IPM (Ecological based)

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Varities of chemical pesticides

Do chemical pesticide can control insect pest out break?

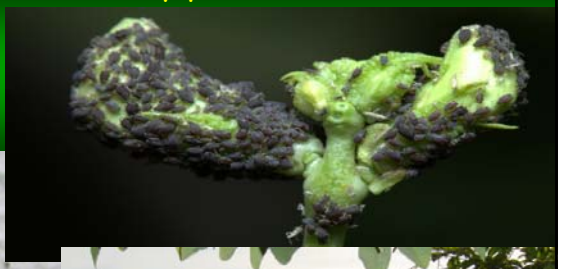
Constraint of chemical pesticides: increasing

- Health Hazard
- Residual effect
- Environmental contamination
- Problem increasing: losses,toxic, contamination etc.
- Marketting competition

•

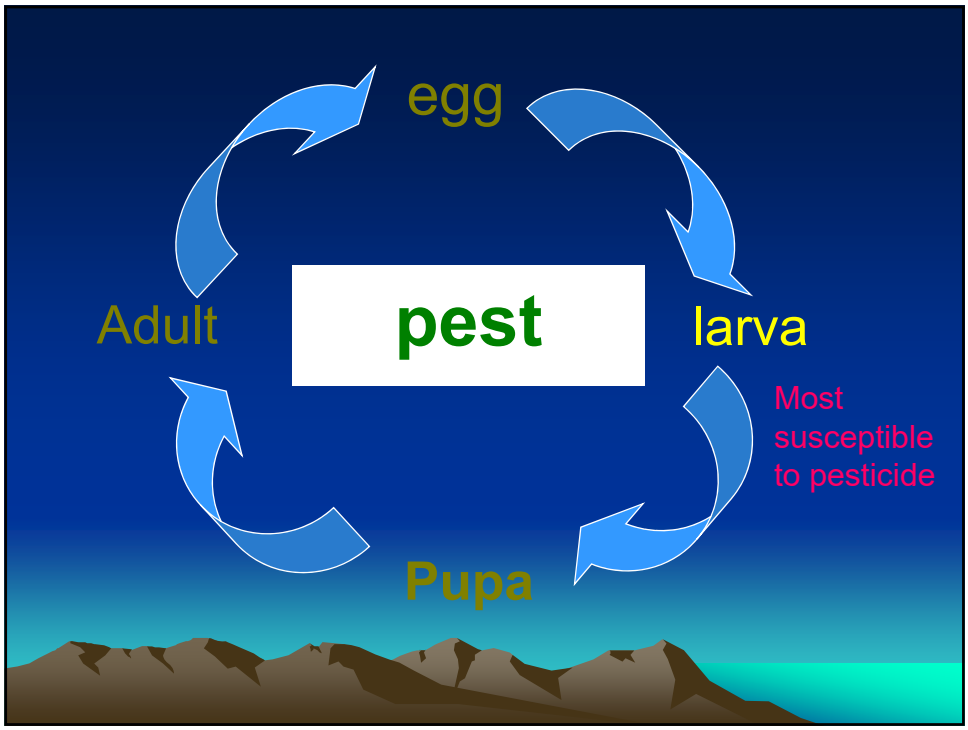
• Varieties of pests occur, Varieties of pesticides were used , High cost, Resistant to many pesticides Pesticides residue, Health hazard

•Pest Problems:



