

Integrated Pest Management in Malaysia

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Outside vs. inside: 17 vs. 45 kg m⁻² y⁻¹



IPM has already started: a greenhouse protects a crop against adverse conditions, including pests

Chemical control of pests and diseases



spray stick



spray bar

'Stop excessive use of pesticides'

Ensure continuous demand for produce, Cameron farmers told

CAMERON HIGHLANDS: Farmers here are advised not to go overboard when using pesticides to ensure their produce continues to be in demand.

"Excessive use of pesticides will affect the good name of Cameron Highlands as a major vegetable producer.

"It will also affect the confidence of importers," said Deputy Agriculture and Agro-based Industry Minister Chua Tee Yong.

He also advised the farmers to protect their health.

"There have been reports that some farmers have died due to the excessive use of pesticides," he told reporters after opening the national-level Good Agricultural Practice Campaign here yesterday.

He was commenting on the opening speech by agriculture director-general Datuk Roseley Khalid earlier, who said a campaign had been launched to edu-

cate farmers on the use of pesticides.

Roseley said the campaign was launched in Cameron Highlands because there had been many reports that farmers here were not prudent when using pesticides for their crops.

Chua also called on state governments to communicate regularly with farmers, to give them confidence and security to invest in upgrading their farms.

"One of the reasons why farmers use a lot of pesticides for their crops is because the land lease on their temporary occupation licence is short.

"So they use pesticides to increase their production and maximise their output within the given lease time," he said.

In his speech earlier, Chua said he was confident the campaign would create awareness to farmers about the importance of good agricultural practices.

Why IPM?

- Pesticide use must go down
 - Market
 - Pesticides are expensive
 - Local consumers and export demand low residue levels (certification)
 - Yield reduction due to phytotoxicity
 - Shortening longevity of plastic cover
 - Control
 - Resistance development to pesticides
 - Control of secondary pests, lacking selective chemicals
 - Workers' health
- Alternative control strategies needed
= IPM

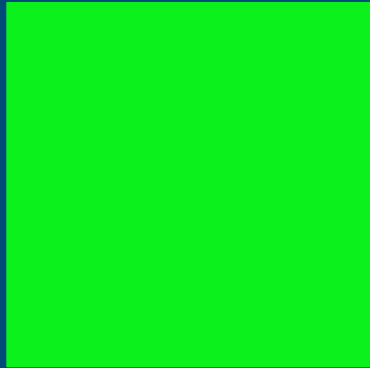


What is IPM?

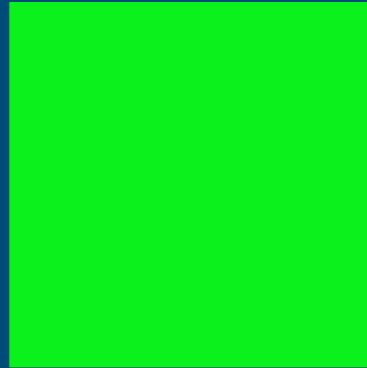
- Success depends on understanding of crop, pests and control
- Growing a healthy crop
- Combination of control strategies
- **Last step is pesticide use**
- High science, low technology
- Change in attitude
- Learning process



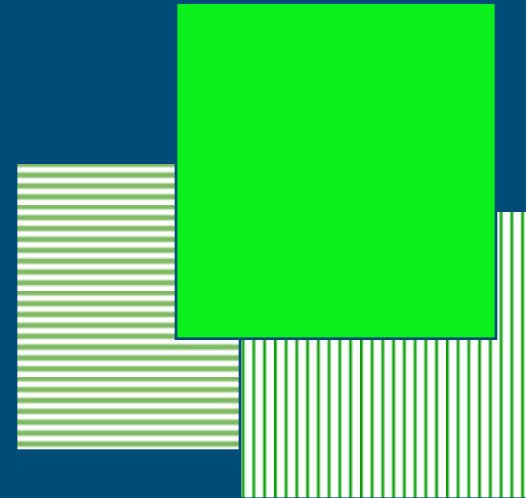
Steps forwards in IPM



Calendar spraying
Applications without
control presence of pest



Guided control
Application based on
observations



IPM: chemical control
as the final step



COMMUNICATION

The start of IPM

- Introduction of *Phytoseiulus persimilis* for spider mite control in cucumber
- Introduction of *Encarsia formosa* for control of white fly in tomato



