



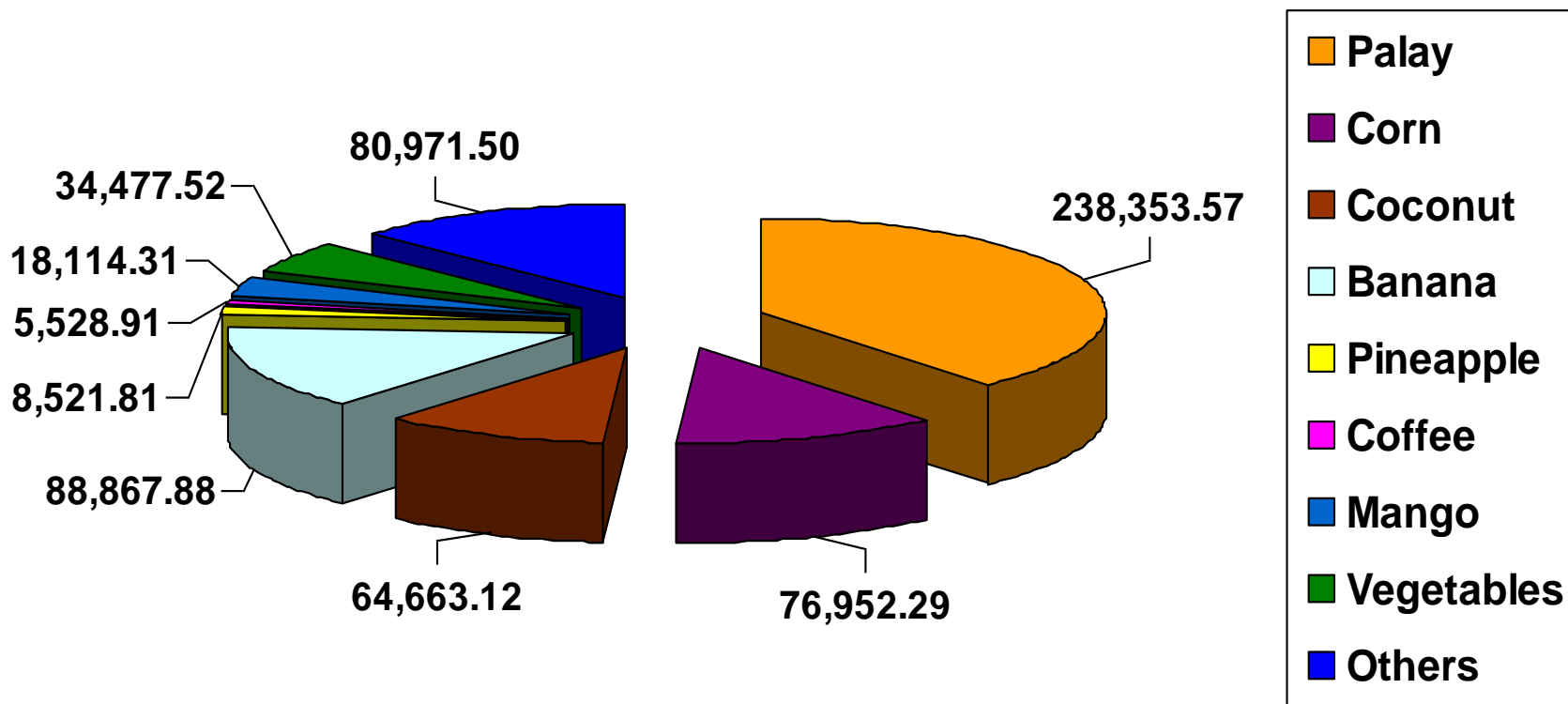
Philippine Vegetable IRM Recommendations and Training Plans

IRAC Philippines Diamide Working Group

Sixth International Workshop on Management of the Diamondback Moth
Kasetsart University, Thailand
March 21-25, 2011

Agriculture in the Philippines

Value of Production (in Billion Php)



Source: Bureau of Agricultural Statistics , 2009

- ❑ **Vegetables are regarded as high value crops with a production value of about 34.5 B PHP**
- ❑ **Farmers practice intensive insect pest control to protect their crops from insect pests**
- ❑ **DBM is one of the most important pest infesting vegetables cabbage in particular. It is recognized as a high risk pest as far as resistance development is concerned**
- ❑ **No joined sustained efforts by all stakeholders on resistance management**

Registered and Commonly Used Insecticides against DBM

Chemical Sub-group	Active ingredient	Mode of Action	Main Group
Bacillus	BT	microbial disruptors	11
Organophosphates	Profenophos, Malathion	AChE inhibitors	1
Pyrethroids	Deltamethrin, Cypermethrin, Fenvalerate	Sodium Channel modulators	3
Avermectins	Abamectin	Chloride Channel Activators	6
Indoxacarb	Indoxacarb	Sodium Channel blockers	22
Diamides	Flubendiamide, chlorantraniprole	Ryanodine receptors modulators	28
Spinosyns	Spinosad	nAChr allosteric activators	5
Diafenthiuron	Diafenthiuron	Mitochondrial ATP synthase inhibitors	12
Nereistoxin analogues	Cartap	nAChr channel blockers	14



