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USDA's Pest Free Areas Recognition Process

Devaiah A. Muruvanda, Ph.D.
Senior Risk Manager – Entomology

United States Department of Agriculture
Animal and Plant Health Protection Service
Plant Protection and Quarantine

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Pest Free Areas

Definition from ISPM 4:

A "pest free area" is: "an area in which a specific pest does not occur as demonstrated by scientific evidence and in which, where appropriate, this condition is being officially maintained".

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Concept of a Pest-free Area

- Recognize biological, physical or other natural limiting factors to limit pest incursion – buffer zone
- Must effectively regulate movement of host material into the area – quarantine regulations
- Requires monitoring / surveillance of pest(s) of concern
- Must include contingency plans for pest finds or outbreaks

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Pest Free Areas

Recognition of Pest Free Areas by APHIS is regulated by Federal Regulations

APHIS recognizes Pest Free Areas in accordance with 7 CFR 319-56-5

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Pest Free Areas

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http://www.ecfr.gov/cgi-bin/ECFR?page=browse

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Areas recognized by APHIS as Pest Free Areas

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Pest-free Areas

The following table lists countries and associated areas that meet the APHIS requirements for designated pest-free areas in accordance with 7 CFR 319.56-5

Country	Pest(s)	Pest-free Area
Argentina	Mediterranean fruit fly (Medfly) (Ceratitis capitata) and Anastrepha spp. fruit flies	The Patagonia provinces of Neuquen, Rio Negro, Chabut, Santa Cruz, and Tierra del Fuego. This includes areas along the valleys of the Rio Colorado and Rio Negro rivers and areas of the southern part of the Mendoza province, south of the following coordinates: lat 33° 13' 40.98" S, length 69°54' 36.60" W; lat 33° 13' 40.98" S, length 69°04' 18.24" W; lat 33° 29' 29" S, length 68° 58' 22" W; lat 34° 02' 47" S, length 67° 57' 17" W; lat 34° 02' 47" S, length 68° 44' 05.65" W
Australia	Mediterranean fruit fly (Medfly) (Ceratitis capitata), the Queensland fruit fly (Bactrocera tryoni) and other fruit flies destructive of citrus	(1) The Riverland district of South Australia, defined as the county of Hamley; the geographical subdivisions, called hundreds, of Bookpurnong, Cadell, Eba, Fisher, Forster, Gordon, Hay, Holder, Katarapko, Loveday, Markaranka, Morook, Murbko, Murtho, Nildottie, Paisley, Parcoola, Pooginook, Pyap, Ridley, Skurray, Stuart, and Waikerie; and the Parish of Onley of the Shire of Mildura, Victoria; (2) The Riverina district of New South Wales, defined as: (i) The shire of Carrathool; and (ii) The Murrumbidgee Irrigation Area, which is within the administrative boundaries of the city of Griffith and the shires of Leeton, Narrandera, and Murrumbidgee; (3) The Sunraysia district, defined as the shires of Wentworth and Balranald in New South Wales and the shires of Mildura, Swan Hill, Wakool, and Kerang, the cities of Mildura and Swan Hill, and the borough of Kerang in Victoria
	Mediterranean fruit fly (Medfly) (Ceratitis capitata) and the Queensland fruit fly (Bactrocera tryoni)	Tasmania
	Mediterranean fruit fly (Medfly) (Ceratitis capitata)	Eastern Australia, defined as the Northern Territory, Queensland, South Australia, New South Wales, and Victoria
	Queensland fruit fly (Bactrocera tryoni)	Western Australia

http://www.aphis.usda.gov/import_export/plants/manuals/ports/downloads/DesignatedPestFreeAreas.pdf

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Pest Free Areas
What is in the CFR?

§ 319.56–5 Pest-free areas.
As provided elsewhere in this subpart, certain fruits and vegetables may be imported into the United States provided that the fruits or vegetables originate from an area that is free of a specific pest or pests. In some cases, fruits or vegetables may only be imported if the area of export is free of all quarantine pests that attack the fruit or vegetable. In other cases, fruits and vegetables may be imported if the area of export is free of one or more quarantine pests that attack the fruit or vegetable, and provided that the risk posed by the remaining quarantine pests that attack the fruit or vegetable is mitigated by other specific phytosanitary measures contained in the regulations in this subpart.

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Pest Free Areas
International Standards

(a) Application of international standard for pest free areas.

APHIS requires that determinations of pest-free areas be made in accordance with the criteria for establishing freedom from pests found in International Standard for Phytosanitary Measures No. 4, "Requirements for the establishment of pest free areas." The international standard was established by the International Plant Protection Convention of the United Nations' Food and Agriculture Organization and is incorporated by reference in § 300.5 of this chapter.

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Pest Free Areas

ISPMs

ISPM 4 - Requirements for the Establishment of Pest Free Areas
ISPM 26 - Establishment of Pest Free Areas for Fruit Flies (Tephritidae)
ISPM 29 - Recognition of Pest Free Areas and Areas of Low Pest Prevalence

ISPM 6 - Guidelines for Surveillance
ISPM 8 - Determination of Pest Status in an Area
ISPM 9 - Guidelines for Pest Eradication Programmes
ISPM 10 - Requirements for the Establishment of Pest Free Places of Production and Pest Free Production Sites
ISPM 22 - Requirements for the Establishment of Areas of Low Pest Prevalence
ISPM 30 - Establishment of Areas of Low Pest Prevalence for Fruit Flies (*Tephritidae*)

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Pest Free Areas

What is in the CFR?

(b) Survey protocols.

APHIS must approve the survey protocol used to determine and maintain pest-free status, as well as protocols for actions to be performed upon detection of a pest. Pest-free areas are subject to audit by APHIS to verify their status.

(c) Determination of pest freedom.

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Pest Free Areas

What is in the CFR?

(c) Determination of pest freedom.

The determination of pest freedom is based on ISPM-4 and other appropriate ISPMs.

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Pest Free Areas

What is in the CFR?

(c) Determination of pest freedom.

(1) For an area to be considered free of a specified pest for the purposes of this subpart, the Administrator must determine, and announce in a notice or rule published in the FEDERAL REGISTER for 60 days public comment, that the area meets the criteria of paragraphs (a) and (b) of this section.

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Types of Pest Free Areas
excerpt from ISPM 4

"Although the term 'pest free areas' encompasses a whole range of types (from an entire country which is pest free to a small area which is pest free but situated in a country where that pest is prevalent), it has been found to be convenient to discuss the requirements of PFAs by defining three types:

- an entire country
- an uninfested part of a country in which a limited infested area is present
- an uninfested part of a country situated within a generally infested area."

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Pest Free Areas

Interpreting the CFR

APHIS can recognize pest free areas that are the entire country or a part of a country.
When the area proposed as a Pest Free Area becomes very small, relative to the infested area, then this becomes a Pest Free Place of Production.

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Pest Free Areas

Interpreting the CFR

How small can an area can be recognized as a Pest Free Area?

The small size of an area has implications in maintenance of the area free of pests.

The type and mobility of the pest becomes a key issue.

A very small Pest Free Area may not be appropriate for pests that are highly mobile, especially where the commodity is a good host.

This small PFA may be more successful for pests that are not mobile, and for 'poor' hosts. Very small PFAs are sometimes referred to as Pest Free Places of Production.

APHIS will tend to recognize these very small PFAs as systems approaches which would currently require full rulemaking.

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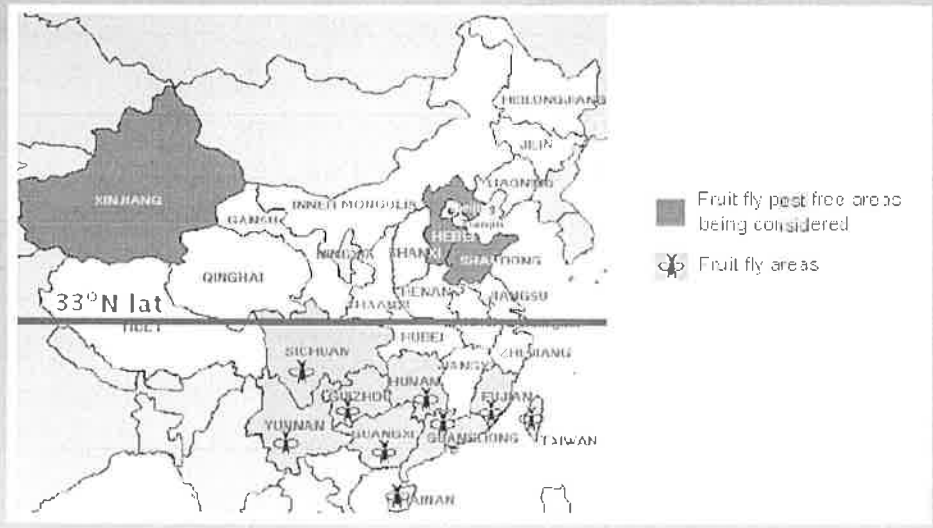
Pest Free Areas



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Pest Free Areas
from ISPM 4

"Three main components or stages are considered in the establishment and subsequent maintenance of a PFA:

- systems to establish freedom
- phytosanitary measures to maintain freedom
- checks to verify freedom has been maintained."

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Pest Free Areas
from ISPM 4:

"The nature of these components will vary according to the biology of the pest, the types and characteristics of the PFA and the level of phytosanitary security required, as based on pest risk analysis. The methods used to achieve these components may include:"

- data assembly
- surveys (delimiting, detection, monitoring)
- regulatory controls
- audit (review and evaluation)
- documentation (reports, work plans).

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Pest Free Areas

What information does APHIS need to recognize an area as pest free?

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Pest Free Areas

What information does APHIS need to recognize an area as pest free?

North American Plant Protection Organization Regional Standards on Phytosanitary Measures Number 17;
Guidelines for the Establishment, Maintenance and Verification of Fruit Fly Pest Free Areas in North America

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Pest Free Areas
What information does APHIS need to recognize an area as pest free?

1. Location Location Location !

A Geographic description of the proposed PFA is essential and should include:

Maps with the PFA delineated.
Natural barriers and buffer zones identified.
Locations of places of production
Locations of control points

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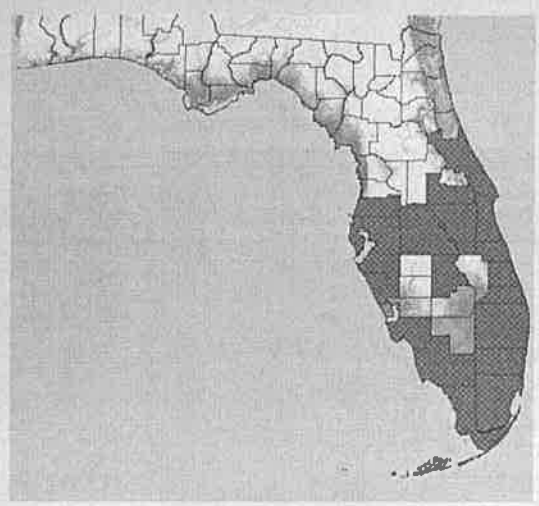
Elements of a Pest-free Area

- Geographic description
- Maps



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Pest Free Areas
What information does APHIS need to recognize an area as pest free?

1. **Location Location Location !**

Maps with the PFA delineated – What would APHIS evaluate?
Is the area proposed a candidate for a PFA?
Are there buffer zones / natural barriers?
How does the flight ability of the pest match up to the size of the area?
Are control points located on routes into the area?

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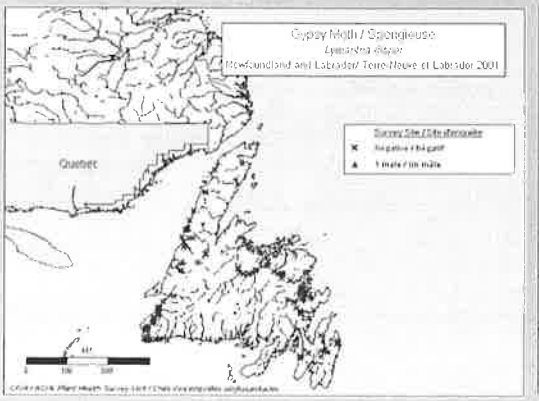
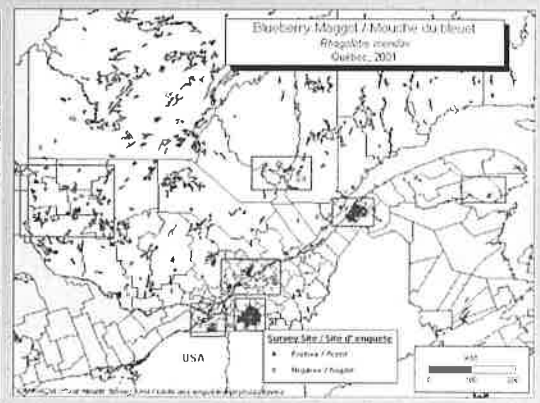
Elements of a Pest-free Area

- Geographic description

- Maps





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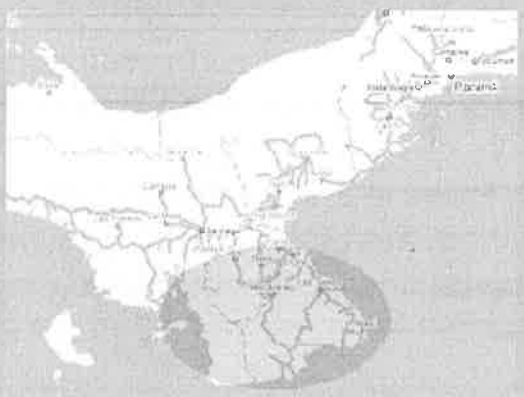
Pest Free Areas

What information does APHIS need to recognize an area as pest free?



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Elements of a Pest-free Area

- Geographic description
  - Natural barriers; mountains, deserts

Buffer Zones

The size of the buffer zone must take into account the biology of the pest. Trapping or surveillance is increased in the buffer zone.

If pests are found in the buffer zone, mitigation measures (emergency action plan) must be applied.

If the pests are found in the production zone, exports may be halted (unless there are other mitigations available such as an approved quarantine treatment) until an investigation and further surveillance has found that the pests are eliminated.

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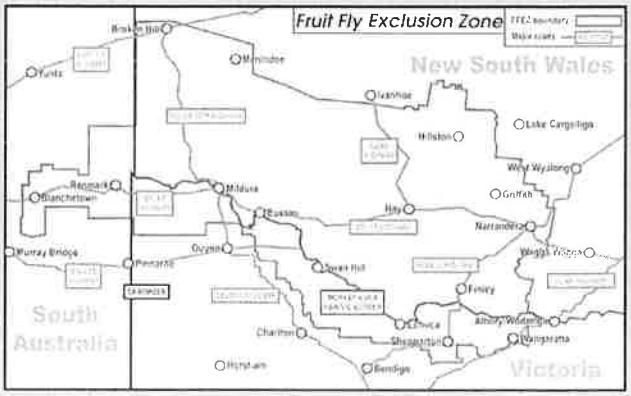
Elements of a Pest-free Area

- Geographic description
- Location of regulatory checkpoints



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Pest Free Areas

What information does APHIS need to recognize an area as pest free?

Evidence for freedom of the pest of concern

- Survey data
- Historical data
- Climate information

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Pest Free Areas

What information does APHIS need to recognize an area as pest free?

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Pest Free Areas

What information does APHIS need to recognize an area as pest free?

Survey data
The CFR requires that the survey protocol be approved by APHIS.

Historical data

Climate information

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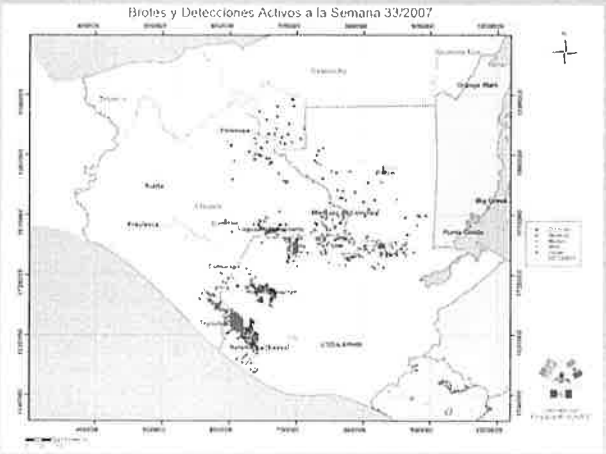
Elements of a Pest-free Area

- Survey Protocols
- Reporting of survey results



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Pest Free Areas

What information does APHIS need to recognize an area as pest free?

2. Survey protocols for establishment and maintenance of PFA:
a. trap type
b. bait or lure type
c. target pest
d. density of traps
e. servicing intervals
f. reporting of survey results

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Pest Free Areas

What information does APHIS need to recognize an area as pest free?

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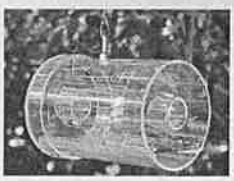

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Pest Free Areas

What information does APHIS need to recognize an area as pest free?

