



LEMBAGA GETAH MALAYSIA

Kreatif • Inovatif • Progresif

STINGLESS BEES IN THE RUBBER PLANTATION ENVIRONMENT

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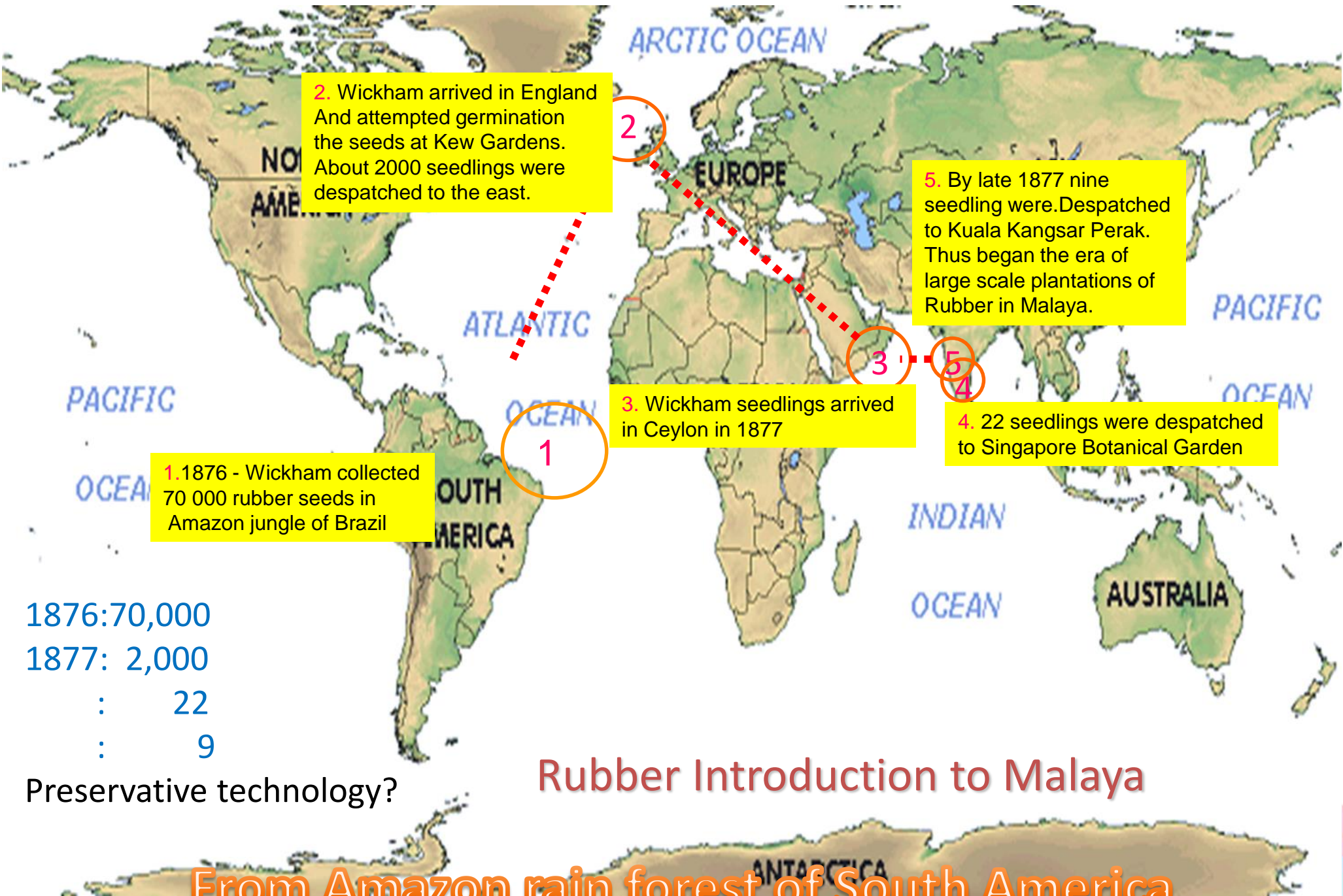
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***Rubber Research Institute Malaysia
(RRIM), Malaysian Rubber Board
(MRB)***

Outline

- History of rubber
- Planting Rubber and Rearing Stingless Bees
- Stingless Bees as pollinators
- Conclusion

BEGINNING OF RUBBER INDUSTRY IN MALAYSIA



1876: 70,000
1877: 2,000
: 22
: 9

Preservative technology?