What is IPM?
WHY? IPM is needed

Integrated Pest Management

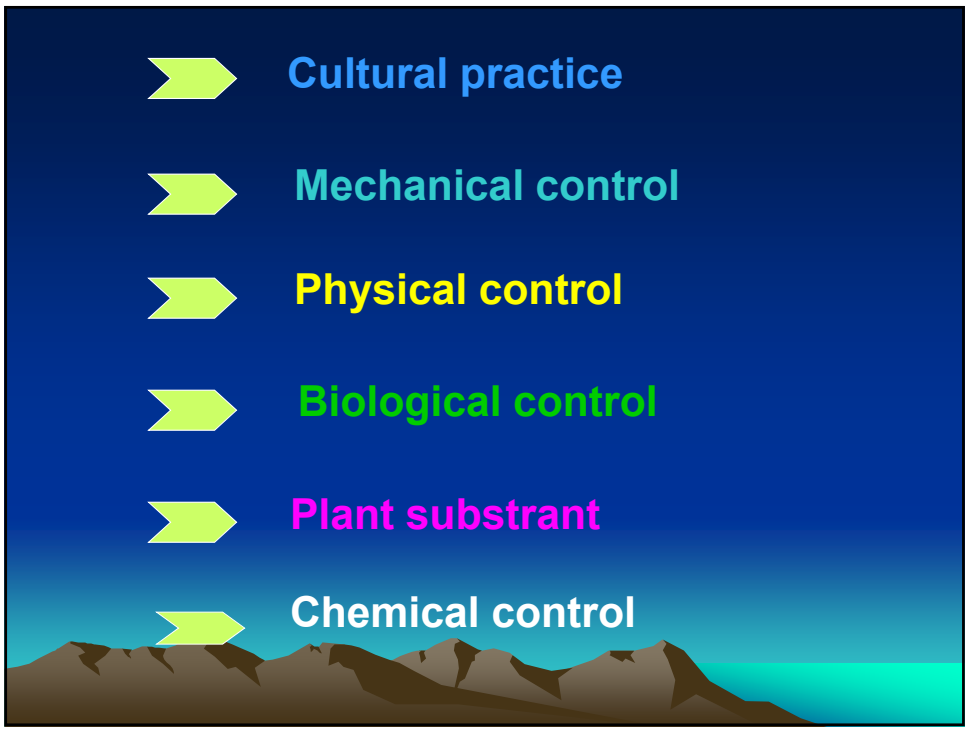

egg
Adult
pest
larva
Most
susceptible
to pesticide
Pupa


หนอนหัวดำมะพร้าว
ไข่ ๕-๖ วัน
วงจรชีวิต
หนอน ๓๒-๔๘ วัน
ตัวเต็มวัย ๕-๑๔ วัน
ดักแด้ ๙-๑๑ วัน

•เพลี้ยกระโดดสีน้ำตาลศัตรูข้าว

•เพลี้ยกระโดดสีน้ำตาล


IPM
Integrated Pest Management
Pest control need more than 1 method

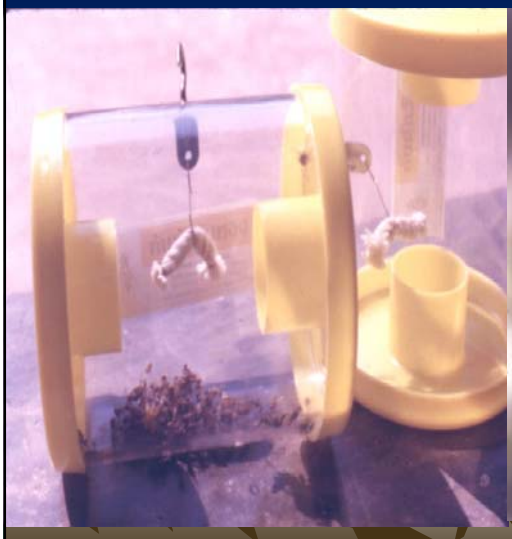

Cultural practice
Mechanical control
Physical control
Biological control
Plant substrant
Chemical control