Oldest IPM crop

cucumber

- predatory mite *Phytoseiulus persimilis* => spider mite
- pirimicarb => aphids
- hydrogen cyanide => whiteflies
- systemic fungicide dimethirimol => powdery mildew

Largest IPM crop

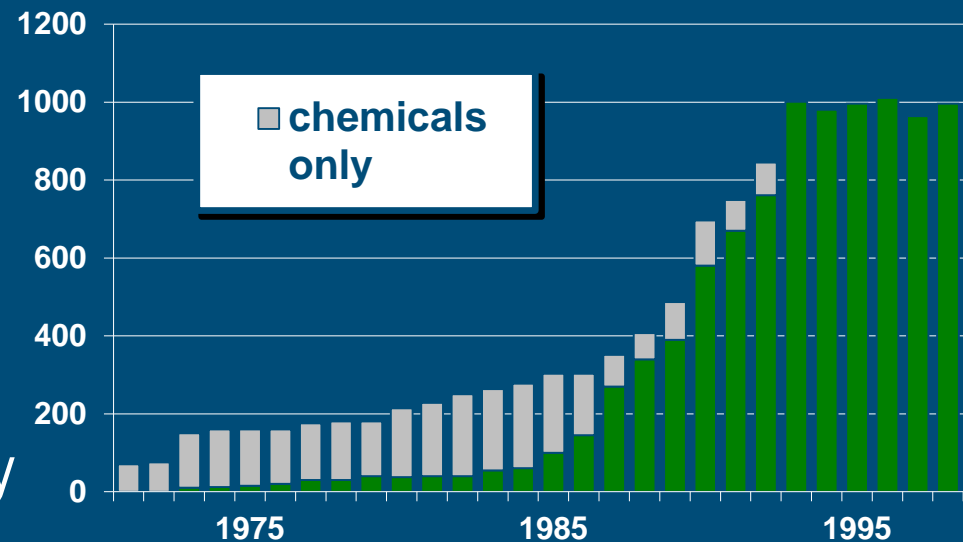
tomato

- moderate host plant for whitefly and aphids
- whitefly control
 - *Encarsia formosa*
 - corrections with Insect Growth Regulators
- aphid control
 - parasitoids
 - corrections with systemic insecticides
- leafminer control
 - natural control by parasitoids
 - occasional correction with cyromazine

Most succesful IPM crop

■ sweet pepper

- bad host plant for whitefly
- good host plant for aphids
- biological control of spider mites, thrips, aphids and Noctuids
- natural control of leafminers and aphids
- integrated control during about 90% of the season



Pest and diseases in rock melon in Malaysia

- Thrips
- Aphids
- Melon yellow spot virus
- Mildew
- And also: organic farming



Koppert, The Netherlands



aphids



beetles



Butterflies
and moths



Leaf miners



Mealy
bugs



Sciariid
flies



Spider
mites



thrips



Whiteflies

Thrips & Whitefly

- *Amblyseius swirskii* (predatory mite)
- Environmental conditions
 - tolerant to high temperatures
 - development when day temperature > 20-22°C
- Storage and handling
 - storage after receipt: 1-2 days
 - storage temperature: 10-15°C
 - in the dark
 - provide ventilation to prevent CO₂ accumulation
- Remarks
 - also development on pollen



World-wide implementation

- List of Biological Control Agents (EU) and Permit for Interstate Shipment (USA) are based upon broad expert knowledge, resulting in safe import in 60 countries.

Measures already implemented

- The greenhouse itself
- Sluices
- Sanitation



Short-term plan

- Obtain permission for testing
- Contact supplier
- Import procedures, customs
- Scouting plan
- Define soft chemicals
- Start with new crop
- Release biological control agent
- Monitor pest/predator density
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- Keep the crop healthy!