Rubber Introduction to Malaya

From Amazon rain forest of South America



Rubber Species

- Hevea benthamiana
- **Hevea Brasiliensis**
- Hevea Comprorum
- Hevea guianensis
- Hevea microphylla
- Hevea nitida
- Hevea pauciflora
- Hevea rigidifolia
- Hevea spruciana

Conditions of Growing Rubber tree

- Located 1000 km north & south of the equator
- 180 – 250 cm of rainfall per year
- Temperature 25 – 35 °C
- Maximum elevation of 500m above sea level
- Has a deep firm soil of loamy texture and good drainage
- A water table of about 100cm

Major Rubber Producing Countries



Economic Life of Rubber Tree

- Immature period 5 years
- Open tapping after 45cm inches @tree growth at 150 cm height from the ground
- 25 years for countries plantation
- 15 years for rubber forest



- World Rubber Industry boom after invention of pneumatic tyre
- The Rubber plantation increase all over the world
- 70 % of rubber consumption goes to the tyre industry

Rubber Plantation

- 500 trees per ha
- Commercial planting distance 5 m X 4 m
- H- Planting 10 m X 2m



Rubber Produced

- Cuplums
- Latex
- Productivity measurements :-
 - Gtt (free productivity)
 - Kg/tapper
 - Kg/ha/yr

HEDGE Planting



- Also to integrate rubber with fruit trees
- Wider inter row, 10Meters apart
- Increase economic activity in the area

Integrated activities & Income

- Help to increase income of smallholders by optimising land use
 - Fruit trees (rambutan, jackfruit)
 - Livestock rearing
 - Bee keeping

Stingless Bees in Malaysia

- Diversity in Peninsular Malaysia was last studied in 1990.
- MRB, the study on stingless bees integrated with rubber started in Sept. 2015
- Started with 10 cages
- Success rate only 50%