New technology to grow vegetable

- Cultural control

•Sanitation infested field

•Mechanical control



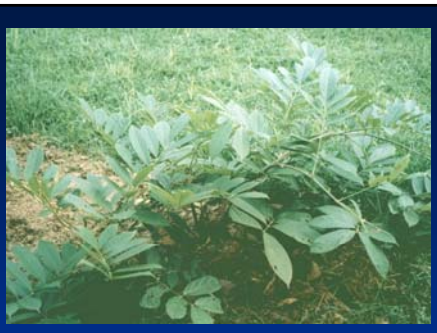
•Mechanical control

•Physical control

•Mechanical control

•Light trap

•Herb



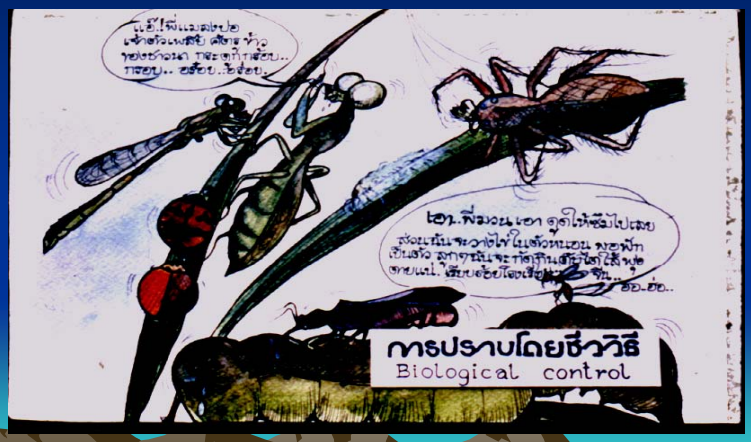
•Herb

Natural control

Red ants

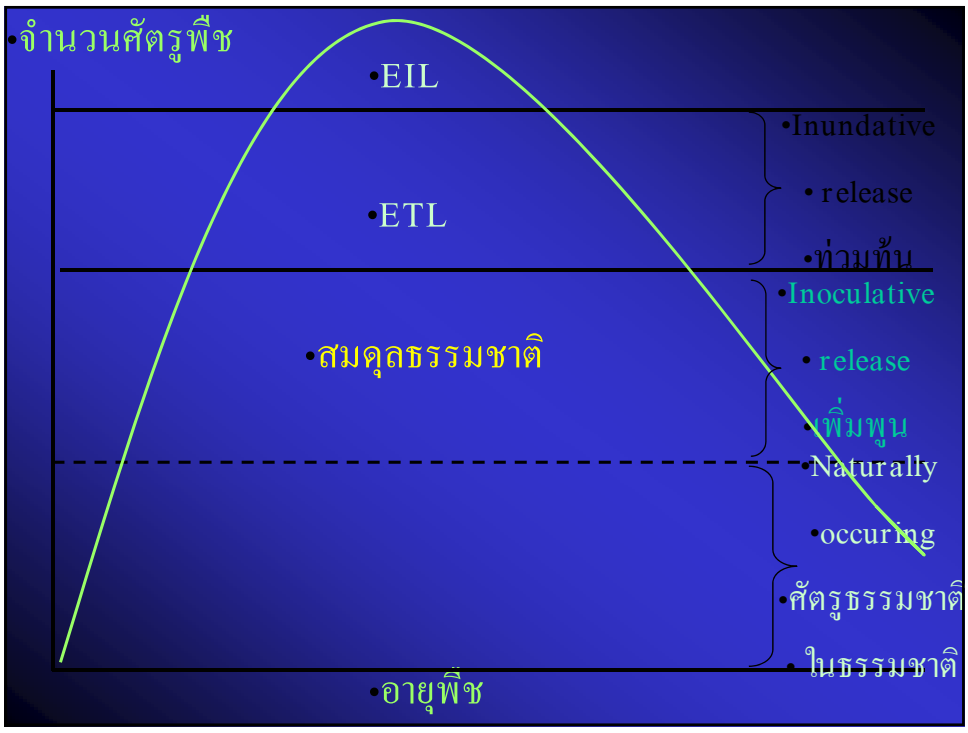
- Control mango pest
- Control longan pest

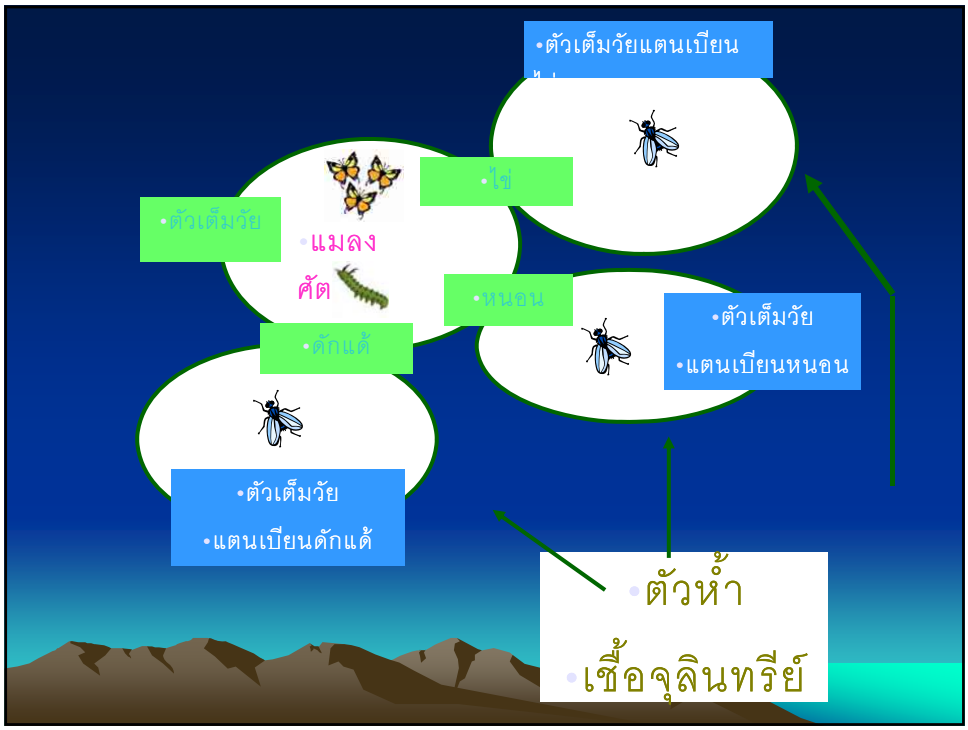
Biological Control



- แตนเบียนทำลายหนอน

•Last method in IPM is Chemical control





Why?

Biological control are needed

BIOLOGICAL CONTROL

BENEFICIAL LIVING ORGANISM

NATURAL ENEMIES

PREDATOR , PARASITE, MICRO - ORGANISM

Biological control (natural enemies) (continue..)