2. Survey protocols for establishment and maintenance of PFA:
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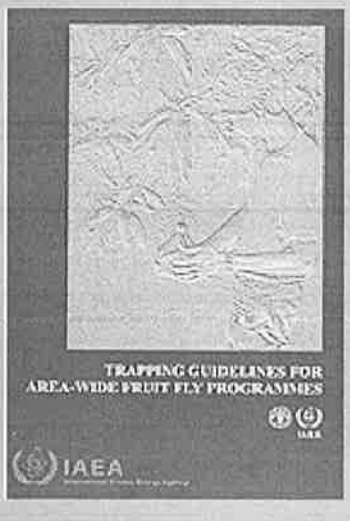

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Pest Free Areas

Trap Density

Ceratitis capitata

Scenario	Trap type	Attractant	Trap Density/km²			
			Production area	Marginal	Urban	Points of Entry
1-Monitoring of infested area	JT[1]/MULTILURE[2]/OBDT[2]/TEPHRI[2]	TML/3C/PB	0.5 to 1.0*	0.25 to 0.5*	0.25 to 0.5*	0.25 to 0.5*
1-Monitoring for suppression	JT[1]/MULTILURE[2]/OBDT[2]/TEPHRI[2]	TML/3C/PB	2 to 4*	1-2*	0.25 to 0.5*	0.25 to 0.5*
1-Monitoring for eradication	JT[1]/MULTILURE[2]/OBDT[2]/TEPHRI[2]	TML/3C/PB	3 to 5**	3 to 5**	3 to 5**	3 to 5**
2-Delimitation for suppression	JT[1]/MULTILURE[2]/OBDT[2]/TEPHRI[2]	TML/3C/PB	10 to 20**			
2-Delimitation for eradication	JT[1]/MULTILURE[2]/OBDT[2]/TEPHRI[2]	TML/3C/PB	20 to 30**			
3-Detection for exclusion/ containment	JT[1]/MULTILURE[2]/CC[2]	TML/3C/PB	1***	2***	2 to 4***	4-10***

[1]With TML for male captures
[2]With 3C mainly for female captures

From Appendix 5 of the IAEA trapping manual.

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Pest Free Areas

Trap Servicing Intervals

- Generally are operationally determined
- Dry traps should be checked every 10 to 14 days.
- Liquid baited traps every 7 days

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Pest Free Areas

Reports and Maps

Trapping results need to be compiled and reported in a timely way

A central location such as a website may be used.

It should be set up to generate the necessary reports.

Maps with all trap locations should be kept.

Typically each trapper has a trap logbook and reports the results in a timely way to a compiler (group).

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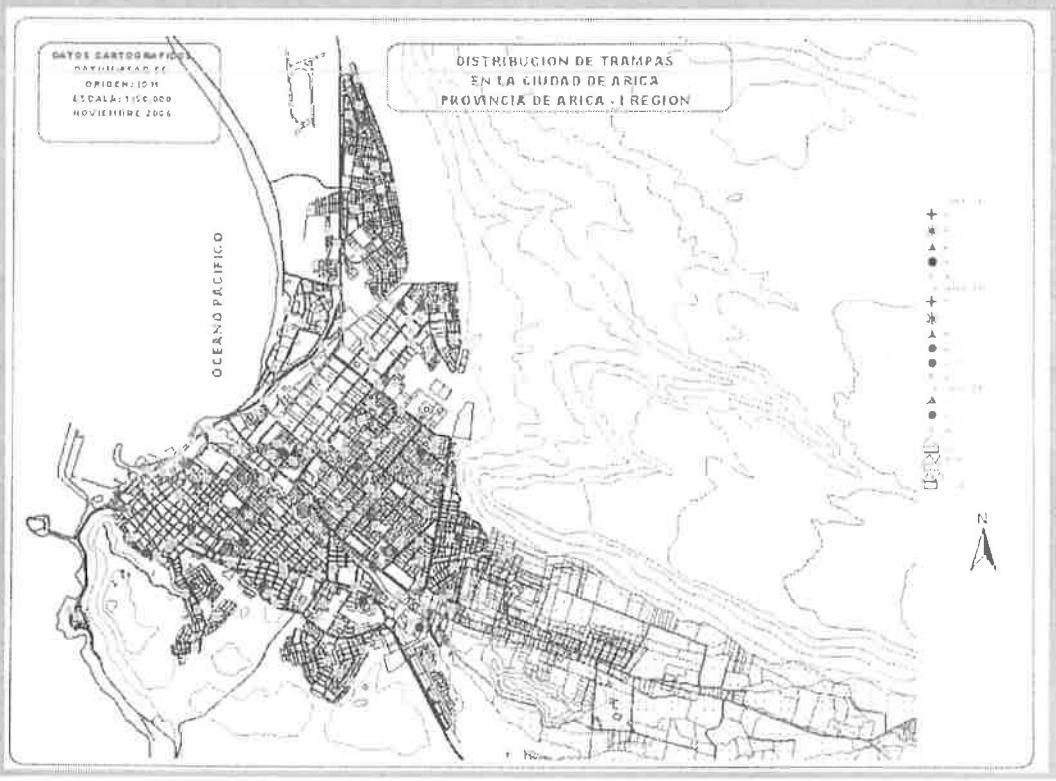
Pest Free Areas



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Pest Free Areas

Quality control (QC) protocols for surveillance:

a. verification of lure efficacy
b. placement and recovery of marked target flies
c. regular reviews of survey documentation
d. audits of trap placement and servicing
e. confirmation of identifier competency

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Elements of a Pest-free Area

- Quality Control Protocols

- Verification of lure efficacy
- Placement and recovery of marked target flies
- Regular reviews of survey documentation
- Audits of trap placement and servicing
- Confirmation of identifier competency

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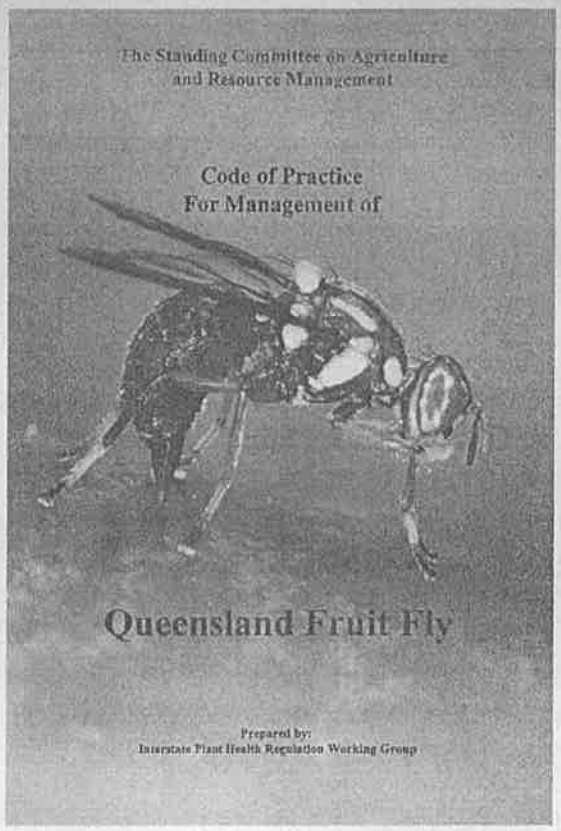

Pest Free Areas

Fruit fly trapping manual

Program manual

Quality Control manual

Action Plan

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Pest Free Areas

Fruit Fly Trapping Program (fruit fly manual) This trapping/training manual should cover all aspects of trapping and quality control including:

Who implements and manages QC? (For example, The National Plant Protection Organization, local Comite, growers?)
What are their qualifications, training? (For example, is there formal training or a manual?)
Identifiers (training, qualifications)
Trap baits - what flies are they trapping for, how often are traps checked, baits changed
Trap densities (ISPM, NAPPO standards)
Records of trapping
Emergency programs – what do they do when they find a fly?
SIT(Sterile Insect Technique)
Bait spray programs

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Pest Free Areas

4. Movement controls:

   a. sampling records

   b. identification of intercepted specimens

   c. verification of documents

   d. confirmation that required treatments occurred

   e. documentation of any other phytosanitary procedures

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Elements of a Pest-free Area

Movement Controls

Road stations, inspection checkpoints

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Pest Free Areas

This goes back to one of the three parts of a PFA according to ISPM 4 – the phytosanitary measures to maintain freedom

Are there laws to restrict the movement of host material?

Are there road stations available to enforce such laws?

Do they stop all host material from moving?

Under what conditions is commercial fruit moved, for example, with approved treatments, and if so, who supervises treatments?

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Pest Free Areas

Emergency Action Plan

a. trigger for plan implementation

b. delimiting survey

c. mitigation measures

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Elements of a Pest-free Area

Emergency Action Plan

- Trigger for plan implementation
- Delimiting survey
- Mitigation measures

Pest Free Areas

- Success stories - examples

- Fruit fly freedom for California - Many incursions of Medfly and *Bactrocera* species
- Fruit fly freedom for Texas
- Chile – Medfly and *Anastrepha* species.
- Argentina – Medfly – S. Mendoza and Patagonia
- Australia – Medfly and *B. tryoni* free areas

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Public Awareness and other Issues

Devaiah A. Muruvanda, Ph.D.
Senior Risk Manager – Entomology

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Public Awareness and other Issues

Public outreach and education crucial:

-Establishing pest freedom

-Maintaining pest freedom

-Notify public of pest freedom/eradication

-Notify host industry of pest freedom/eradication who must be key partner in the endeavor to establish/maintain PFA/FF-PFA

-It is for their benefits that governments strive to achieve/maintain PFA/FF-PFA

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Public Awareness and other Issues

Public Outreach

-Important to get support of public, especially local community close to PFA

-Individuals that travel to or through the area

-parties with direct and indirect interests

-Use different media-written, radio, TV to inform about establishing/maintaining PFA and avoid the introduction/reintroduction of potentially infested host material

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Public Awareness and other Issues

Public outreach and Awareness

- to be continuous/ongoing, providing information on:
- Permanent or random checkpoints
- Posting signs at entry points and transit corridors

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Public Awareness and other Issues

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Public Awareness and other Issues

Public outreach and Awareness-contd.

-Disposal bins for host material

-Leaflets/brochures with pest information and the pest free area

-systems to regulate fruit movement

-publications-print, electronic media

-non-commercial hosts

-Security of the traps

Penalties for non-compliance, where applicable

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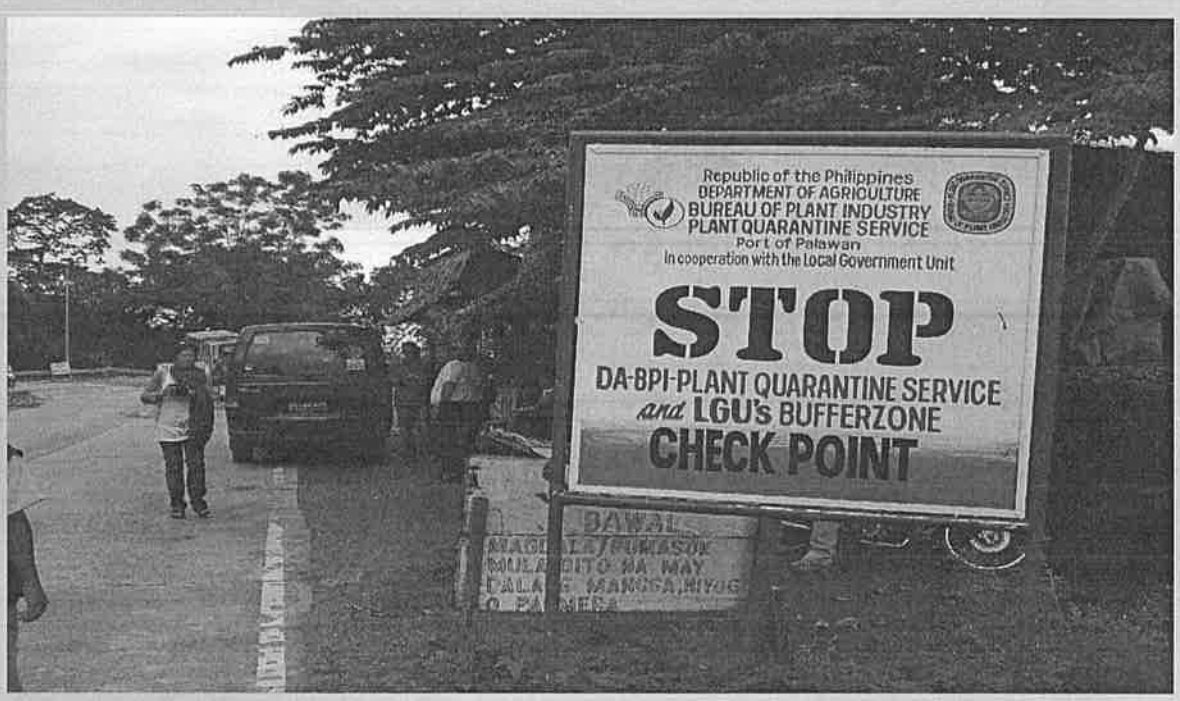
Public Awareness and other Issues



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Public Awareness and other Issues

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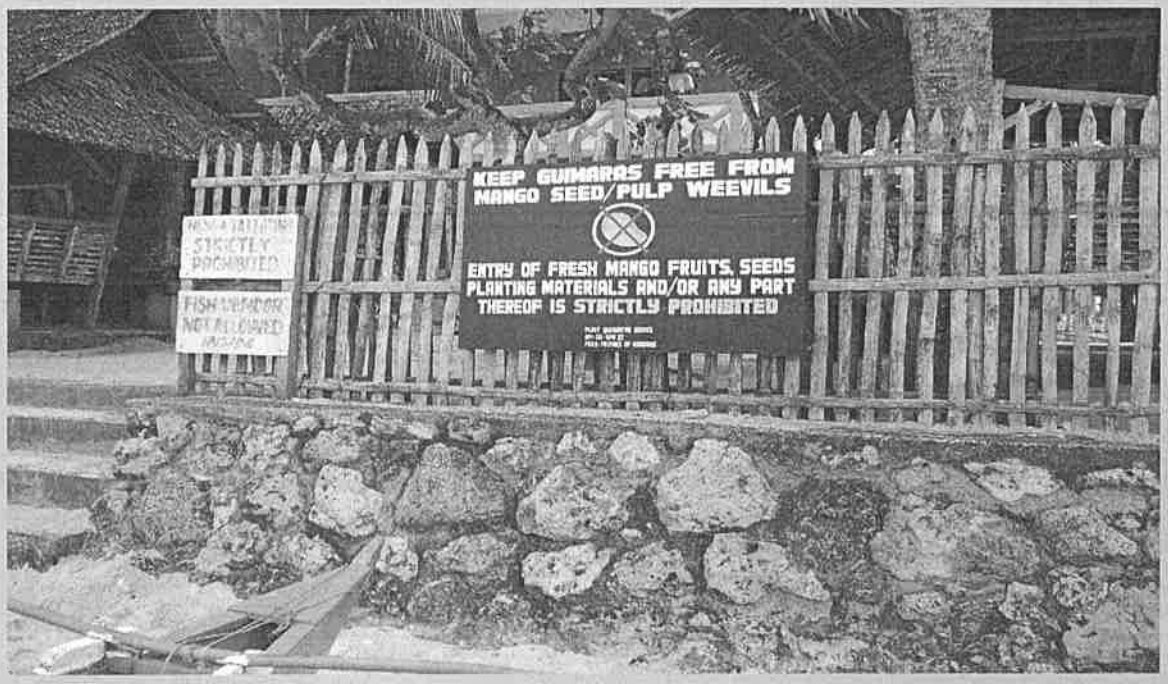
Public Awareness and other Issues



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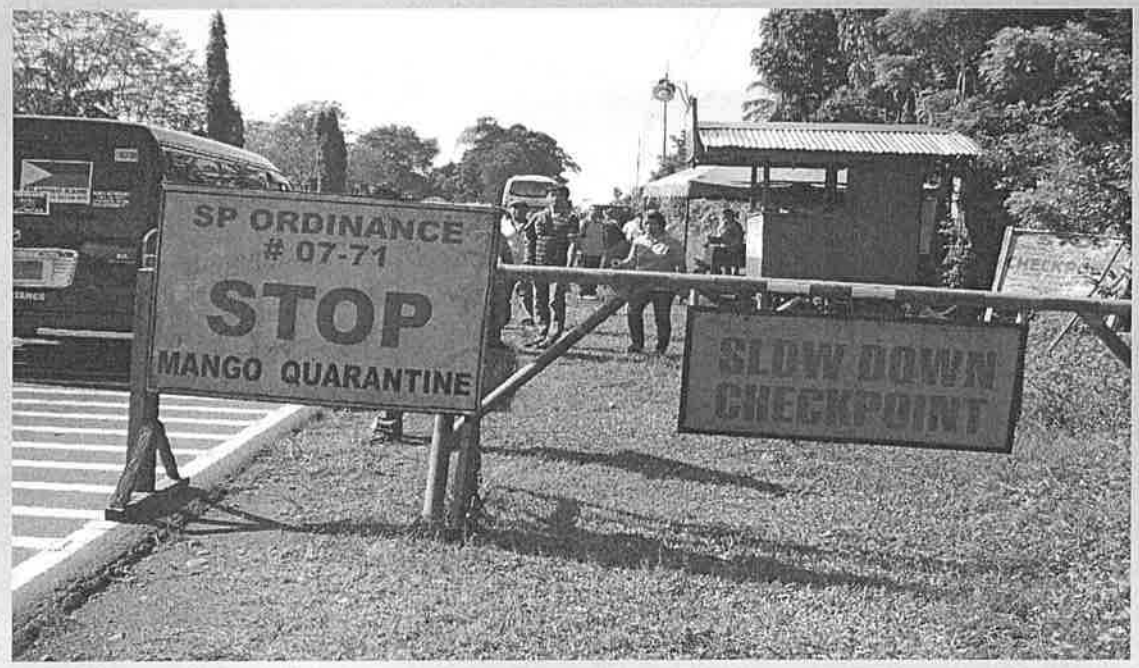
Public Awareness and other Issues



