly farmer markets known as *pasar tani* (managed by FAMA), thus bypassing the middleman.

Sweet Potato Marketing

- Retail prices
  - Local varieties → US$0.55-0.82/kg.
  - Imported varieties → US$1.35 to US$1.80 per kilogram sold in supermarkets and wet markets
- As long as there is no significant downstream industry based on sweetpotato, there is not much room for expansion in sweetpotato area.
- MARDI is trying hard to interest food processing companies to use sweetpotato as a raw ingredient for the range of products mentioned earlier.
- A company which is currently exporting frozen cassava roots and processed cassava products has shown active interest in including sweetpotato in their product line.
  - They are prepared to pay US$0.11 for one kilogram of fresh sweetpotato to farmers who wish be contracted by the company.

Conclusion

- The future of root crops in Malaysia – in particular cassava and sweetpotato – appears to be linked to the parallel development of downstream processing into food products.
- Starch production seems somewhat unpromising given the low prices offered by starch factories as well as the ready availability of starch imports from Thailand.
- When root crops are used as raw materials for processing food products, a farmer can expect better prices for his cassava or sweetpotato.
- Processing can be directly from the fresh roots (small-scale or cottage industries), or go by way of an intermediate storable product, i.e. flour for the larger scale commercial plants).

Conclusion

- Sweetpotato has several advantages over cassava
  - it is adapted to a range of marginal soils.
  - it can withstand strong winds (whereas cassava will lodge)
  - it has a much shorter cropping cycle (3½-4 months)
  - it can be more nutritious
- Cassava, on the other hand
  - less susceptible to serious pest and disease
- MARDI does not give research attention to cocoyam
  - The crop has several desirable characteristics that should be mentioned
  - The digestibility of cocoyam starch is about 98.8 %
  - It can be used by foods for infants → it is indeed widely used in infant formula in the USA, and it has become an important constituent of proprietary canned baby foods.
  - Like sweetpotato, cocoyam can also be processed into many forms of snack foods.

Thank You

for your attention