- *Free service from nature.*
- *Work any time.*
- *Building up population related to the pest population.*

ADVANTAGES OF BIO - CONTROL

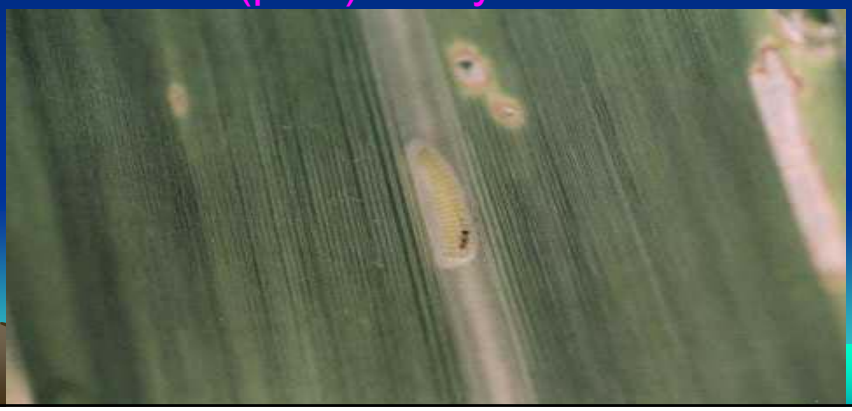
- HOST SPECIFIC
- HARMLESS TO NON - TAGET
- HIGH EFFICIENCY Suppress the pest population lower than threshold
- AVOID PEST RESISTANCE
- EASY APPLICATION

Predator

Living organism consume pest,
Suppress pest population lower than threshold level

parasite

Living organism live in host and kill host ,cut the host (pest) life cycle



Micro – organism

Pathogen infected pest cause disease to kill pest.

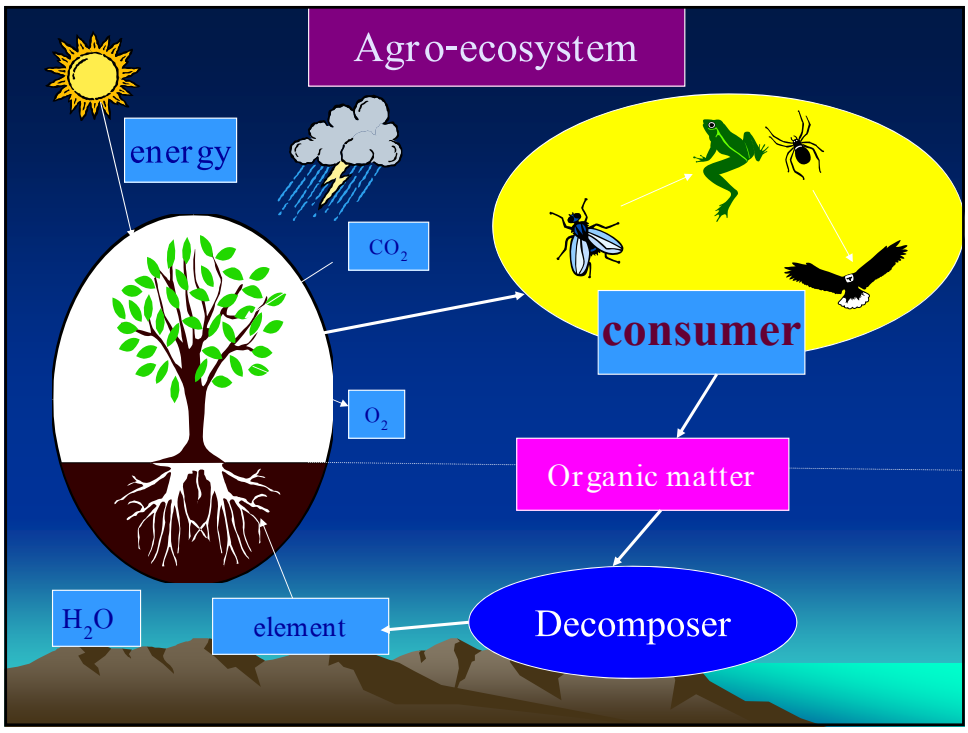
Suppress pest population under threshold level.

MICRO - ORGANISM

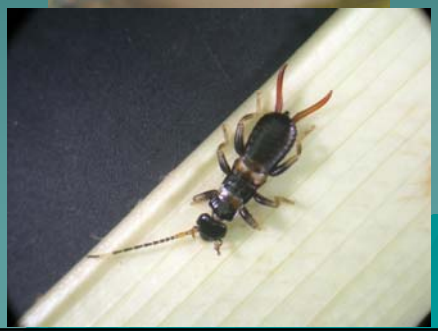
- ***Beauveria***
- ***Trichoderma***
- ***Metarrhizium***
- ***Virus NPV - 3 kind***
- ***Bt***

Where

To get the biological control

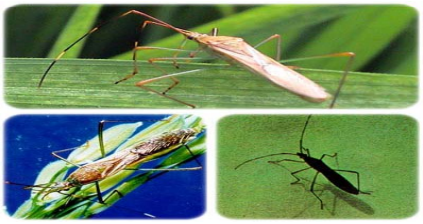


All earwig are predator



All lacewings are predator

- **Most bug are predator**



All dragon and damsel fly are predator

WHY ? AUGMENTATION

- Naturally occuring biological control are limited
- Some Special Pest that are difficult to control by any other method or factors
- Limitation of chemical pesticide

How?