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Public Awareness and other Issues

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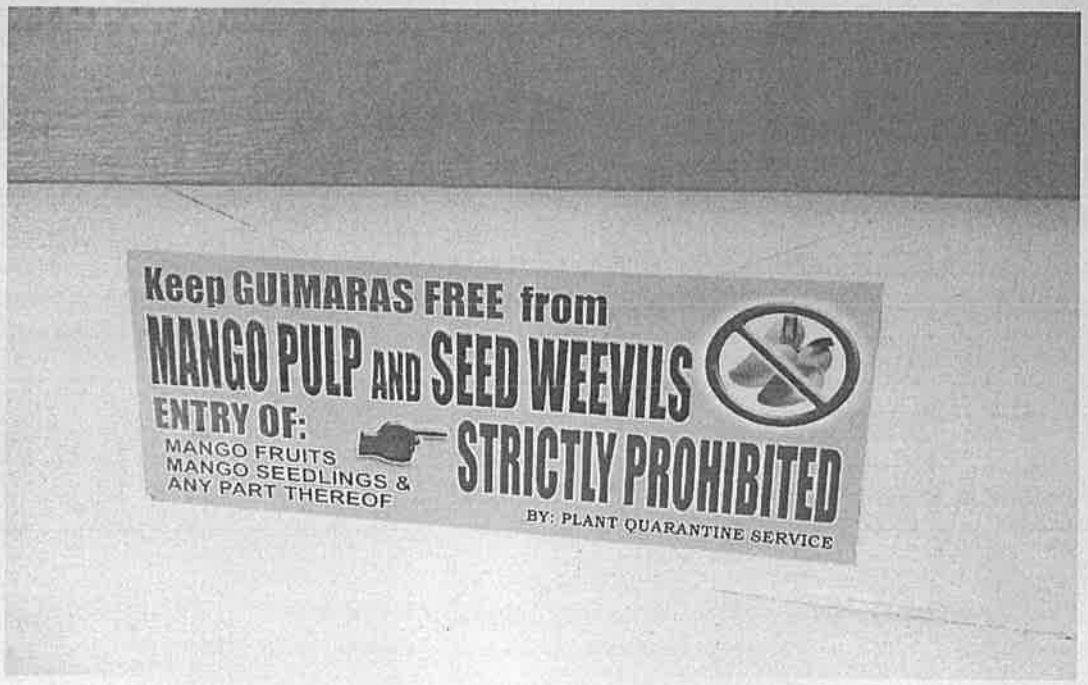
Public Awareness and other Issues



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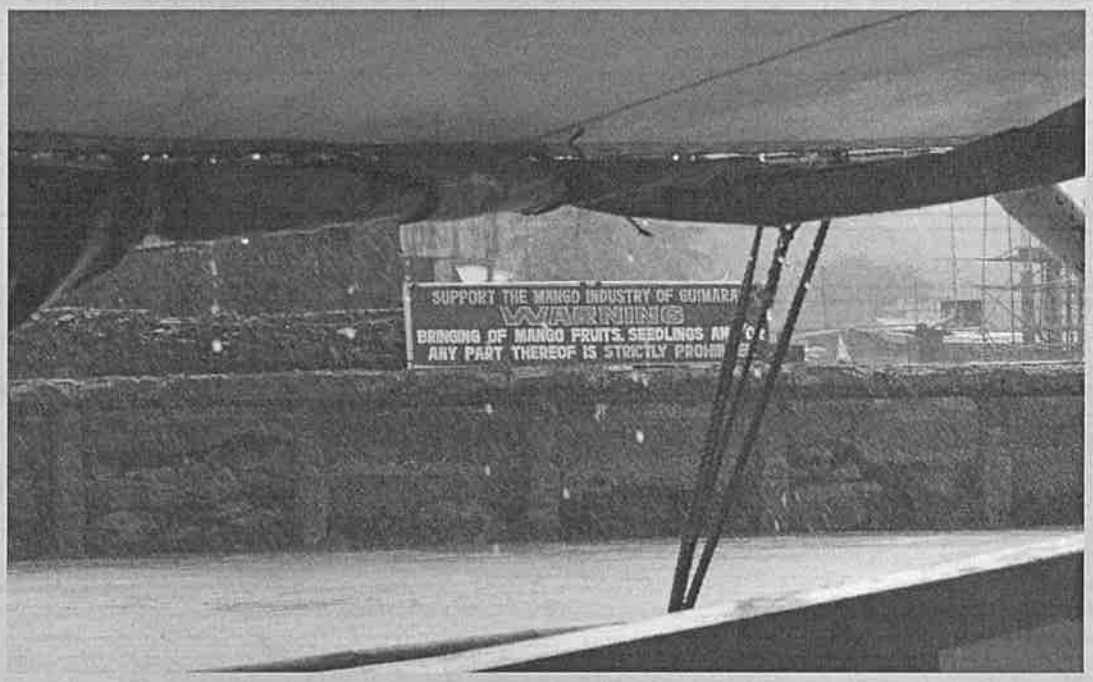
Public Awareness and other Issues



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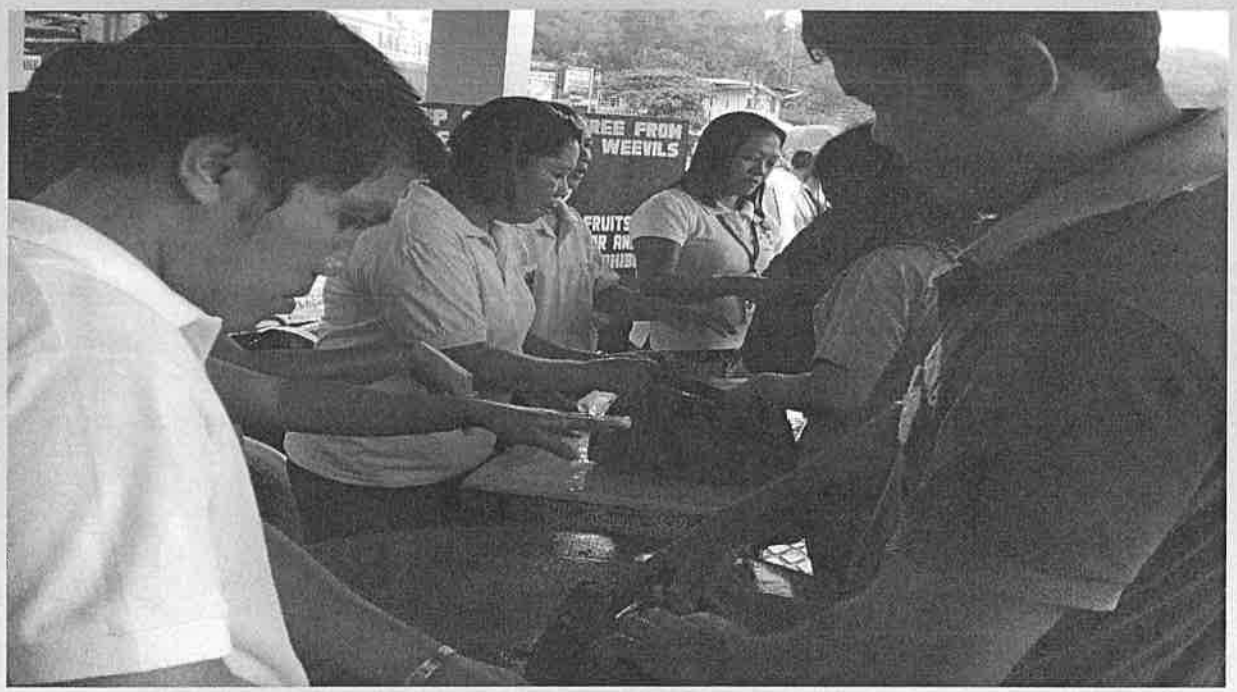
Public Awareness and other Issues



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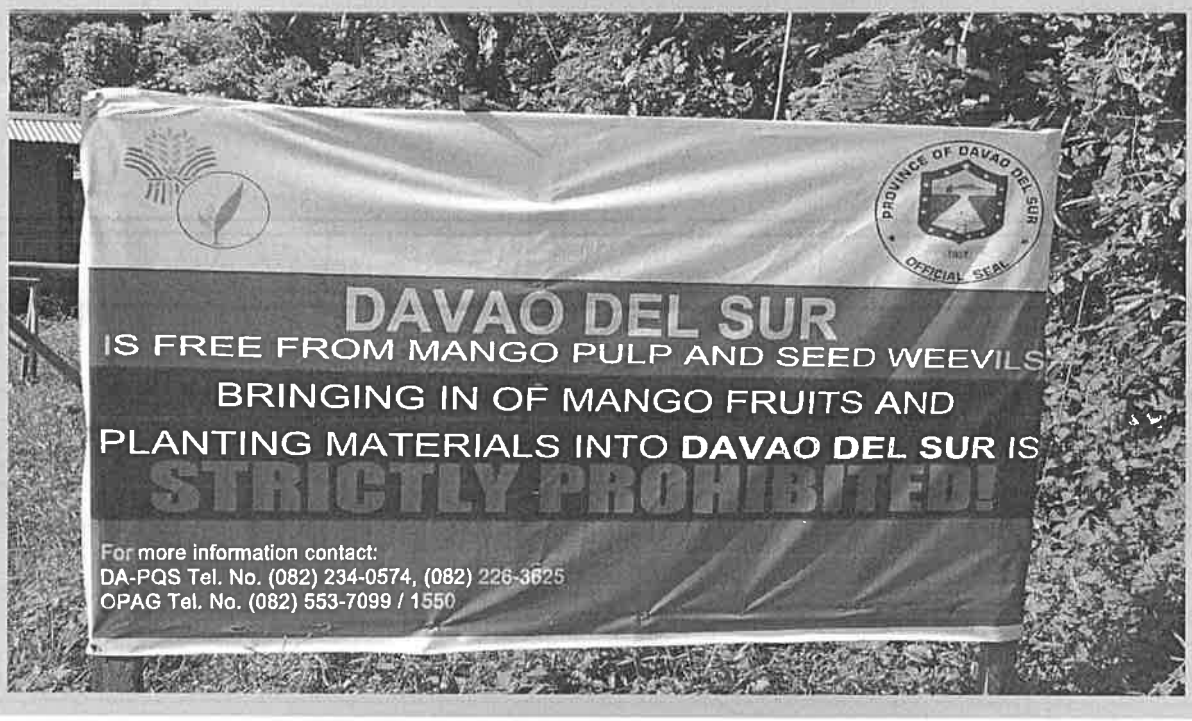
Public Awareness and other Issues



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Elements of a Pest-free Area

- Movement Controls
- Road stations, inspection checkpoints

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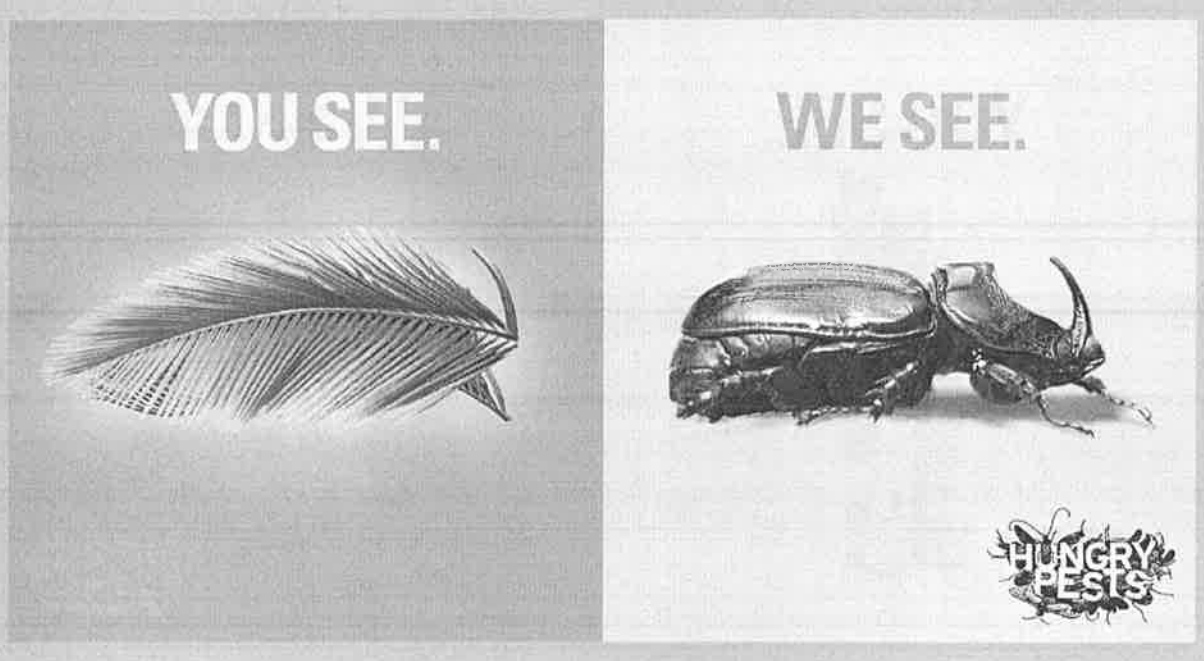
Public Awareness and other Issues



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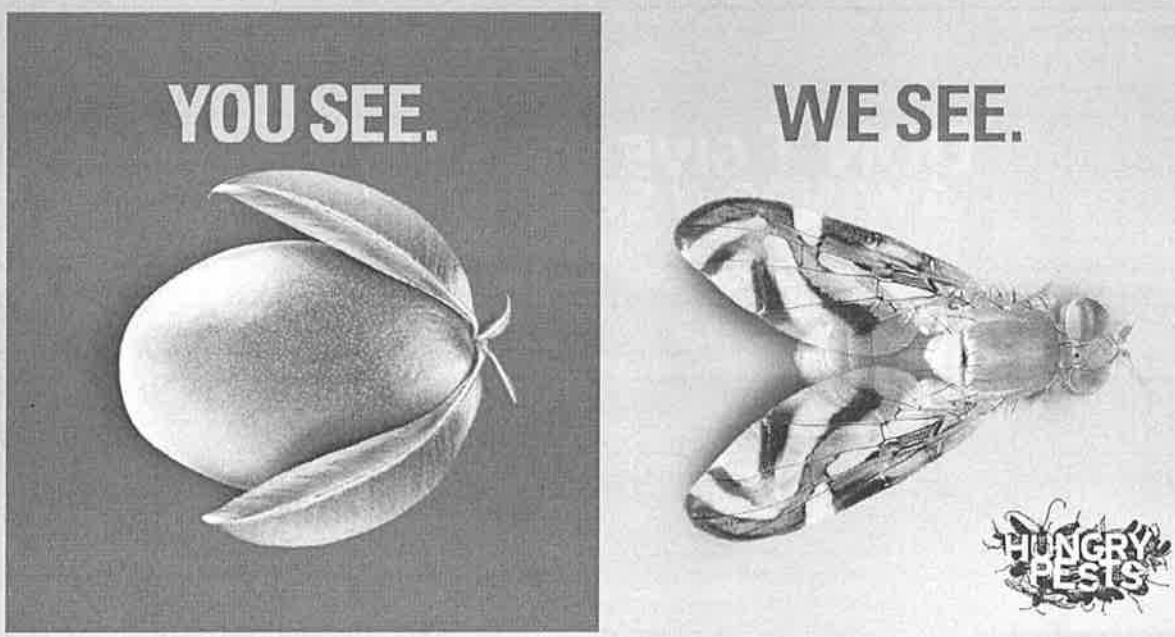
Public Awareness and other Issues