Current Situation- Diamides

Intensive Commercial Production Areas of Cabbage in the Philippines



Summary of Survey Findings

Incidence of use

High incidence of diamide use

Frequency of spray

12 sprays in a season; around 70% or higher uses diamide products

Rotation

Rotation with compounds from other chemical classes/modes of action is generally not practiced

Dosing

Observed overdosing

Based on survey of 100 farmers in Sudlon Cebu

Philippine IRAC Diamide Working Group

- Formed IRAC Diamide WG in 2009: develop IRM strategy against DBM in cabbage
- Closely coordinating with IRAC International and IRAC SEA on resistance management
- Recently, IRAC was integrated in the Product Stewardship Committee of CropLife Philippines

IRAC Philippines Diamide WG Members



Ariel Anico
Syngenta



Aaron Cano
Bayer CropScience



Ronald Arabit
Bayer CropScience



Oscar Edralin
Du Pont



Nap Saavedra
Syngenta



Florence Vasquez
Bayer CropScience



Rodel Macatula
Du Pont

Rhoel Suiza
Syngenta



IRAC Philippines Project



IRAC Philippines Project

Develop and launch an insect resistance management program against DBM in cabbage with the following components:

- 1. IRM strategy**
- 2. Educational campaign**
- 3. Assessment /Monitoring**

Objectives

- **Educate stakeholders (company reps, farmers, government, and in close collaboration with research and educational institutions involved in agriculture) on the principles and practice of insect resistance management**
- **Maintain insect susceptibility of registered compounds as viable/effective option in integrated pest management programs**
- **Contribute to the sustainability of Philippines vegetable production**

Action Points

- **Provide sustainable alternatives for vegetable insect pest management**
- **Involve all stakeholders (government officials including regulators, academe, extension workers, farmers, industry)**
- **Assess effectiveness of the program through pre /post evaluation**



Process

- 
- Stage 1 : Train the trainers program which will participated by company representatives local government research and extension staff, academe**
- a .Develop training module**
 - b. Training of trainers (TOT) in project sites**
 - c Pre and Post Assessment**



Stage 2 : Farmers training

- a. Production of training material**
- b. Training of farmers in project sites**
- b. Pre and Post Assessment (survey)**

Train the trainers workshop will be conducted in the following project areas

Area	Crop	Date	# of Participants
Benguet	Cabbage	May 17	100
Pangasinan	Eggplant	May 19	60
Cebu	Cabbage	June 7	30
Bukidnon	Cabbage	July 5	36
Davao	Cabbage	July 19	30
Quezon	Eggplant	August 2	50
Batangas	Eggplant	August 16	40

Farmers Training will be conducted in the following project areas

Area	Crop	# of Participants
Benguet/Ilocos	Cabbage	3000
Pangasinan	Eggplant	400
Cebu	Cabbage	400
Bukidnon	Cabbage	300
Davao	Cabbage	300
Quezon	Eggplant	200
Batangas	Eggplant	400

TOPICS IN THE IRM TRAINING

- **Integrated Pest Management**
- **General Principles of Resistance Management**
- **Insect Resistance Management: Experience in cabbage and eggplant**
- **Maintaining Susceptibility to registered products (e.g diamides) in vegetables, An Industry responsibility**
- **Product Stewardship**

Project Activities and Timelines

Activities	Timeline
1. Develop educational material on maintaining susceptibility of DBM to registered compounds e.g diamides in cabbage	2010
2. Obtain funding from IRAC	Feb 2011
3. Prepare for the training proper to include training module development	Feb- April 2011
2. Train the trainers wokshop	May- Aug, 2011
3. Farmers training	Nov 2011- March 2012
4. Follow ups and Post evaluation	May 2012- March 2013