- To use biological control or
- IPM method

Using biological control agents

:Most biological controls are used after the target pest is found with highly population.

This should be avoid.

In fact biological control need to apply ahead of time (before infestation).
Apply biological control early in the season when the pest occured

What we have done?

Implementation biological control in IPM to farmer practice through FFS

- ***IPM implementation to the farmer practice***

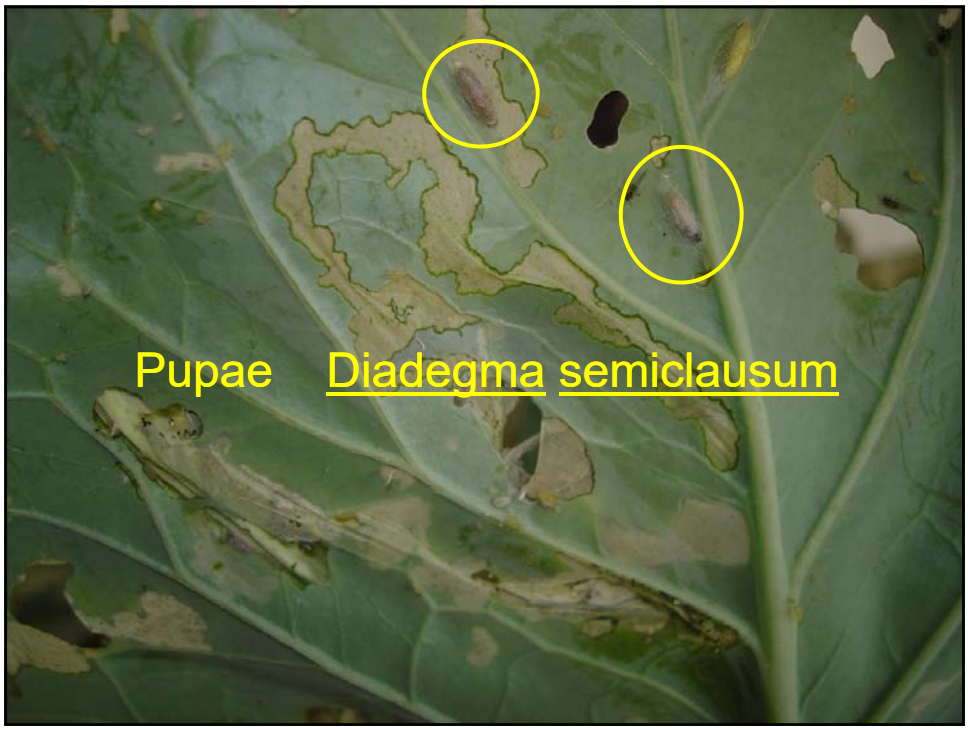
Farmer participation

Experience learning


HONDA


•FFS activities

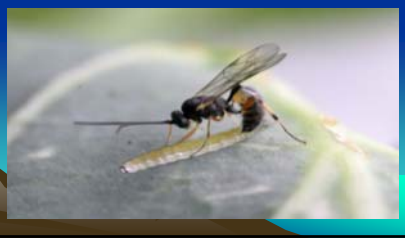
Diamondback moth (DBM)



DBM parasitoid

Diadegma semiclausum

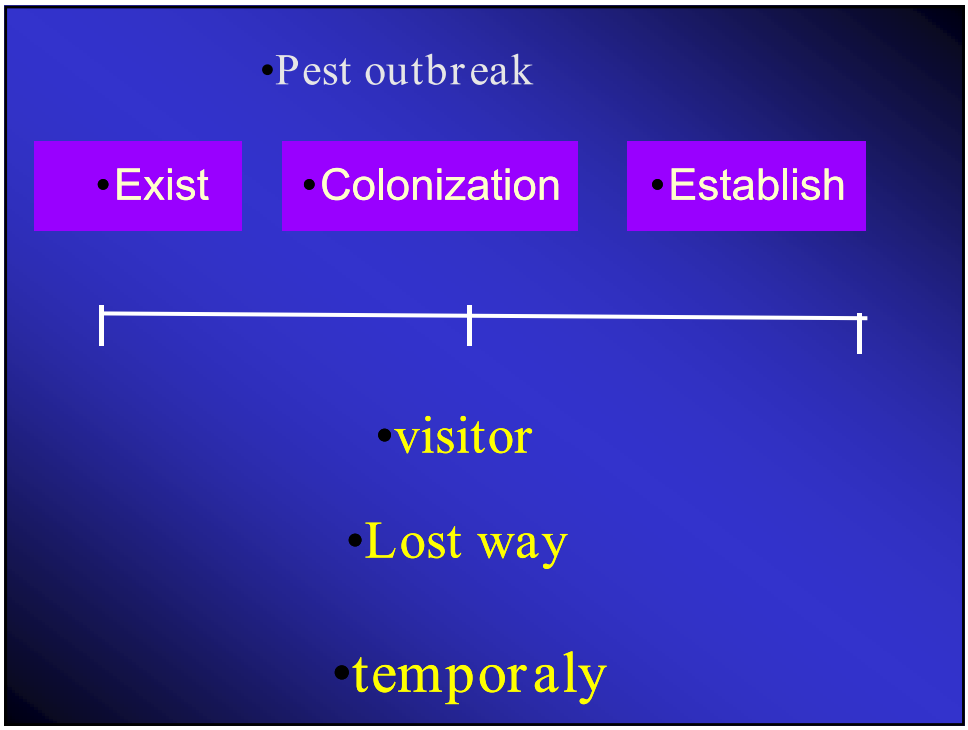
(DBM larval parasitoid)