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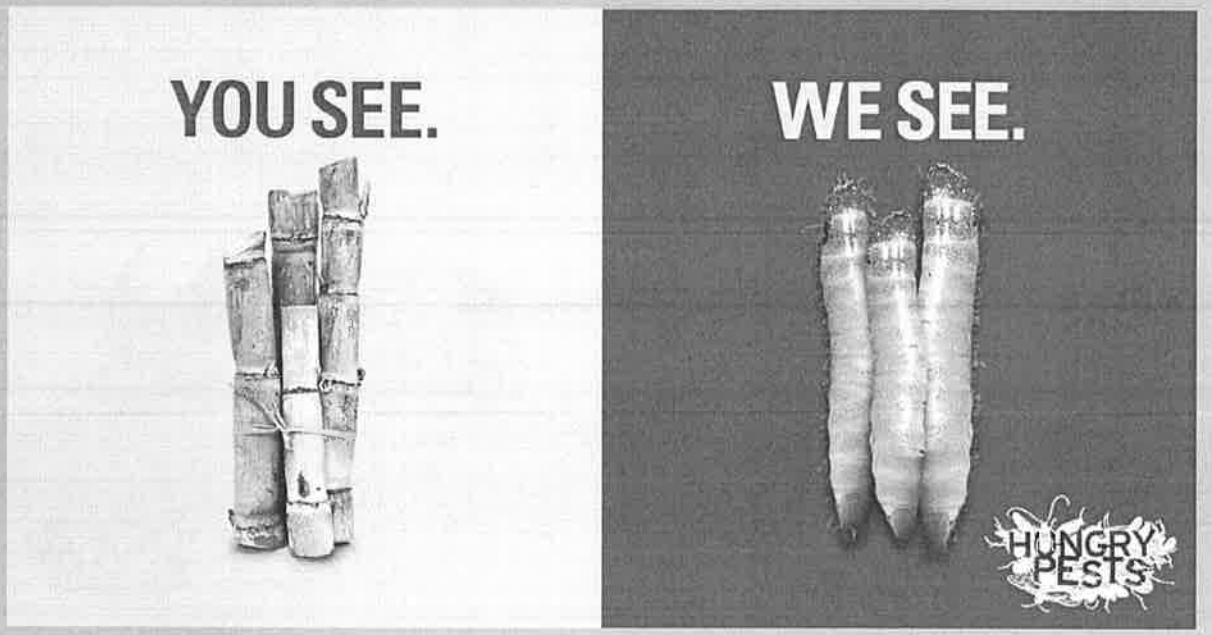
Public Awareness and other Issues



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Public Awareness and other Issues

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Public Awareness and other Issues

Non-Compliance Issues

-Usually done through Notifications

-Notification is normally bilateral

-Most cases for detection of regulated pests in imported consignments

-other significant instances of non-compliance

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Public Awareness and other Issues

Non-Compliance Issues

Significant instances of non-compliance:

-failure to comply with phytosanitary requirements

-detection of regulated pests

-failure to comply with documentary import requirements as absence of phytosanitary certificates; uncertified erasures or alterations to PCs; serious deficiencies in information on PCs; fraudulent PCs

-prohibited consignments or extraneous materials in consignments

-evidence of failure of specified treatments

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Public Awareness and other Issues

APHIS and non-compliance

-Non-compliance issues addressed in OWP when market access given for commodity

-EAN in cases of interceptions as Fruit Fly

-Repeated interceptions-Notification sent to country and penalty imposed

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Public Awareness and other Issues

- DHS (CBP) inspects all consignments at Port of Entry
- No distinction made on source
- APHIS can request enhanced sampling and or fruit cutting to reduce risk

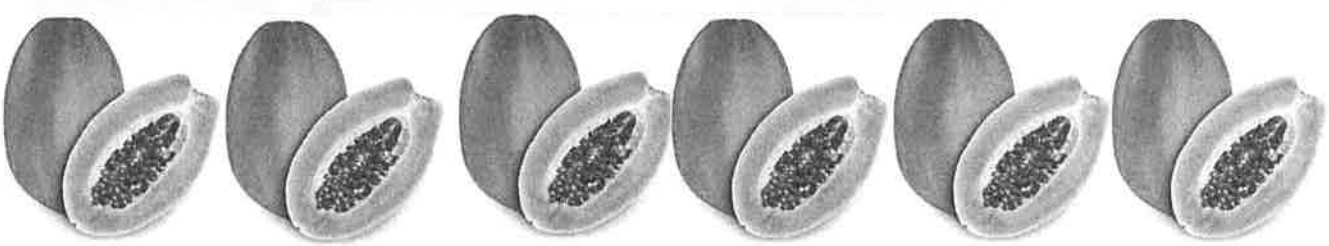
MANAGING FRUIT FLIES STATUS IN MANGO ORCHARDS IN INDONESIA: Indonesian Experience

Cahyaniati and Anik Kustaryati

Regional ASEAN Training Workshop on the Establishment of Pest Status:Enhancing the Effectiveness of Phytosanitary Measures, ARIAQ, Bekasi, Indonesia

Introduction

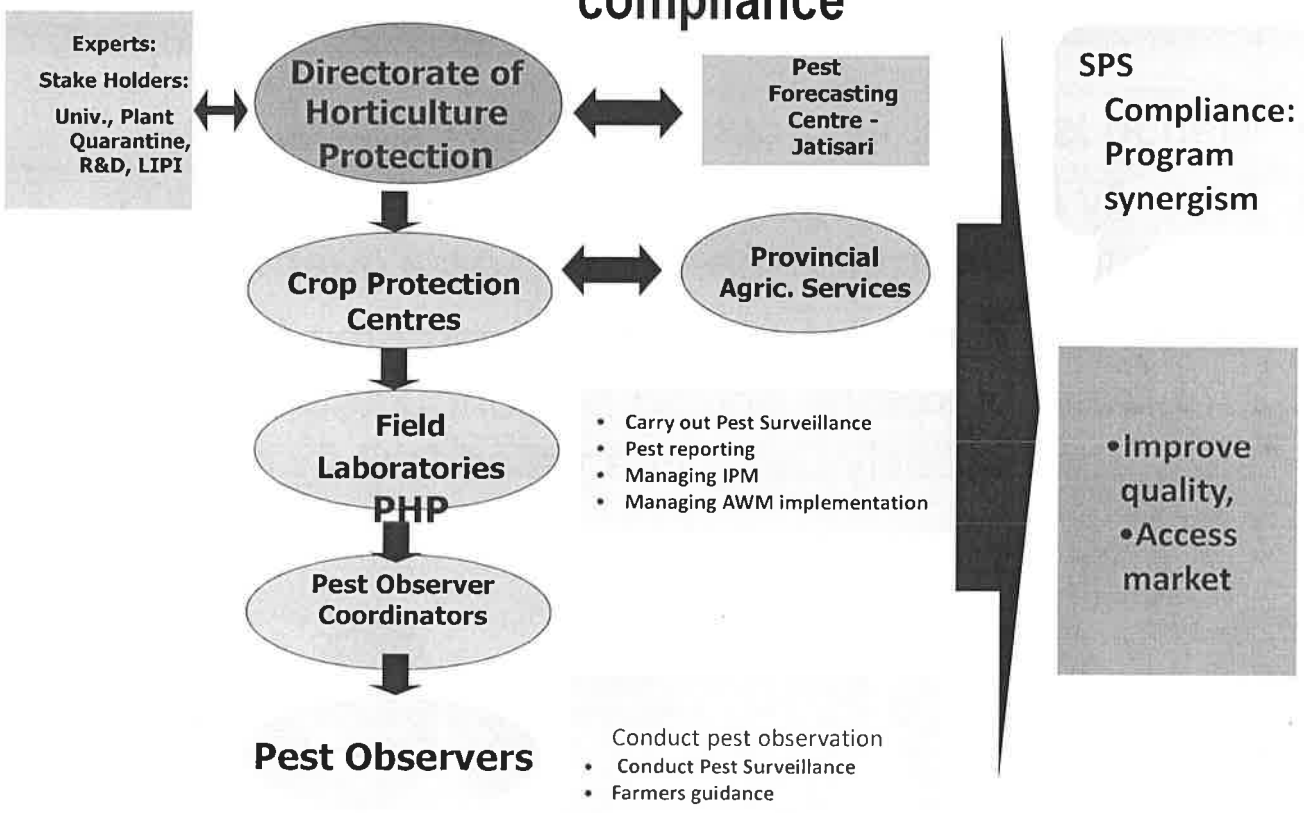
- Mango is an exotic tropical fruit for export
- Fruit fly is a major pest of mango that causes 40 to 100% loss of production. Its also as a quarantine pest
- Sporadic control not efective to overcome fruitfly problems, therefore, should be conducted in a wide area, continuously using integrated fruit fly control management.



Related ISPM we want to achieve

- ISPM No. 6: Guidelines for surveillance
- ISPM No. 10: Requirements for the establishment of pest free places of production and pest free production sites (PFPS)
- ISPM No. 14: The use of integrated measures in a systems approach for pest risk management
- ISPM No. 30 : Establishment of ALPP for Fruit Flies (Tephritidae)

Crop Protection Institutions to support SPS compliance

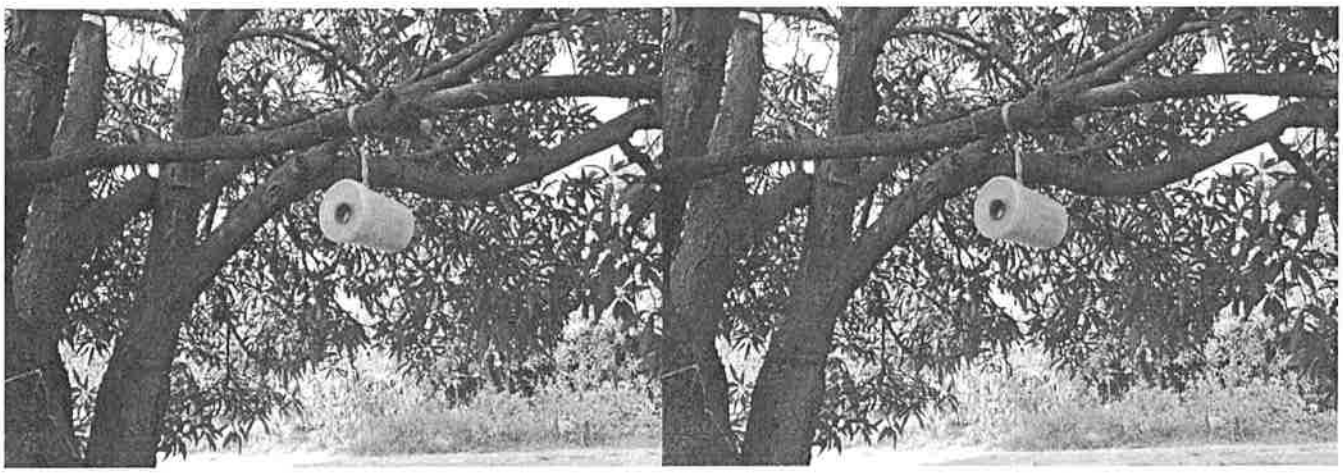


ACTIVITIES

- Initiated in 2009.
- Set up guidelines for achieving SPS compliance: 2009-2010
- Sosialisation of synergism program and activities with stakeholders
- Conduct workshops:
  - ❑ Surveillance for Pest List
  - ❑ Set up Data Base of Pest List
  - ❑ Pest Risk Management
- Produce surveillance guidance
- Conduct Pest Surveillance
- Produce ALPP/AWM guidance
- Area wide management (AWM) public awareness.
- Prepare draft of Minister Decree for Pest Surveillance

Pest Surveillances

- ❑ **17 Field Pest Laboratories**
- ❑ **Province: North Sumatera, West Sumatera, Riau, Lampung, West Java, Central Java, Yogyakarta, East Java, Bali, West Nusa Tenggara, West Kalimantan, East Kalimantan, South Kalimantan, South Sulawesi, North Sulawesi.**



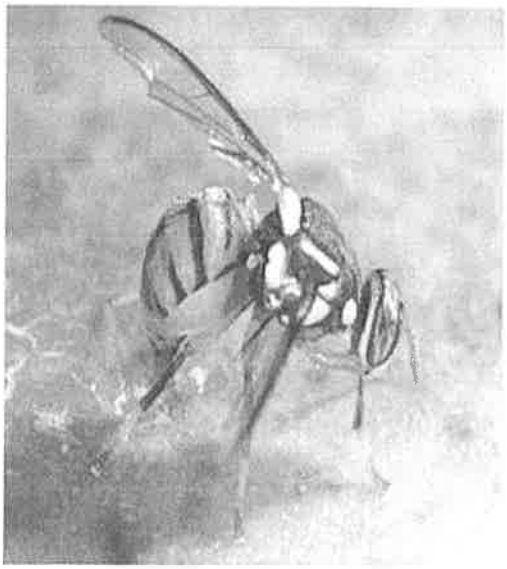
AREA-WIDE MANAGEMENT IMPLEMENTATION OF FRUIT FLY IN INDRAMAYU: 2011-2015

Directorate of Horticulture Protection – ACIAR

Australian Government
Australian Centre for International Agricultural Research

DIREKTORAT JENDERAL HORTIKULTURA
DEPARTEMEN PERTANIAN

Area-wide management of pest fruit flies in an Indonesian mango production system



Stefano De Faveri

Anik Kustaryati

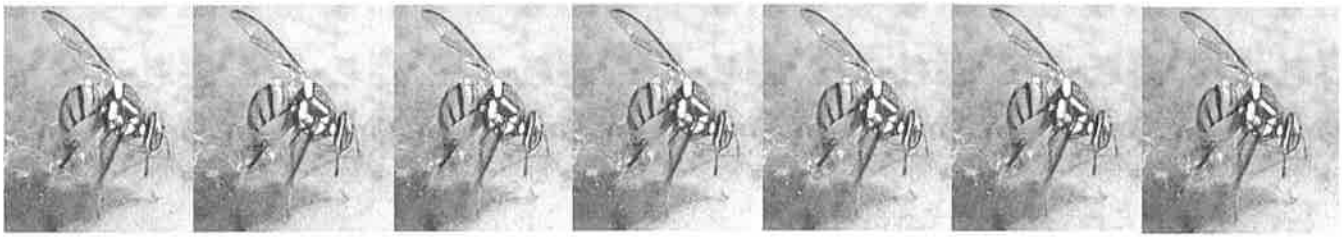
Dr S. Vijaysegaran Cahyaniati

Dr H. Fay

Dwi Iswari

Soesilo

DHP Jakarta, Field Laboratory Indramayu



Why Area-Wide Management (AWM)?

Principles of Fruit Fly AWM

Fruit fly management

- **Systems approach (multiple treatments) at farm level, at larger scale (Village)**
  - **Monitoring**
  - **Male annihilation**
  - **Protein baiting**
  - **Hygiene**
    - **All treatments must be applied regularly**
    - **Require large area to be effective**
    - **Less dangerous to applicator**
    - **Not harmful to beneficial insects**
    - **No residues remain in fruit**
    - **Consumer preference for pesticide free**
    - **Safer for environment**

Principles of Fruit Fly AWM

Fruit fly management

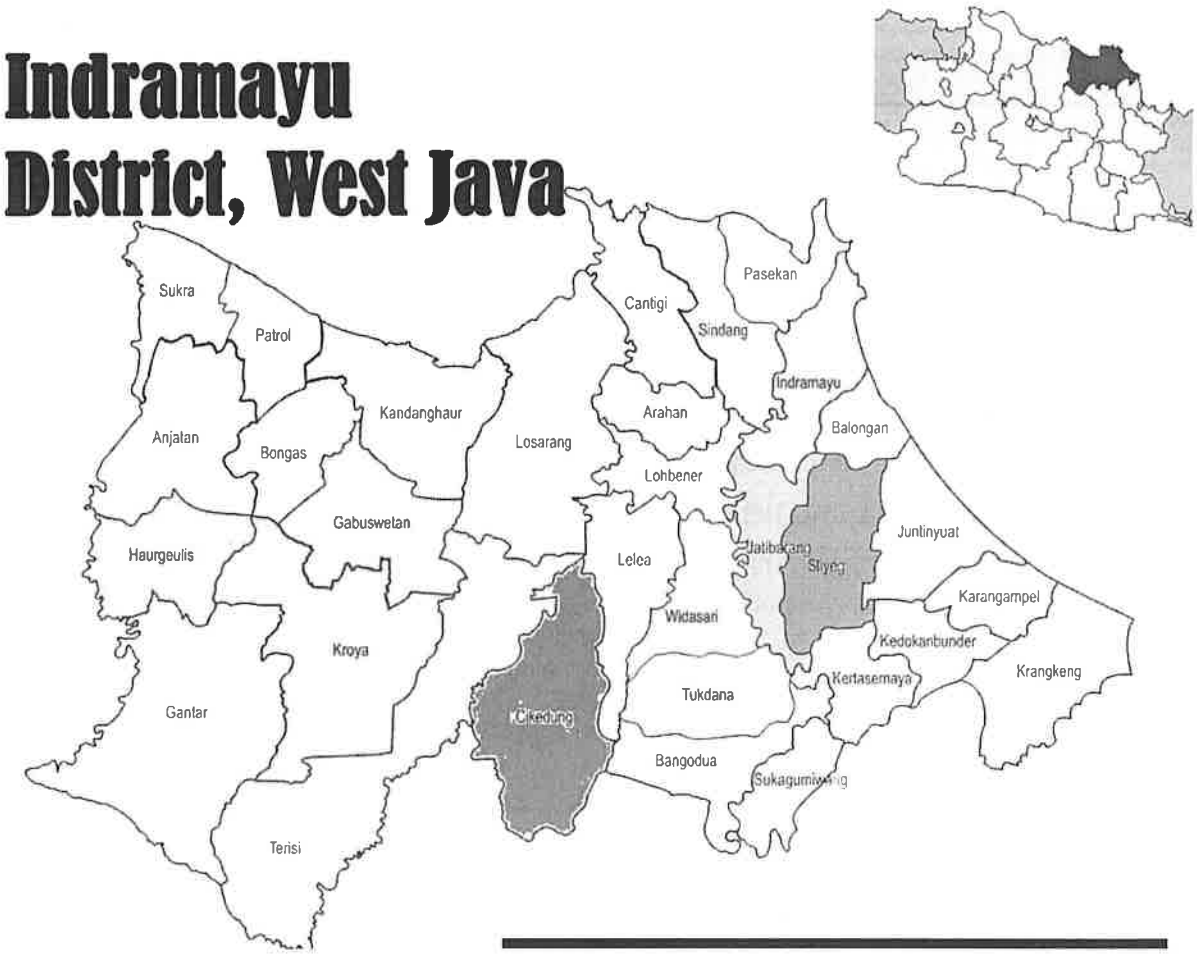
- Conventional control
  - Insecticide cover sprays
    - Must spray regularly
    - Spray coverage must be good
    - Dangerous to applicator
    - Kills beneficial insects
    - Residues remain in fruit
    - Consumer preference for pesticide free