Stingless Bees Species

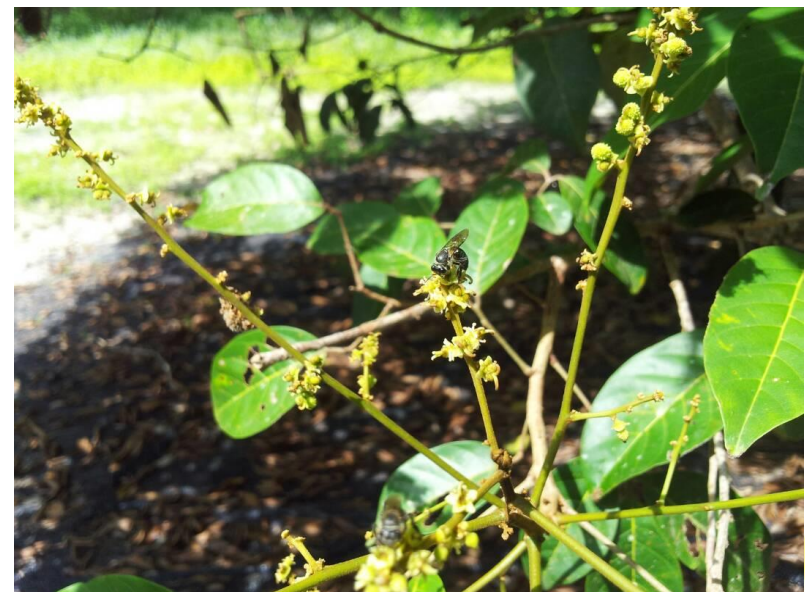
Approximately 33 stingless bee species

- Two most common are
 - *Trigona Itama*
 - *Trigona thoracica*

Rearing Stingless Bees Rubber Plantation

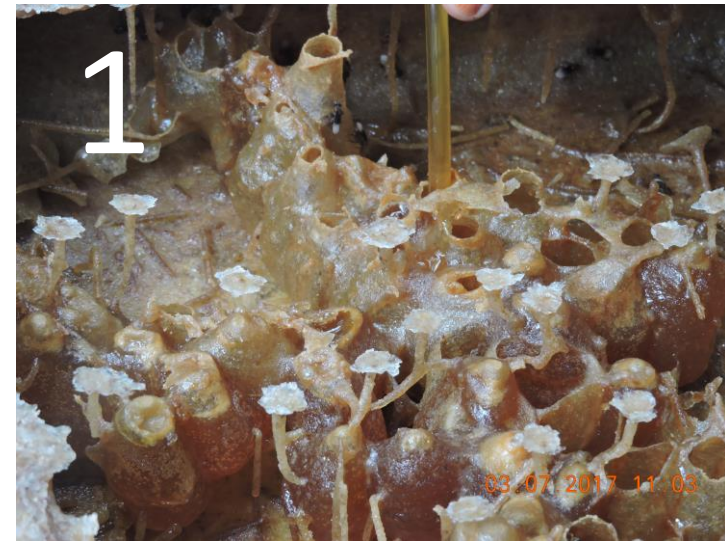


H-Planting
integrated rubber
with Rambutan



Training of Smallholders

- MRB trained smallholders on rearing of stingless bees
- Starting with 40 nests
- Only sixty percent of the nest produced honey
- Help to increase income.
- Further study is required to increase success rate
- Different environment for different species



NOTE:

1. Honey
2. Honey for different species
3. Opening cages for harvesting
4. Process of harvesting honey
5. Pump used



Benefits

- Two rubber flowering seasons per year
Julai – Ogos and Jan – Feb
- Stingless bees as the pollinators
- 100 to 300 meters to their nests
- Increase seeds production and income of growers

Income for the Smallholders (2.2ha)

- From Rubber - RM1300 permonth (1450 kg/ha/yr @RM 5.00 per kg
- From Stingless bees - 40 nests (only 60% of the nests produced honey).
- Income from stingless bee RM1955.00/month

Potential income : RM 3255.00/month



Importance of Stingless bees in Seeds Production

- Required 60 million of rubber seeds per year.
- 300 tons @200,000 seeds/tons.
- Ratio 1:3 (1 young budding /polybaggedbudded stump:rubber seeds)
- Fresh rubber seed is required in order to increase germination rate.
- Rubber seeds are sold USD at 1/ kg.
- USD 300,000/rubber seeds.

Activity of Stingless Bees on rubber flowers



Study on seedfall at RRIMINIS Tok Dor, Terengganu

- Area planted H-Planting
- Clone: RRIM 2000 series
- Produced 250 kg seeds/ha.
- Number of stingless bees nest: 10
- Stingless bees species:
 - 2 nest *Trigona thoracica*
 - 8 nest *Trigona itama*

Seeds Germination Rack



Stingless bees as indicator of biodiversity

- As pollinator for the Hevea flowers
- Also feed on weeds, bushes, under growth and perennial crops flowers with it coverage

Good Agriculture practice (GAP)

- Extra care required when applying pesticides
- No blanket application of herbicides
- Manual or mechanical slashing should be encouraged
- Biological control of weeds

Biological control of weeds



Specific objectives of the study of stingless bees on seeds production

- To identify the duration of seedfall season with stingless bees
- To determine the amount of weight of Hevea seeds that one unit area can produce with vs without stingless bees
- To determine the germination and mortality percentage of Hevea seeds
- To determine the best agronomic practices to be employed with stingless bee

Expected output the study

- Recommendation of stingless bees with respect to Hevea seed production
- Effective GAP methods without endangering bee population
- Effective and practical rubber seed collection technique
- Provide guidelines to the industry in seed collection and storage when integrating with stingless bee.

Conclusion

- Stingless Bees increase income of smallholders (especially during flowering season May to July)
- Stingless Bees may help in increasing production of Rubber seeds.

A close-up photograph of a honeycomb structure, showing the hexagonal cells and the bees working on it. The honeycomb is a light yellow color, and the bees are small, dark insects. The background is blurred, focusing attention on the honeycomb and the bees.

ENJOY YOUR STINGLESS BEE HONEY

THANK YOU