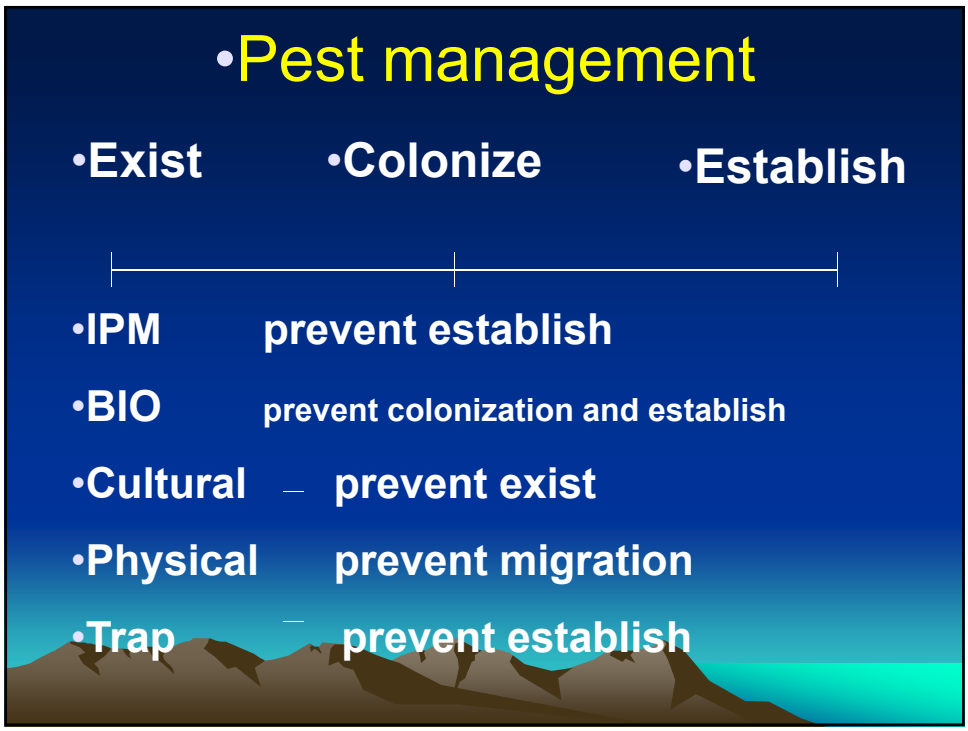


Agro-Eco-System-Analysis(AESA)

- ETL may not useful to make decision for pest control
  - no NE , no determine age of plant, no determine weathering data
  - ETL induce over chemical spraying

•Pest 100 •No NE	•Pest 200 •100 NE


•Pest outbreak
•Exist
•Colonization
•Establish
•visitor
•Lost way
•temporaly

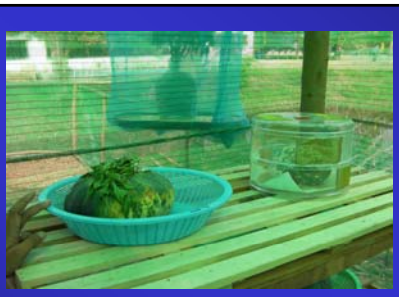

•Pest management
•Exist
•Colonize
•Establish
•IPM prevent establish
•BIO prevent colonization and establish
•Cultural – prevent exist
•Physical prevent migration
•Trap – prevent establish

Community Pest Management Center (CPMC)

IPM implementation : farmer practice through Community Pest Management Centers - CPMC

- All of the process should be done by farmers under the guidance of agricultural extensionist
- DOAE, Thailand established the 882 Community Pest Management Centers
- CPMC was managed by farmer s, extensionists and local government together with 30 farmers member: activities are
  - pest monitoring
  - Planning for pest control
  - Decision making
  - Control action

Community Pest Management Center (CPMC)



- **Community Pest Management Center**

•*Farmer training course on IPM and biological control*

•*Farmer training course on Beauveria bassiana production for farmer at DoAE Pest Management Center*