District of Indramayu: AWM site

Location of AWM
(District of Indramayu, West Java Province)

No.	Locations	Mango area (Ha)	Description
1.	Krasak,	40	Treated
2.	Sliyeg Lor	60	Treated
3.	Cikedung	30	untreated control

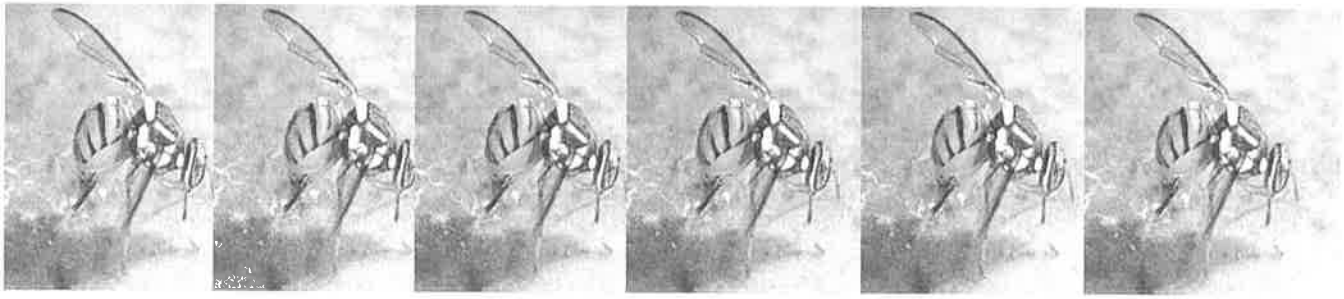
Mango Variety : Gedong
Fruit fly species: *Bactrocera dorsalis.*



Mango Orchard

Technology in AWM Implementation

1. Mapping (location/transect, position of ME wooden block, and trapping)
2. MAT (Male Annihilation Techniques) with ME Block
3. Protein bait application;
4. Fruit collection and rearing
5. Sanitation (field hygiene)
6. Trapping observation of fruitfly population



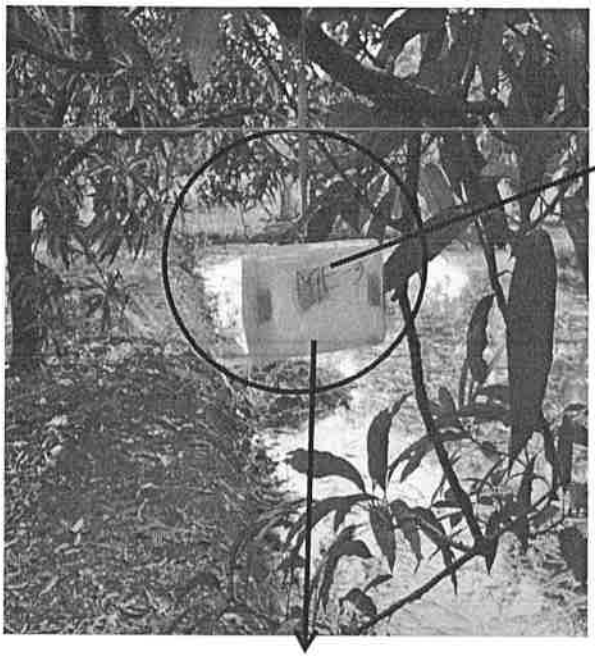
Activities of AWM

No.	Activities	
1.	Coordination meetings (ACIAR, government, farmers group)	4 times a year
2.	Mapping	-Trapping observations in treated location -Methyl eugenol (ME) mounting block at treatment site
3.	ME block preparation	- Application of ME block technology
4.	Training of trainers, socialization of ME block method	- Involve farmers, pest observers, and extension workers in the locations

AWM Activities (2)

No.	Activities	
5.	ME Block replacement	Every 2 months
6.	Observation of trapping results (weekly)	Counting the number of fruit flies and population dynamics, then make the graph
7.	Protein bait application (weekly)	*spot spray* begins at the fruit set until harvest
8.	Sanitation of infected fruit	Culling of infected fruit
9.	Observation of fruit damage	Observe and rearing of the affected fruit
10.	Farmer Field Day	Involve all farmers, stake holders and ACIAR

Fruit Flies Trap



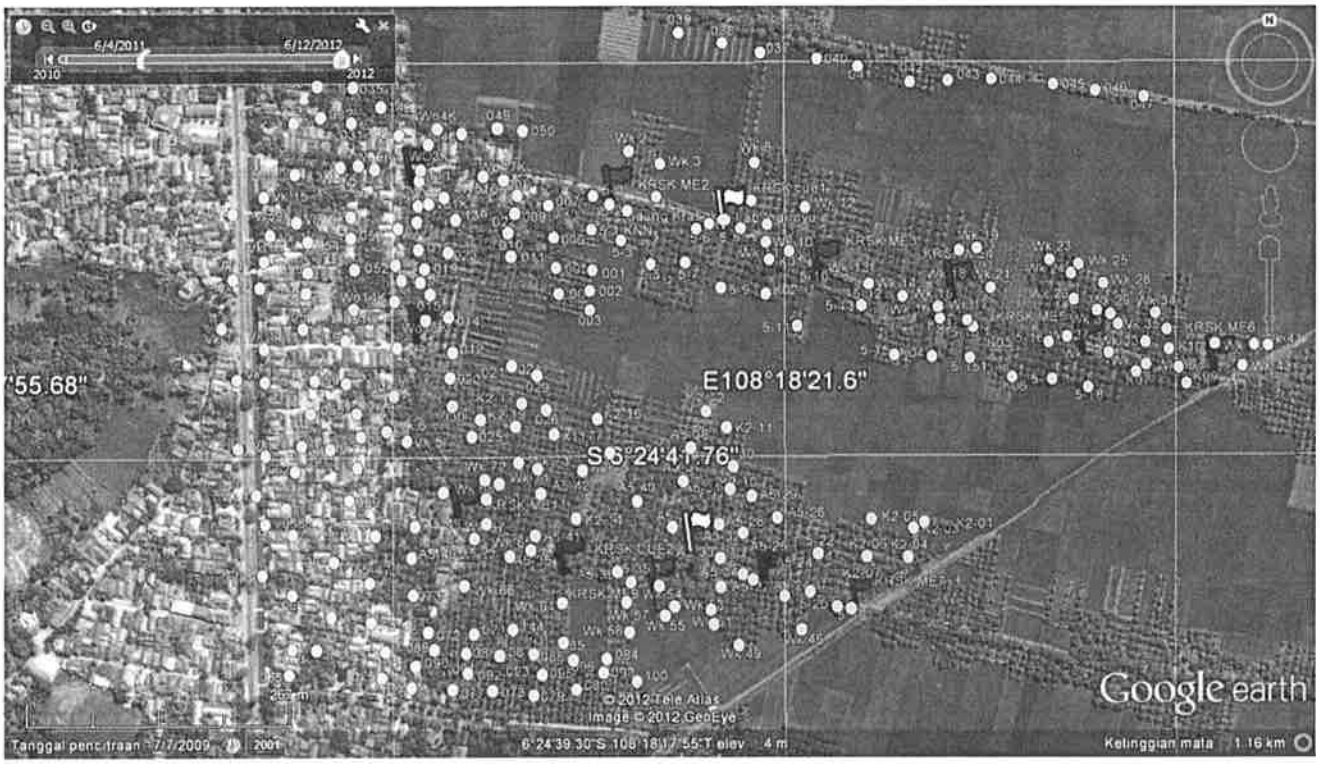
Steiner trap contains a mixture of cotton with ME and insecticide fipronil (4 ml ME: 1 ml insecticide

Number of observation traps: 6-10 traps/ha.

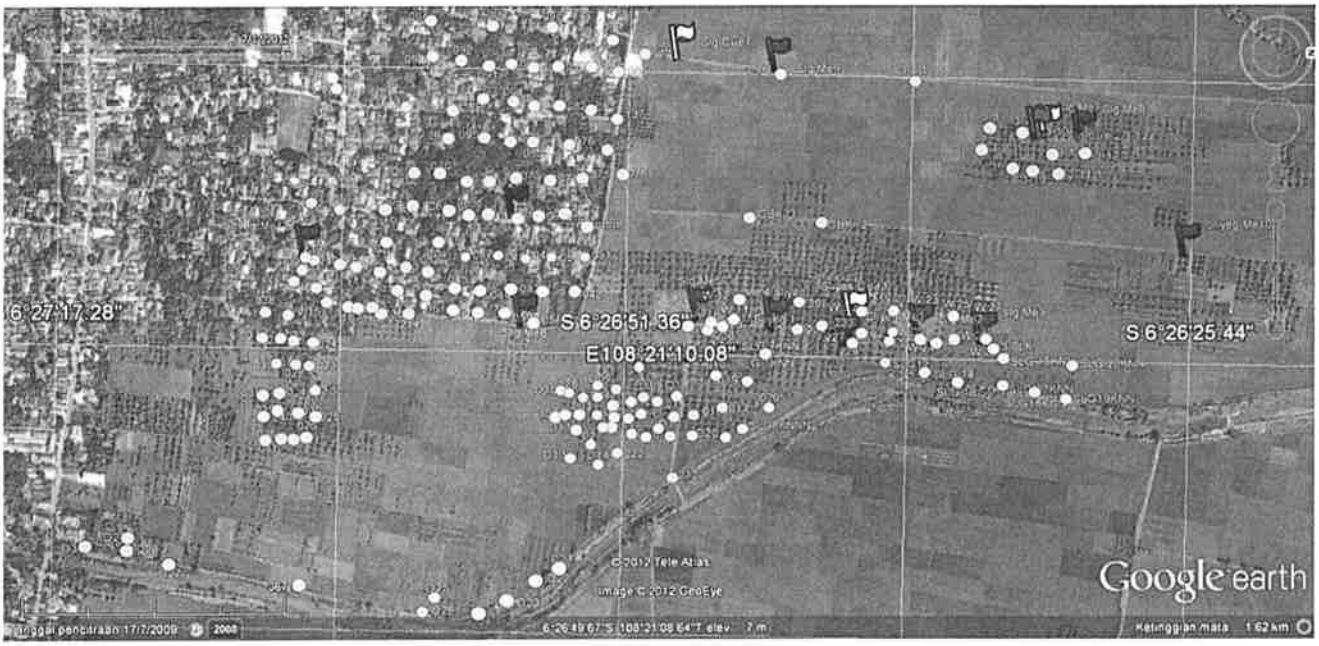
Traps setting ± 1.5 m height from ground level

Fruit flies trapping activities

Mapping ME block & Traps in Krasak



Mapping ME block & Traps in Sliyeg Lor



Treatments

Application of ME block on tree trunk

- ME block is hang on to the mango tree
- Height about 1.5-2 m above the ground level.
- Every 2 months the new ME block is added on the same tree or in adjacent of the prior tree.
- Distance between mango trees is 50 m or every 5 trees is put one ME block

ME blocks hang on the tree

Protein Bait (PB)

Protein bait is used to control male and female fruit flies

- Protein bait is applied mix with a little amount of insecticide (9.5 lt of PB mix with 50 ml of insecticide (Malathion) diluted in 9 lt of water. In one (1) ha of mango trees need 10 lt of mixture.
- Spot spray (3-4 sides of spot spray in one mango tree). Each side of spray needs 25 ml of protein bait.
- To ensure the precise volume of each spot spray, calibration of spray volume is needed before application.
- The application of PB is done regularly every week, from the beginning of fruiting until harvesting period.

Protein Bait Application

Spraying calibration

Measure the amount of fluid in a single spray

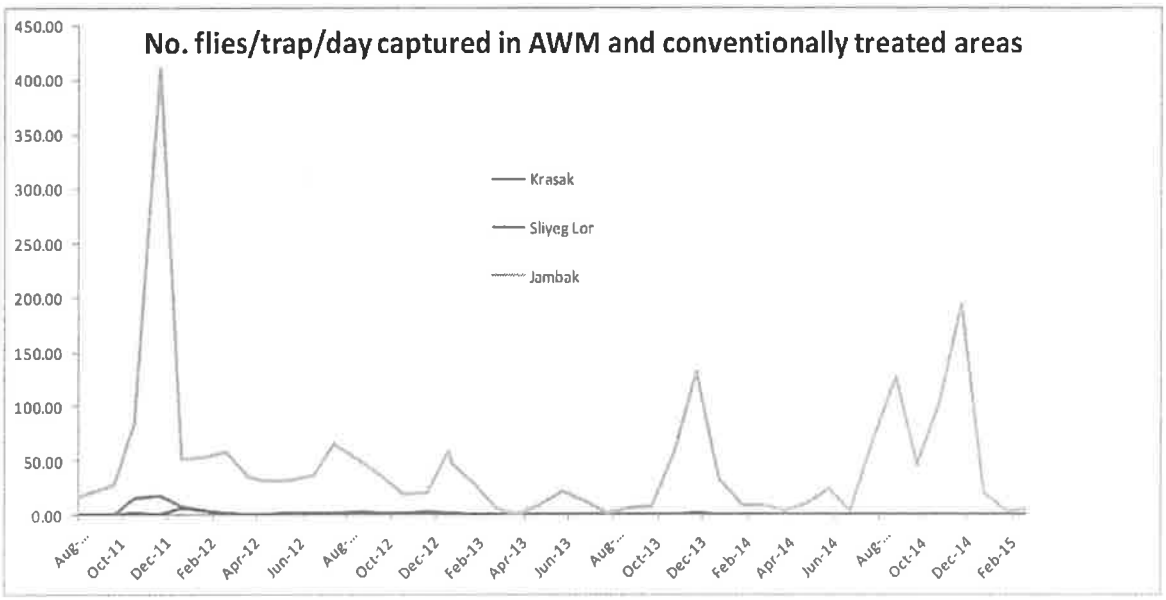
Spraying protein bait

± 20 ml fluid sprayed on 1 tree. Spraying is done in three parts of the tree (spray on the underside of leaves)

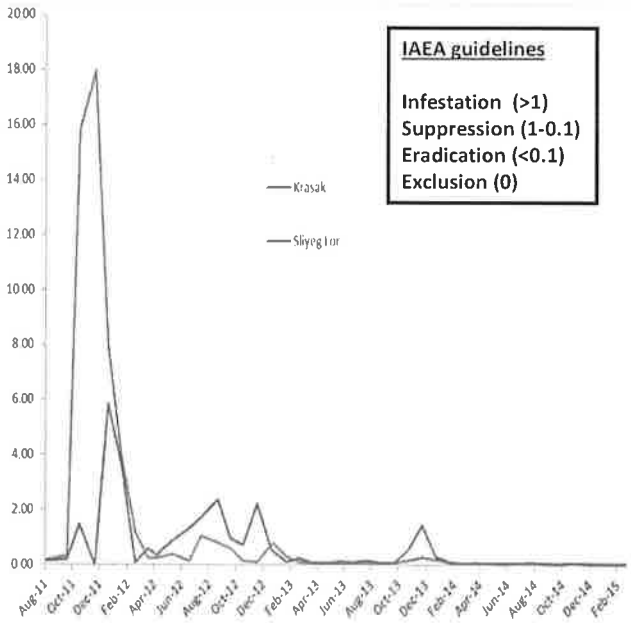
Socialization of protein bait to the farmers