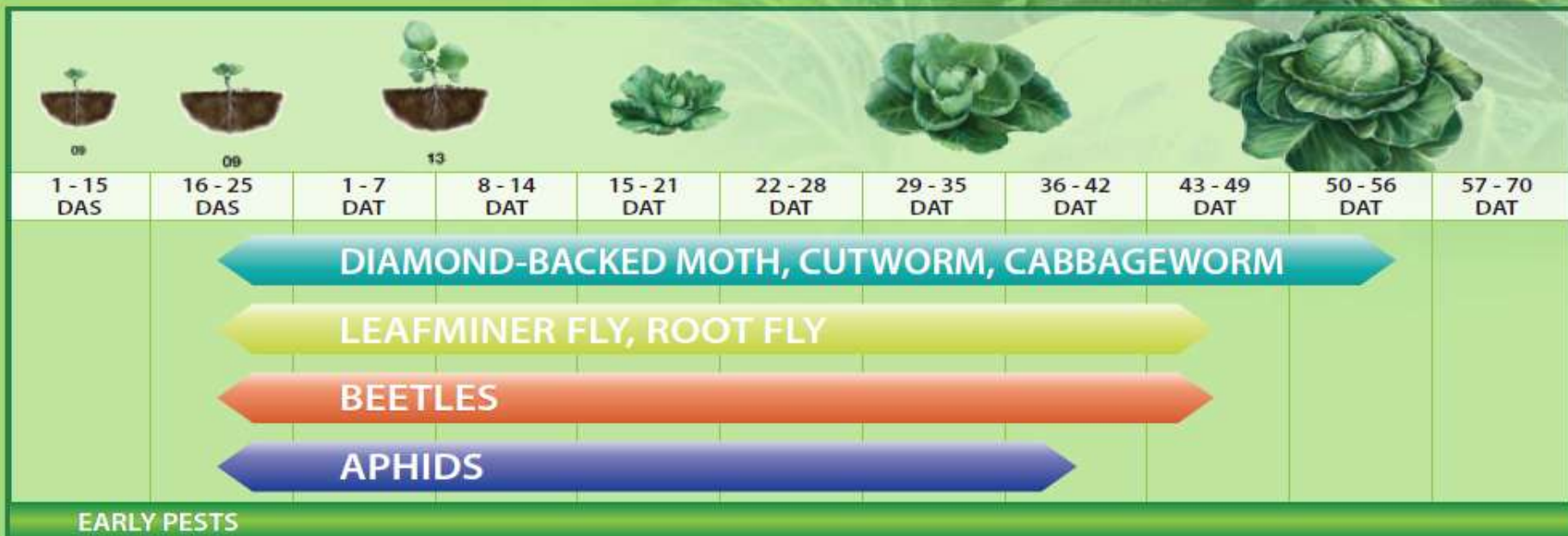
IRM Strategy

A spray program using insecticides of a different mode of action against each generation of DBM

Maintaining Susceptibility to Vegetable Insecticides (eg: Diamides) – An industry responsibility

Diamide Resistance Management (DRM) Strategy for Cabbage Worms:

AN EXAMPLE of a DRM program that rotates Group 28 products (Diamide insecticides) with alternative modes of action. For more specific spray timings of Fenos®, Prevathon®, and Voliam Flexi® to initiate the Group 28 active window, see company recommendations.



EARLY PESTS

SEED NURSERY

TRANSPLANTING

LEAFY STAGES

HEAD FORMING





HARVESTING

1» Other registered insecticides	Other registered insecticides	Other registered insecticides	Other registered insecticides	Other registered insecticides	Other registered insecticides	Fenos® Prevathon® Voliam Flexi®	Fenos® Prevathon® Voliam Flexi®	Fenos® Prevathon® Voliam Flexi®	Other registered insecticides	Other registered insecticides
2» Other registered insecticides	Fenos® Prevathon® Voliam Flexi®	Fenos® Prevathon® Voliam Flexi®	Fenos® Prevathon® Voliam Flexi®	Other registered insecticides	Other registered insecticides	Other registered insecticides	Other registered insecticides	Other registered insecticides	Other registered insecticides	Other registered insecticides

NOTE: Insecticides belonging to other modes of action and/or other means of control

Diamide Resistance Management (DRM) Strategy for Eggplant Borer:

AN EXAMPLE of a DRM program that rotates Group 28 products (Diamide insecticides) with alternative modes of action. For more specific spray timings of Fenos®, Prevathon®, and Voliam Flexi® to initiate the Group 28 active window, see company recommendations.

GROWTH STAGE	SEEDLING	VEGETATIVE	FLOWERING	FRUITING																					
																									
DAYS AFTER PLANTING	7	14	21	26	35	42	49	56	63	70	77	84	91	98	106	112	118	126	138	140	147	154	161	168	173
WEEK #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25

Other registered Insecticides	Fenos® Prevathon® Voliam Flexi®	Fenos® Prevathon® Voliam Flexi®	Other registered Insecticides	Other registered Insecticides	Fenos® Prevathon® Voliam Flexi®	Fenos® Prevathon® Voliam Flexi®	Other registered Insecticides	Other registered Insecticides	Fenos® Prevathon® Voliam Flexi®	Fenos® Prevathon® Voliam Flexi®	Other registered Insecticides	Other registered Insecticides	Fenos® Prevathon® Voliam Flexi®	Fenos® Prevathon® Voliam Flexi®	Other registered Insecticides
-------------------------------	---------------------------------------	---------------------------------------	-------------------------------	-------------------------------	---------------------------------------	---------------------------------------	-------------------------------	-------------------------------	---------------------------------------	---------------------------------------	-------------------------------	-------------------------------	---------------------------------------	---------------------------------------	-------------------------------

NOTE: Insecticides belonging to other modes of action and/or other means of control



Acknowledgement

IRAC International

IRAC SEA



THANK YOU FOR YOUR ATTENTION

Maraming Salamat Po