Ds rearing

•Farmer rearing place

Introduce Lacewing to farmer

Preparation for releasing

Release larva of lacewings

•แมลงหางหนีบใช้ในไร่อ้อย

•การผลิตขยายเชื้อจุลินทรีย์โดยเกษตรกร

•Farmer producing pure culture of fungus on artificial media under clean condition by

training and demonstration

Use **Trichoderma** to control root,stem rot

•ด้วงแรดมะพร้าวถูกเชื้อราเขียวทำลาย

(Phyllotreta striolata)

•Flea beetle

Flea beetle infest Brassica crop

Integrated pest management

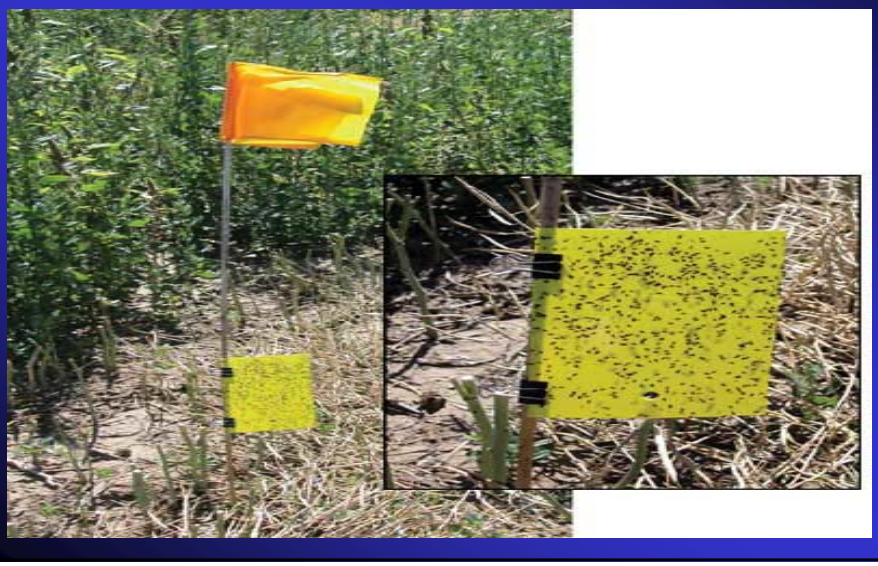
→Use IPM methods to control:

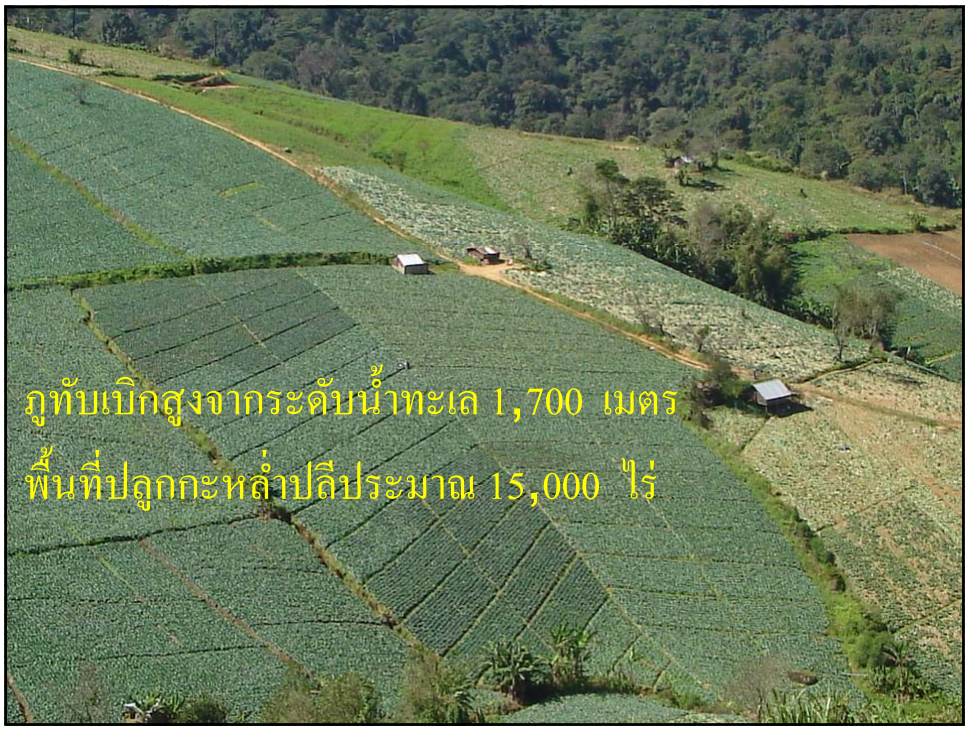
→ Mechanical control to control adults

→ Biological to control eggs larvae and pupae

•รูดด้ายถูกลูกกระสุนปืน ที่เกิดกับกะหล่ำปลี

Yellow sticky trop to trap adults
earwigs to control eggs larvae and pupae
use *Metarhhizium* to control flea beetle before planting