Farmer Group at Krasak

Mean No. flies/trap/day in AWM and conventionally treated areas

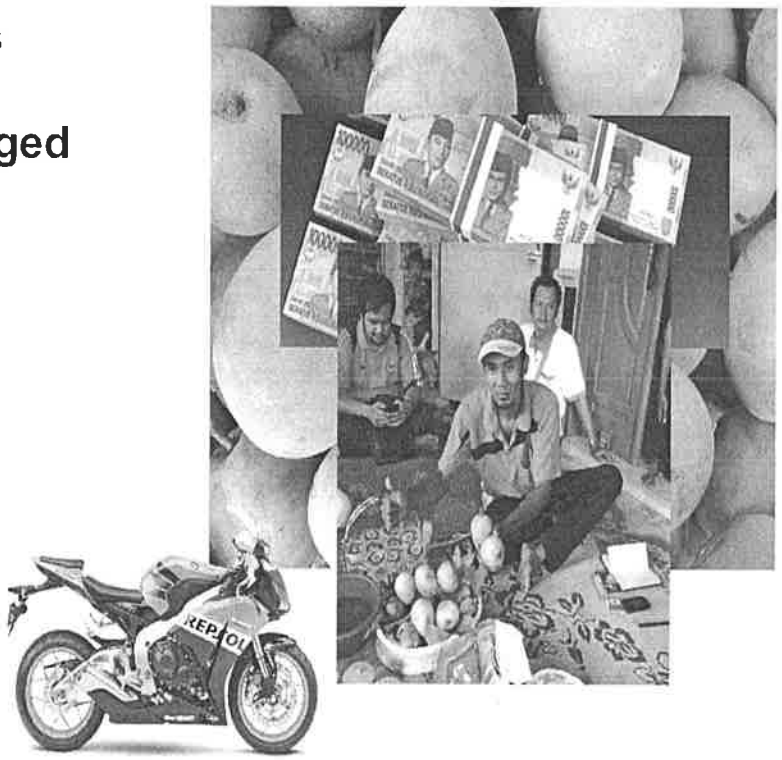


Mean No. flies caught per trap per day in AWM treated areas



Outcome

1. Very few fruit flies
2. Virtually no damaged fruit
3. Higher yields
4. More Profit
5. Happy farmers
6. New toys



Socio Economic Benefits

2016

Conducted by
Wahida, PhD and Dr. Rita Nur Suhaeti
ICASEPS

Household Survey

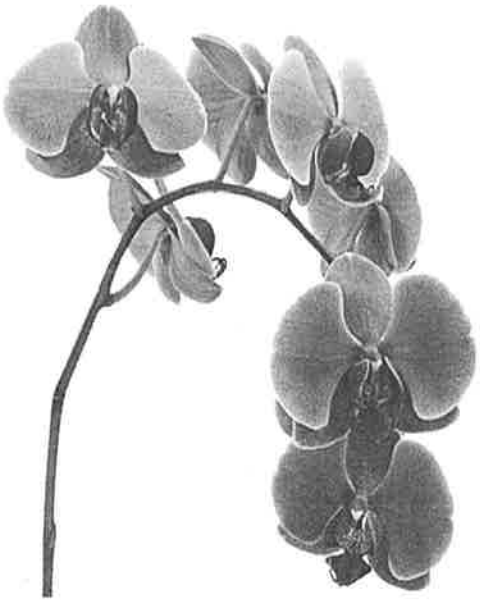
Sample selection: simple random sampling
Questionnaire : 14 – pages structured-questionnaires
No. of enumerator: 2 trained enumerators
Location:
1. Jambak, Cikedung (n=5)
2. Jatisura, Cikedung (n=6)
3. Sliyeg Lor, Sliyeg (n=10)
4. Krasak, Jatibarang (n=10)

Data collection: 19 – 25 April 2016

Real Yield Increases (kg/tree)

Village	Before AWM	After AWM	Now	Diff (%)
Sliyeg Lor	43.12	70.28		62.9
Krasak	32.42	125.28		286.4
Jambak			98.69[a]	
Jatisura			92.56[a]	

Note: [a] there are 1-4 farmers in both villages who have old mango trees with production between 600 – 1000 kg mangoes per tree



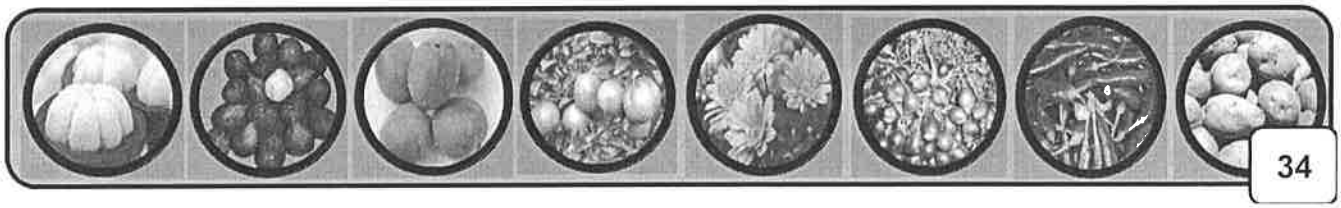
Terima Kasih

HORTICULTURE PROTECTION IN INDONESIA

DIRECTORATE OF HORTICULTURE PROTECTION
DIRECTORATE GENERAL OF HORTICULTURE
MINISTRY OF AGRICULTURE
JAKARTA, 2017

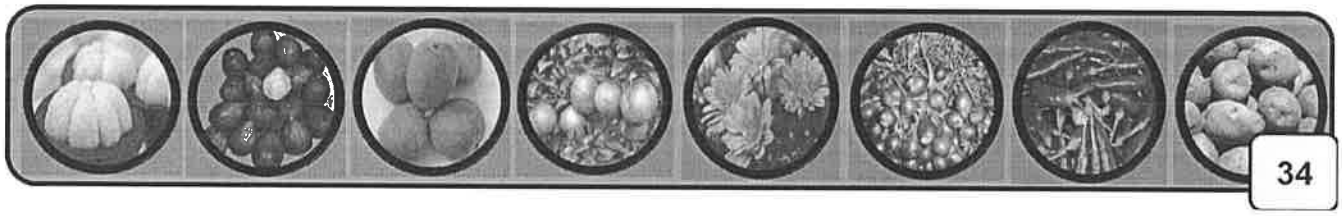
BACKGROUND

- The Impact of Climate Change
- Pesticide Residue Impact
- Impact of APEC in 2015, 2020
- Lifestyle
- Supply products that are still lacking



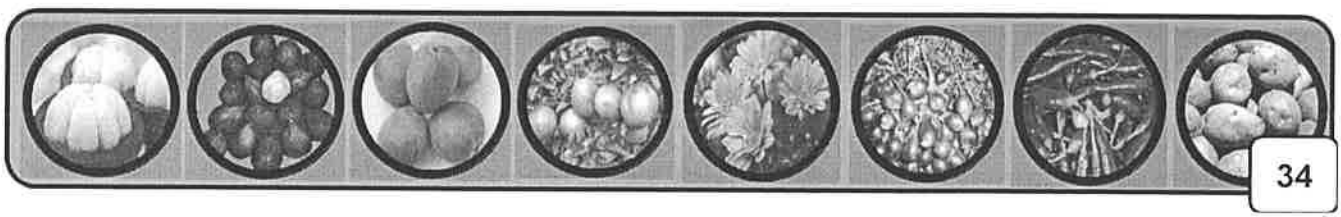
TARGET

- Safe from pest attack
- Environmentally friendly
- Horticultural regions should be low pest attack
- Development of Post Service of Biological Agent and Clinic of Pest Control



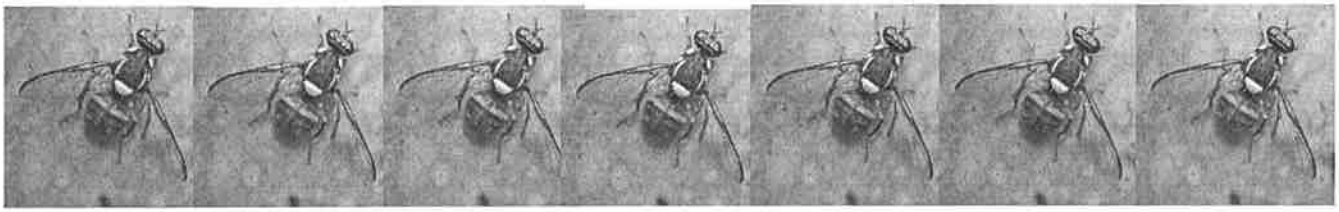
PURPOSE

- To secure the production from pest with in integrated, massal, simultaneous, sustainable
- Socializing the control of pests with environmentally friendly
- Preparing regions of horticultural environmentally friendly (ALPP, PFPS, PFA)



POLICY OF PLANT PROTECTION BASED ON

1. Law No. 12 year 1992 on Plant Cultivation System; that the implementation of Pest control based on Integrated Pest Management (IPM) system (Article 20 paragraph 1):
2. Government Regulation No. 6 year 1995 on Plant Protection,
3. Minister of Agriculture Decree no. 887 / Kpts / OT.210 / 9/1997 on Guidelines for Pest Control
4. Law No.13 year 2010 on Horticulture; that Pest Control with Environmentally Friendly (Article 32 point d).



LOW 12/1992 – IPM SYSTEM

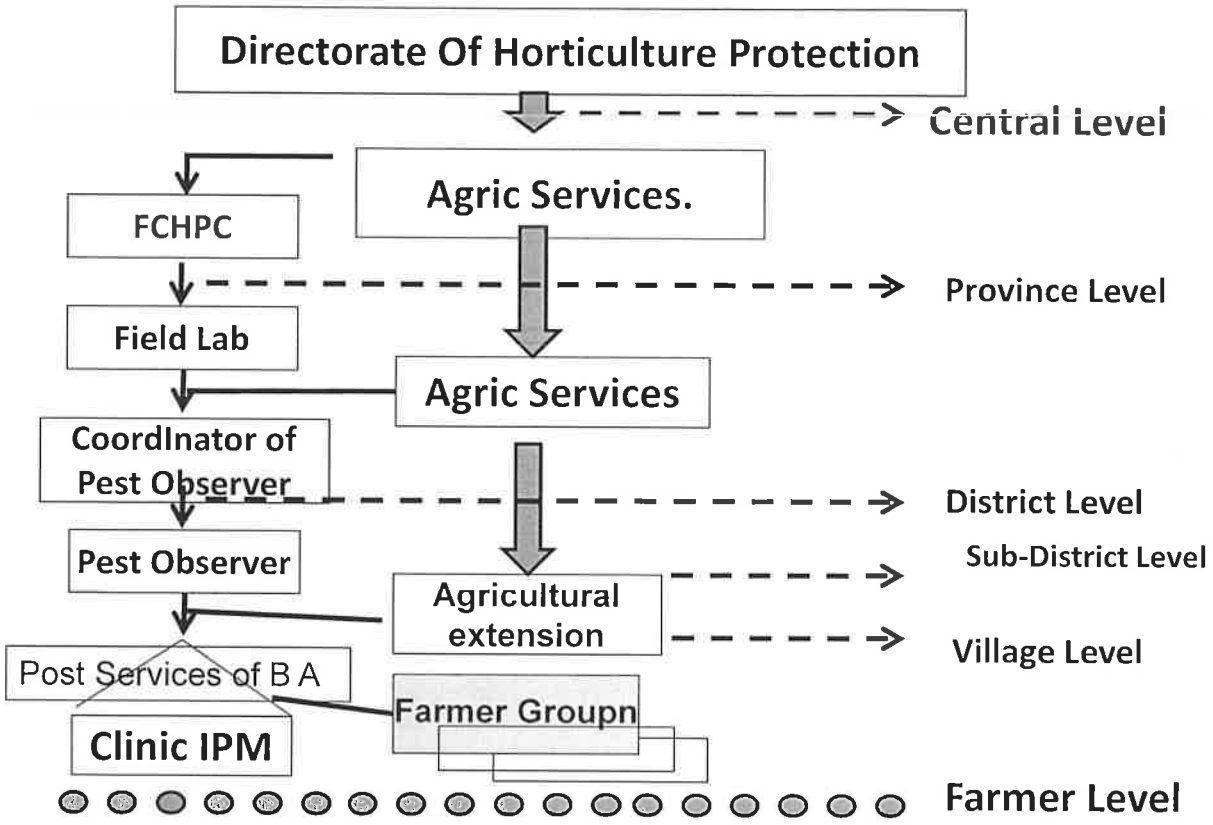
IPM Concepts

- Farmers as experts
- Learn from experience
- Pest control through healthy plant cultivation, mechanical, physical, biological, the last by chemical pesticide
- Observation of agro-ecosystem (plant, pest, natural enemy)
- Methods of adult education through Farmer Field School
- - 1 cycle of planting period
- - consists of TOT officers, FFS

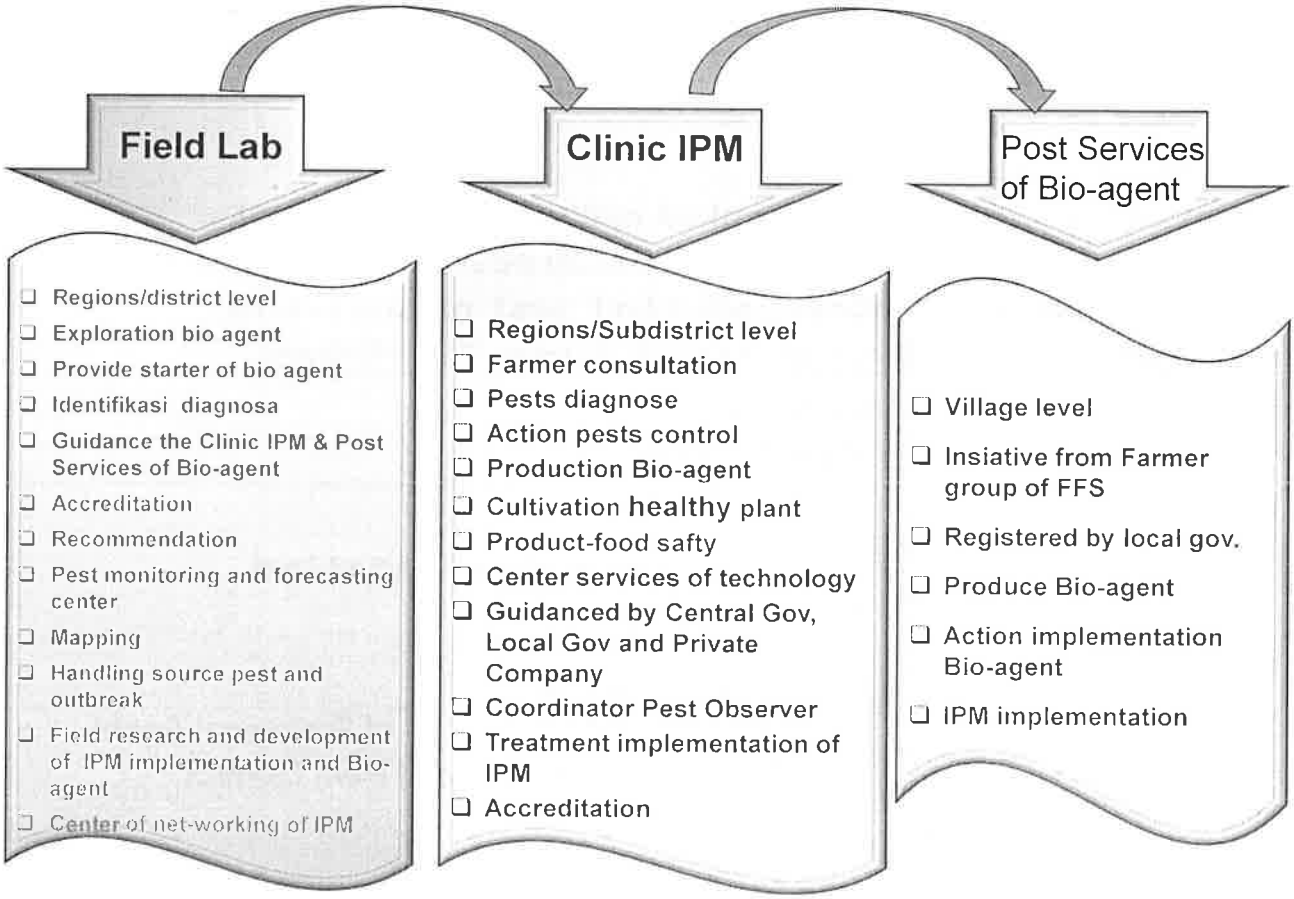
IPM Implementation

- AWM (ALPP, PFA, PFPS)
- Farmer group Scale
- Institutional (Post Service of Biological Agent Integrated and Clinic of Pest Control
- Actions Pest control

COORDINATION MECHANISM



RESPONSIBLELITY OF INSTITUTION



MAIN COMODITY

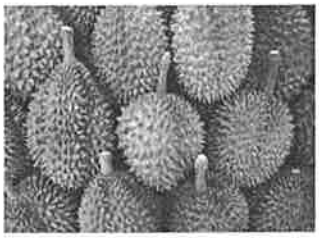
- Vegetables

  Chilli, shallot, garlic, potato, tomato
- Fruits

  Mangosteen, mango, citrus, banana, salacca, durian, pineapple,
- Floriculture

  Chrysantemum, orchid, raphis, leatherleaf, jasmine
- Medicinal plants

  Ginger, turmaric



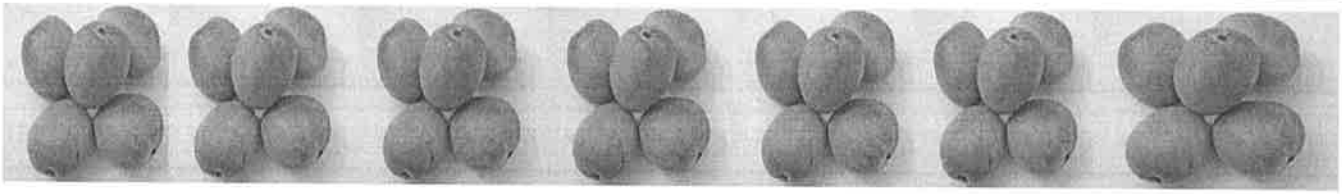
Target, Strategy, and Principles in IPM Implementation

- The target of IPM implementation: (1) pest population and crop damage are below economic threshold, (2i) agricultural productivity is maintained stable at high level, (3) farmers income and welfare increase, and (4) adverse effects on human health and the environment are optimally reduced.
- Principles of IPM implementation: (1) healthy cultivation, (2) conservation and utilization of natural enemies, (3) regular monitoring on ecosystem, and (4) farmers are directed to be acting as experts in their farming activities.
- The IPM strategy is applied by integrating all available pest control techniques, so as compatible one each other, complying with ecological and economical basis.