ภูทับเบิกสูงจากระดับน้ำทะเล 1,700 เมตร
พื้นที่ปลูกกะหล่ำปลีประมาณ 15,000 ไร่


FAO
PLANT PANTS
FAO IPM
vegetable
REGIONAL PROGRAMME


เก็บข้อมูล

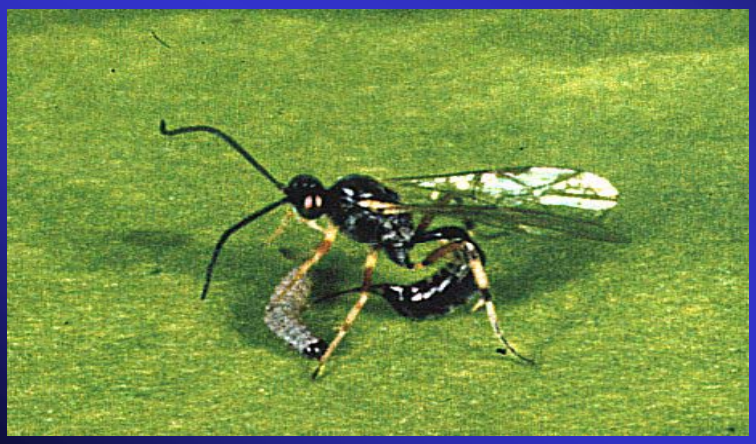

Field monitoring


• สำรวจแปลง


HONDA




•*Diadegma semiclausum* (DBM larval parasitoid)



แตนเบียนใช้ในการควบคุมศัตรูพืชกะหล่ำปลี

•***Diadromus collaris*** (DBM pupal parasitoid)

หนอนใยผักอาศัยอยู่ในที่ปลอดภัย

- Egg and lavae usuallly are under feaves
- Pupae covered with thick skin

• Worm parasitoid

•IPM and biological control field

•Use Bt to control Lepidoptera larvae

•Release *D. semiclausm* , laval parasitoid to control DBM

•Use *T.harsianum* to control pathology

สำรวจและทำแปลงทดลอง

เผยแพร่ความรู้แก่นักเรียนนักศึกษา

• ผลิตภัณฑ์ เชื้อบีทีมีจำหน่ายในท้

• Worm dead by Bt

• Bt (Bacillus thuringiensis)


• Before the project farmer spray avg. 12 times/crop(8-25)

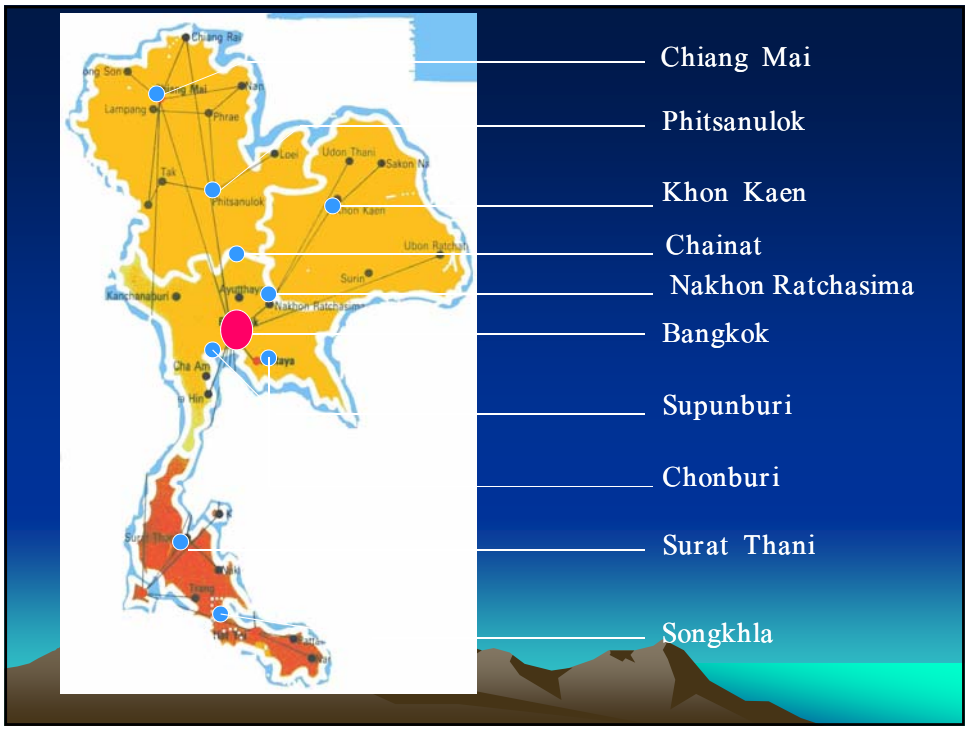

• After the project , the farmer only use chemical 3 times and some were stop spraying

Many consumers get used to

Q mark produces and products

Produces from King projects

with Q mark become popular in supermarket


Chiang Mai
Phitsanulok
Khon Kaen
Chainat
Nakhon Ratchasima
Bangkok
Supunburi
Chonburi
Surat Thani
Songkhla


SAWASDEE