IMPLEMENTATION MECHANISM

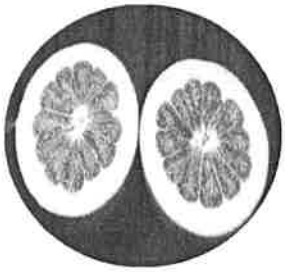
Input	Process	Output

• HUMAN RESOURCES
  • Directorate of Horti Protection,
  • Food Crop and Horti Protection Center,
  • Field Lab,
  • Agric Services,
  • Pest observer,
  • Farmer group
• Material
• Technology
• Budget
  • National budget
  • Local budget
	• Coordination (Stakeholder:, DHP, FCPC/Field lab, Agric Services, Farmeri)
	• Mapping
	• Capacity building (TOT, socialization, workshop)
	• Monitoring
	• Field Hygine
	• FFD, Publication mass media
	• Database and reporting
	• Public awareness of AWM
		• Improve knowledge and skill officer and farmer
		• Intensity fruit infected low
		• Improve product quality
		• AWM, establish ALPP, PFPS
		• Development the system pest management



Role of Horticulture Protection

- To Secure the production
- To improve product quality
- To empower the farmers to implement of IPM
- To meet market access
- To full-fill SPS requirements



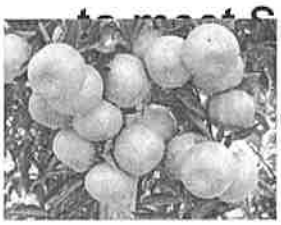
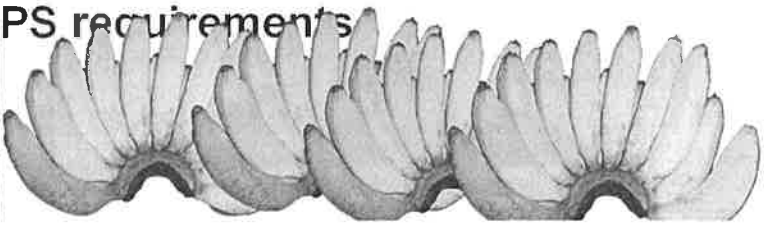
To Secure of production

- Pest monitoring, population dynamics, climate, yield loss;
- Identification of pests;
- Technical guidance of pest prevention / Pest control operations;
- Pest control recommendations;
- Disseminate information on pest prevention
- Development of Pest Management
- Farmer Field School;
- Implementation of IPM;
- Action Pest control;
- Development of application of biological agents




To Improve Quality Product

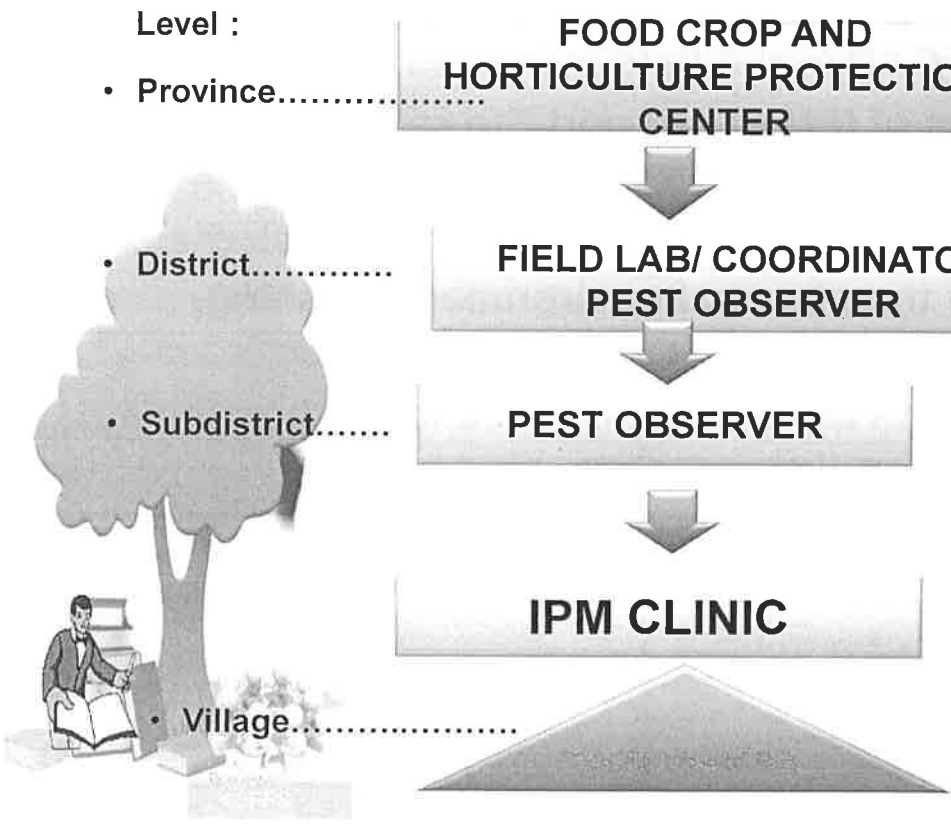
- ✓ Application of GAP in the field is supported through the implementation of IPM to support the certification of the garden
- ✓ Application of environmentally friendly technologies:
- ✓ How to modify the physical environment: pruning, sanitation, eradication
- ✓ Implementation of biological agents and bio pesticides
- ✓ Monitoring of pesticide residues
- ✓ Fulfillment of SPS requirements
- ✓ Implement synergistic activity of plant protection system to meet SPS requirements


To empower the farmers to implement of IPM

- ✓ **Technical guidance**
- ✓ **Provide guidance book, leaflet, brosure**
- ✓ **Socialization pest control**
- ✓ **Disseminasi information**
- ✓ **Farmer Field School (FFS)**
- ✓ **Pest control actions Gerakan**

FLOW Coaching of IPM

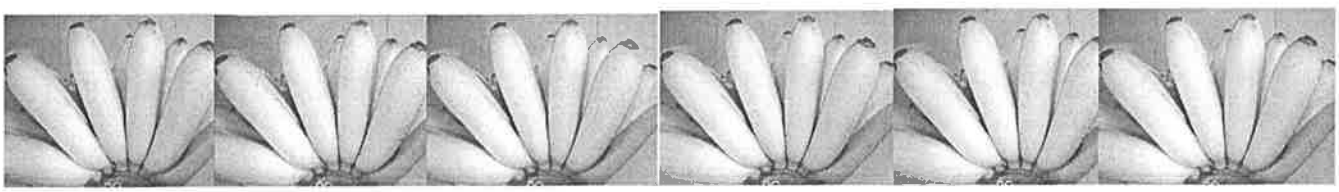


Supporting Market Access

- Strengthening existing systems, human resources and institutions in Indonesia to meet SPS-WTO requirements (system of monitoring, identification, data base, reporting, collection of pest species), field officers and Field Laboratory.
- Preparation of guideline surveillance
- Preparation of pest list according to international standards (ISPM)
- Cooporation: *joint surveillance*, protokol (surveilans, *Pest Free Production Site, ALPP, PFA*), data base, *pest management*
- Negotiate for market access (*draft protocol for export*)
- Field preparation for export (facilitation of farmer groups in facing field inspection from trading partners)).
- Monitoring of pesticide residues

To Full fill of SPS requirements

- ❑ **Pest list (**Mangosteen, mango, salacca, pineapple, rambutan, durian, banana, avocado, citrus, dragon fruit, melon, water melon, strawberry, lansicum, jackfruit, **shallot, paprika, potatochilli)**
- ❑ **Draft Ministry Decree concerning of pest surveillance**
- ❑ **Implementation of IPM**
- ❑ **Analysis of pesticide residues (mangosteen, salacca, mango, dragon fruit, melon, strowbery, shallot, potato, chilli, cabbage)**
- ❑ **Analysis of pesticide residues Importir fruit: grape, longan, per, appel, mandarin, carrot, garlic)**
- ❑ **Preparation of *Area of Low Pest Prevalence, Pest Free Prodoction Site*): fruit fly, mango seed weevil, mealy bug**
- ❑ **PFPS: paprika, melon**
- ❑ ***Establish of Disinfestation of fruit fly by Vapor Heat Treatment*** **(VHT) on Gedong mango**



COMODITY POTENTIAL EXPORT

- Vegetable
  Shallot, leafy vegetable, carrot, baby french bean, bell pepper

- Fruits
  Mangosteen, mango, salacca, pineapple, rambutan, durian, banana, avocado, citrus, dragon fruit, melon, water melon, strawberry, lansicum, jackfruit

- Floriculture
  Chrysantemum, orchid, raphis, leatherleaf, jasmine, bonsai

- Medicinal plant
  Ginger, tumaric, herbal

CONCEPT *AREA WIDE MANAGEMENT OF FRUIT FLIES*

PURPOSE

- To reduce the fruit flies population and intensity fruit flies attacked in wide area (100 ha)
- To improve fruit quality
- Institutional strengthening
- Inisiate of *Area Low Pest Prevalent* (ALPP)
- To establish area wide fruit fly management system

OUTPUT:

1. Technical aspects
   - Manage the fruit fly population
   - Data base
   - Mapping
   - Reduce yield loss

2. Social aspects

To improve the capability and knowledge of farmers and field officers

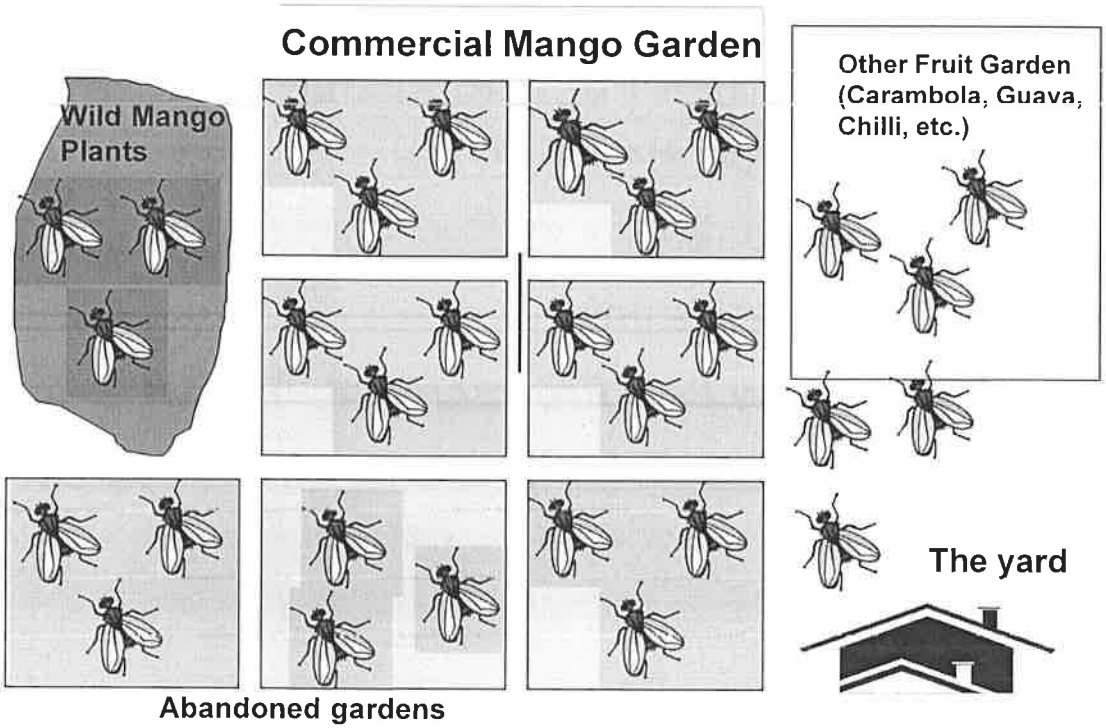
3. Economic influence

Quality, product of fruit price, price and income increases.

4. Ecological aspects

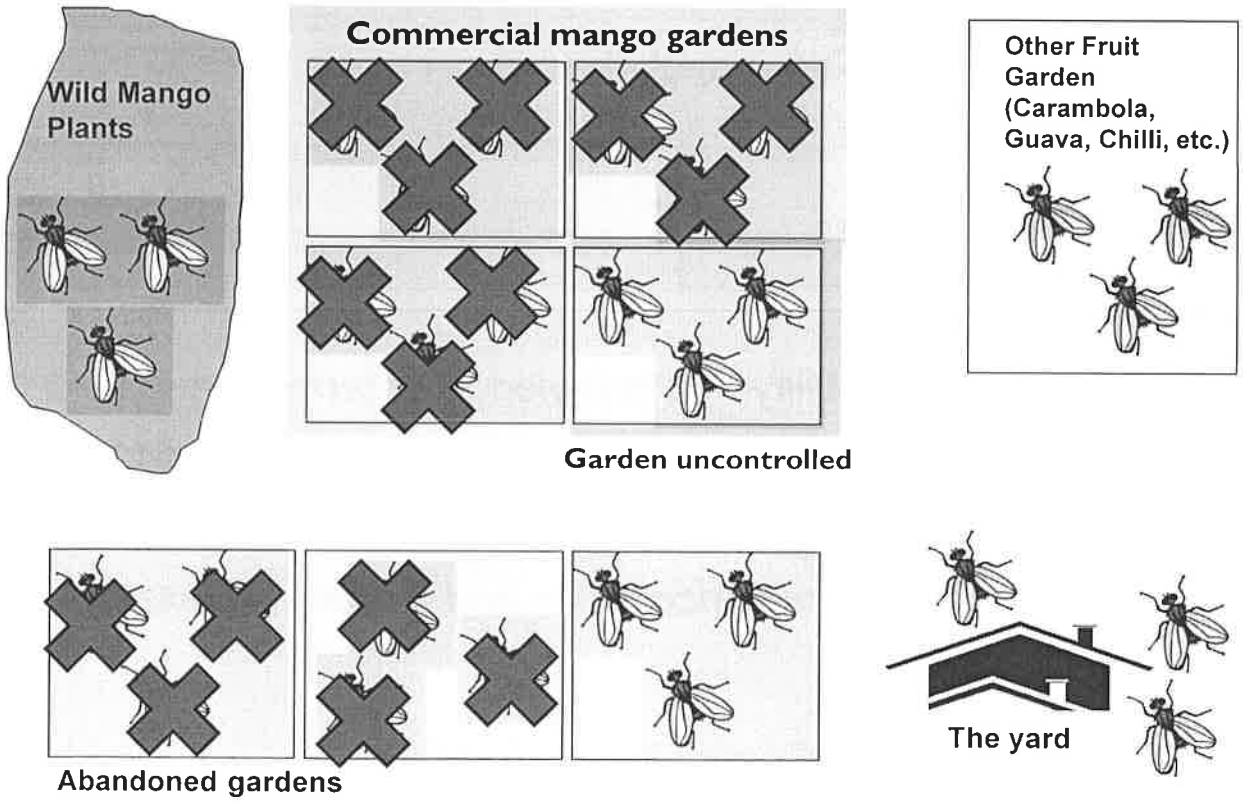
Reduce the use of chemical pesticides

Distribution of Fruit Fly in Mango Farm and the Environment (An Example)

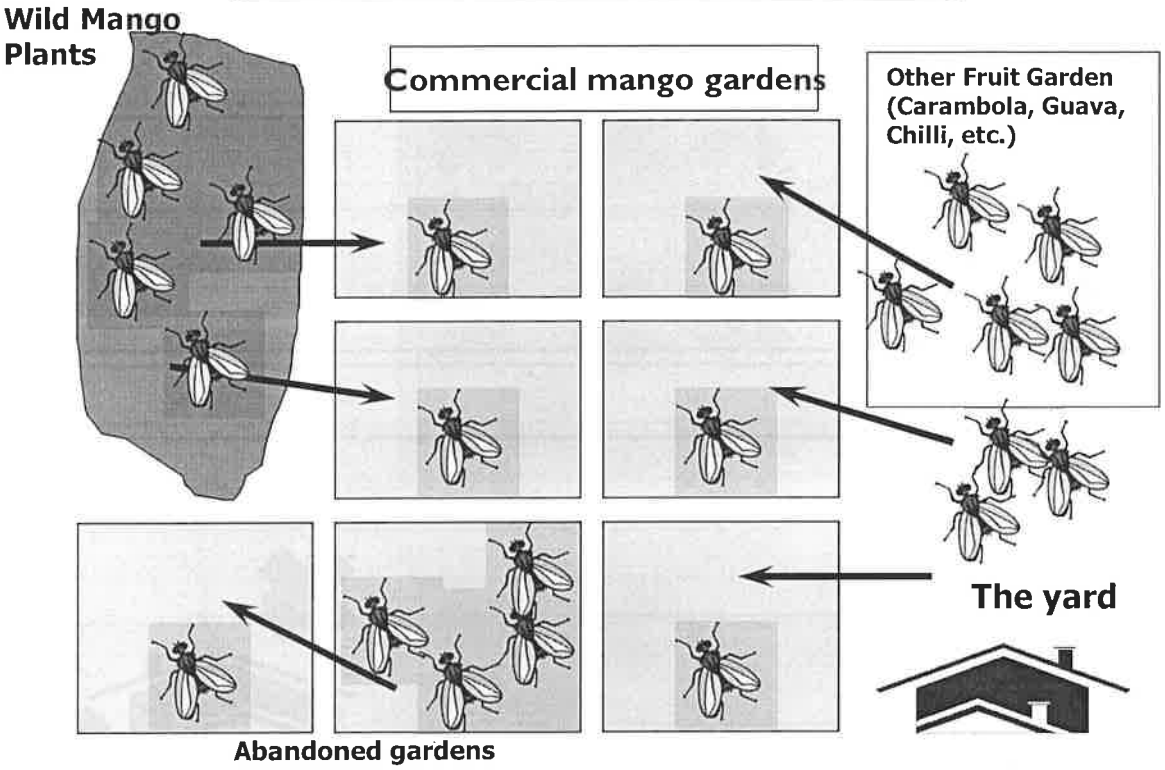


Control with Conventional IPM:

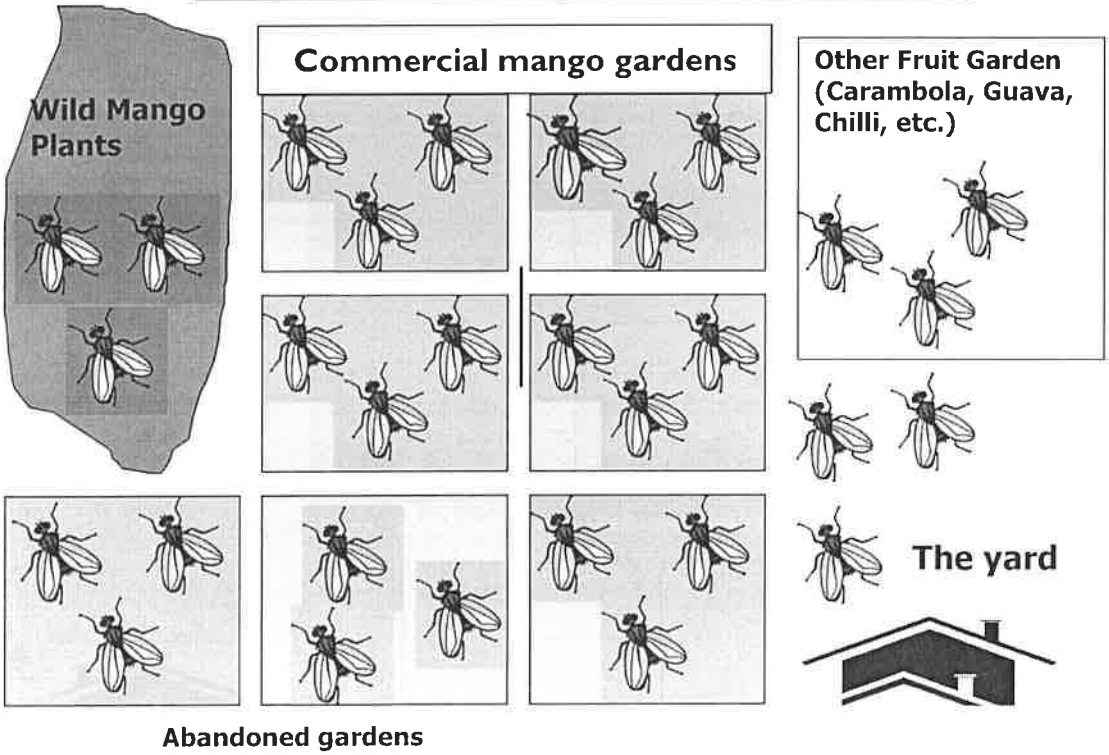
(only in the garden plot, not the whole plot of the garden)



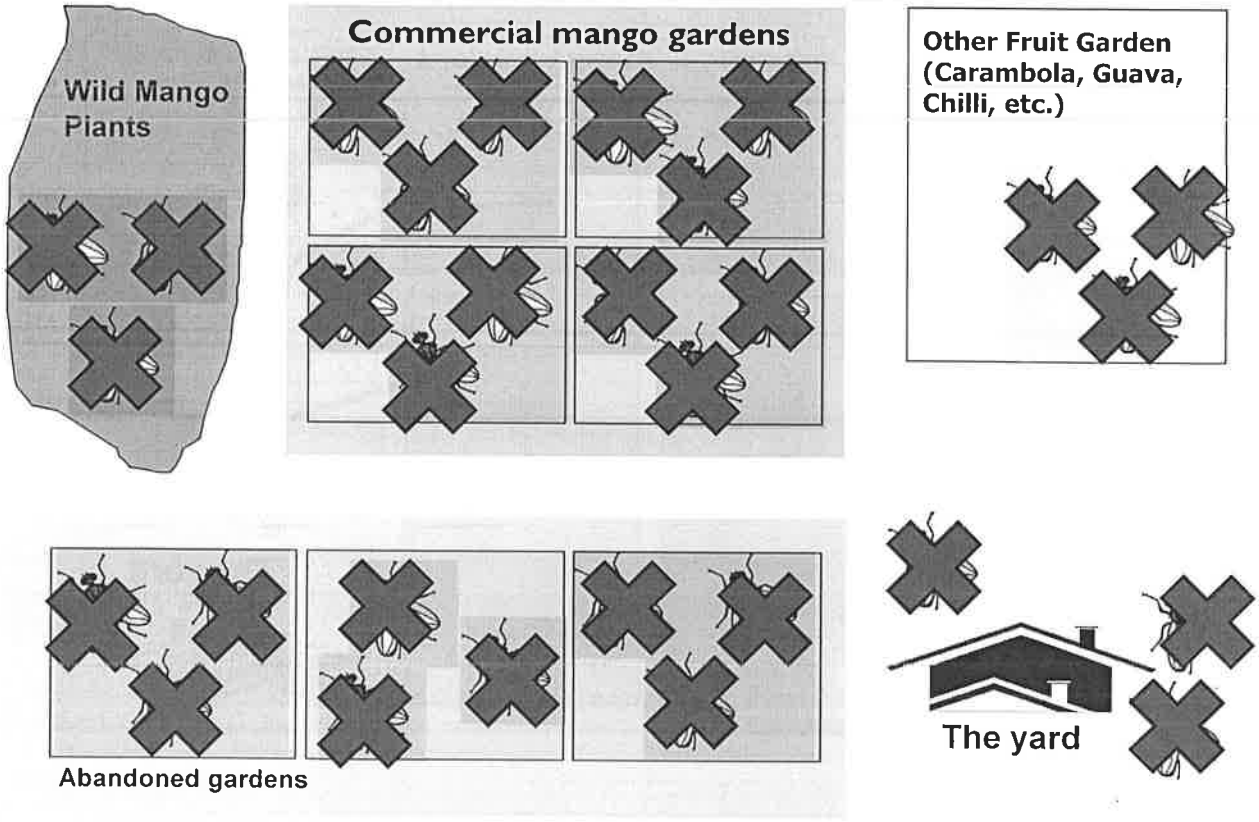
After Conventional IPM
(Occurrence of Pest Transmission)



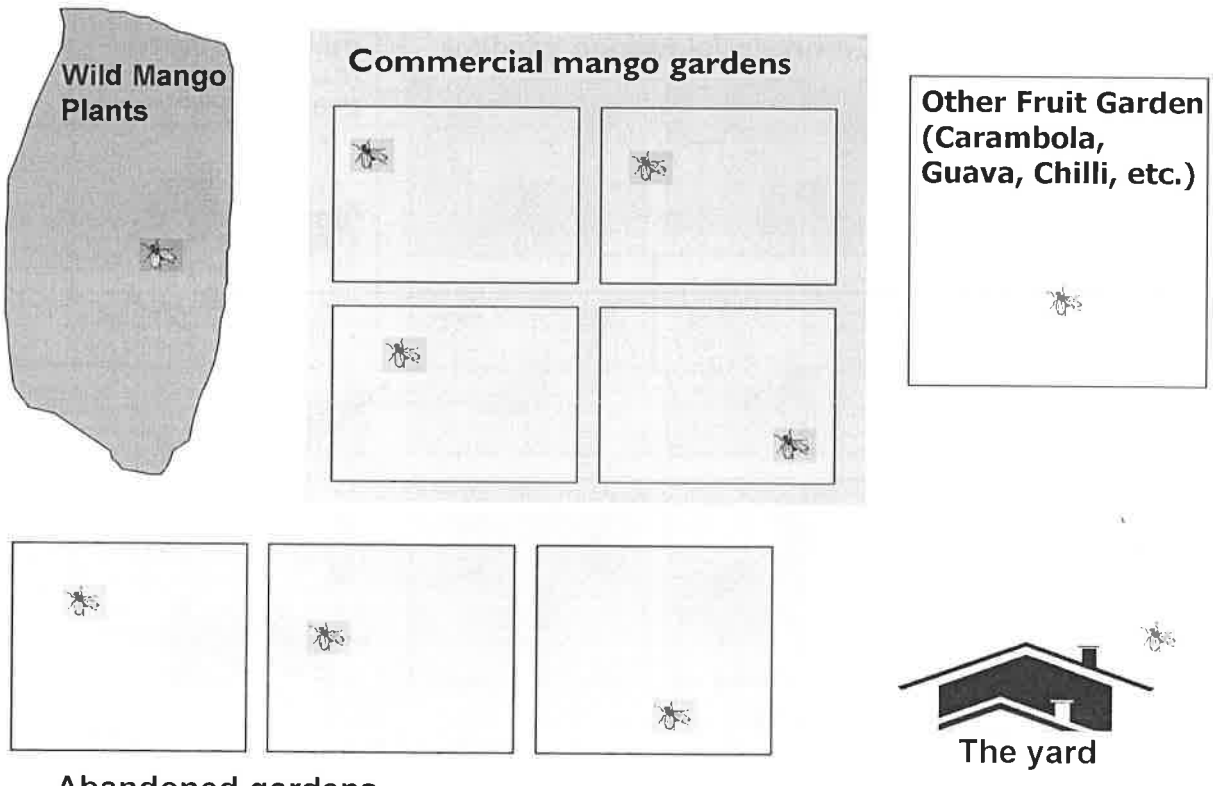
Conventional IPM Results
(Pest Population Back Like As Originally)



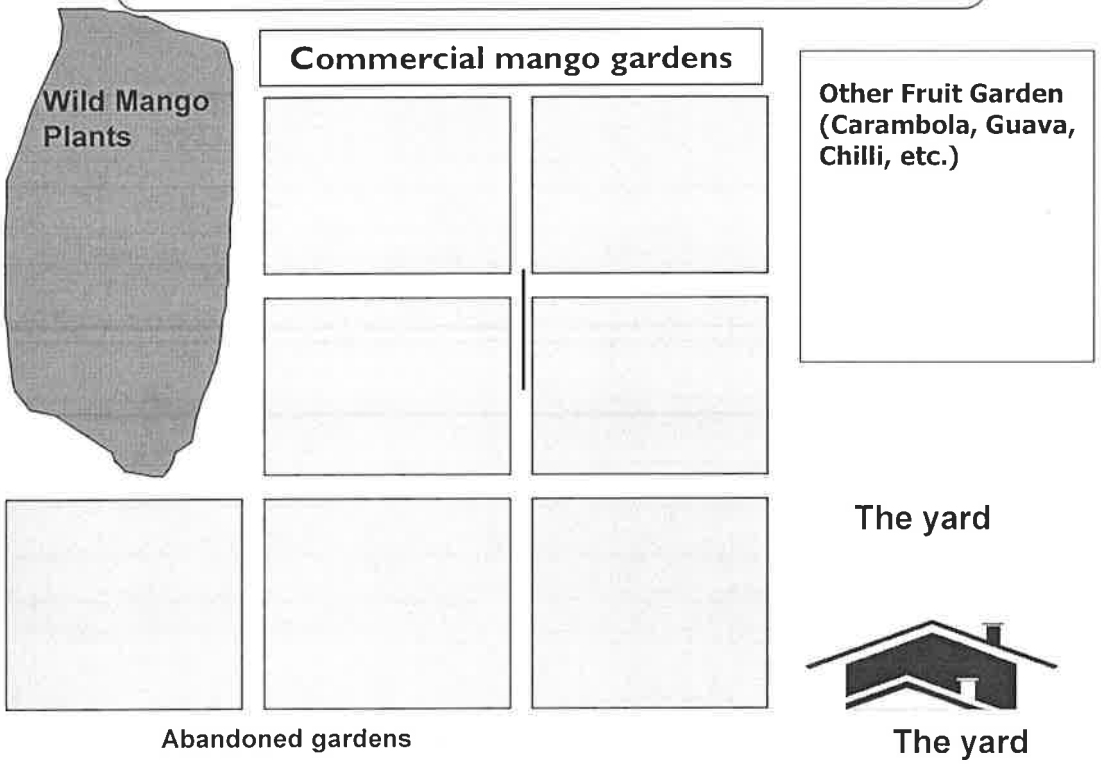
Area Wide Management of fruit flies (done to the entire area, Total Population)



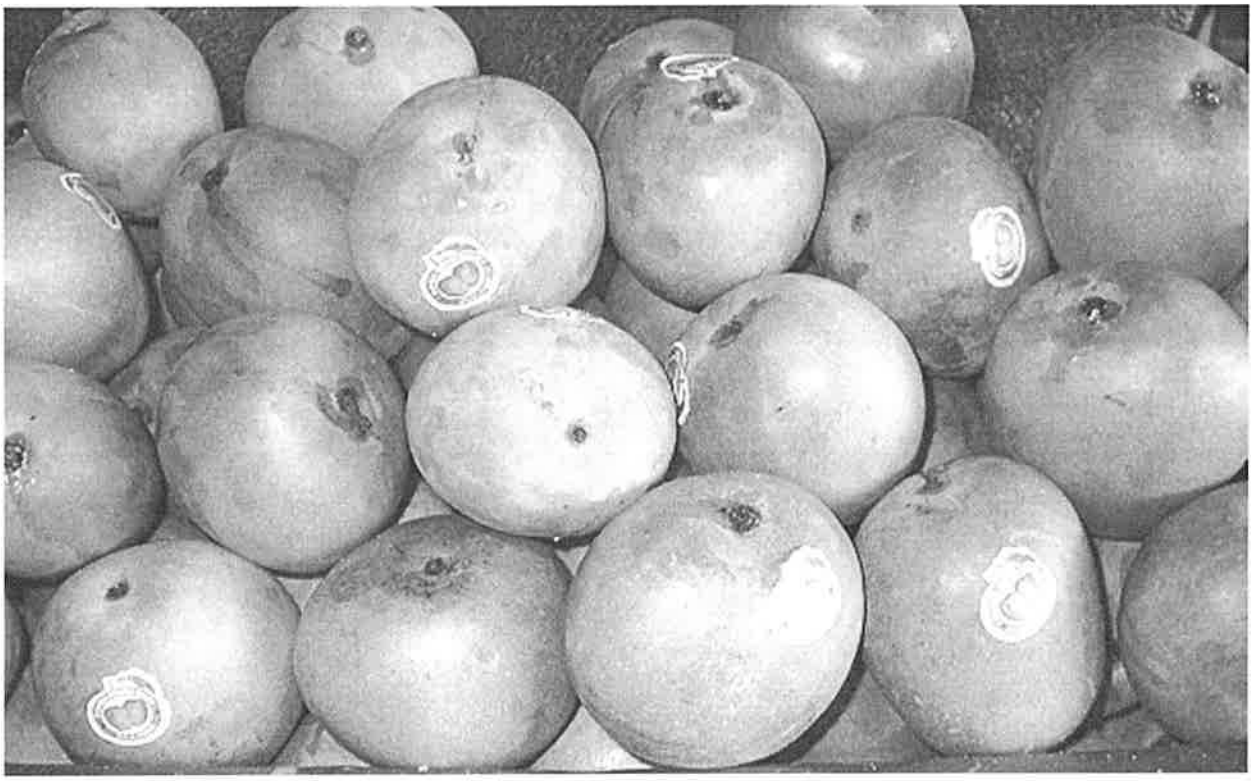
Area Wide Management of fruit flies (suppress the population of fruit flies)



ERADICATION PROGRAMS
(Destination IPM → PEST FREE AREA)



Thank you



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Status of Fruit Flies in Indonesia

Suputa
Plant Protection Department
Faculty of Agriculture, Gadjah Mada University

Applied Research Institute of Agriculture Quarantine (ARIAQ)

Address http://hpt.faperta.ugm.ac.id/suputa/

Referenses

ISPM 8

- https://www.ippc.int/static/media/files/publications/en/1323945129_ISPM_08_1998_En_2011-11-29_Refor.pdf

Update on the Host Range of Different Species of Fruit Flies in Indonesia.

Suputa, Y.A. Trisyono, E. Martono, & S.S. Siwi, 2010. *Indonesian Journal of Plant Protection*. 16 (2): 62-75.

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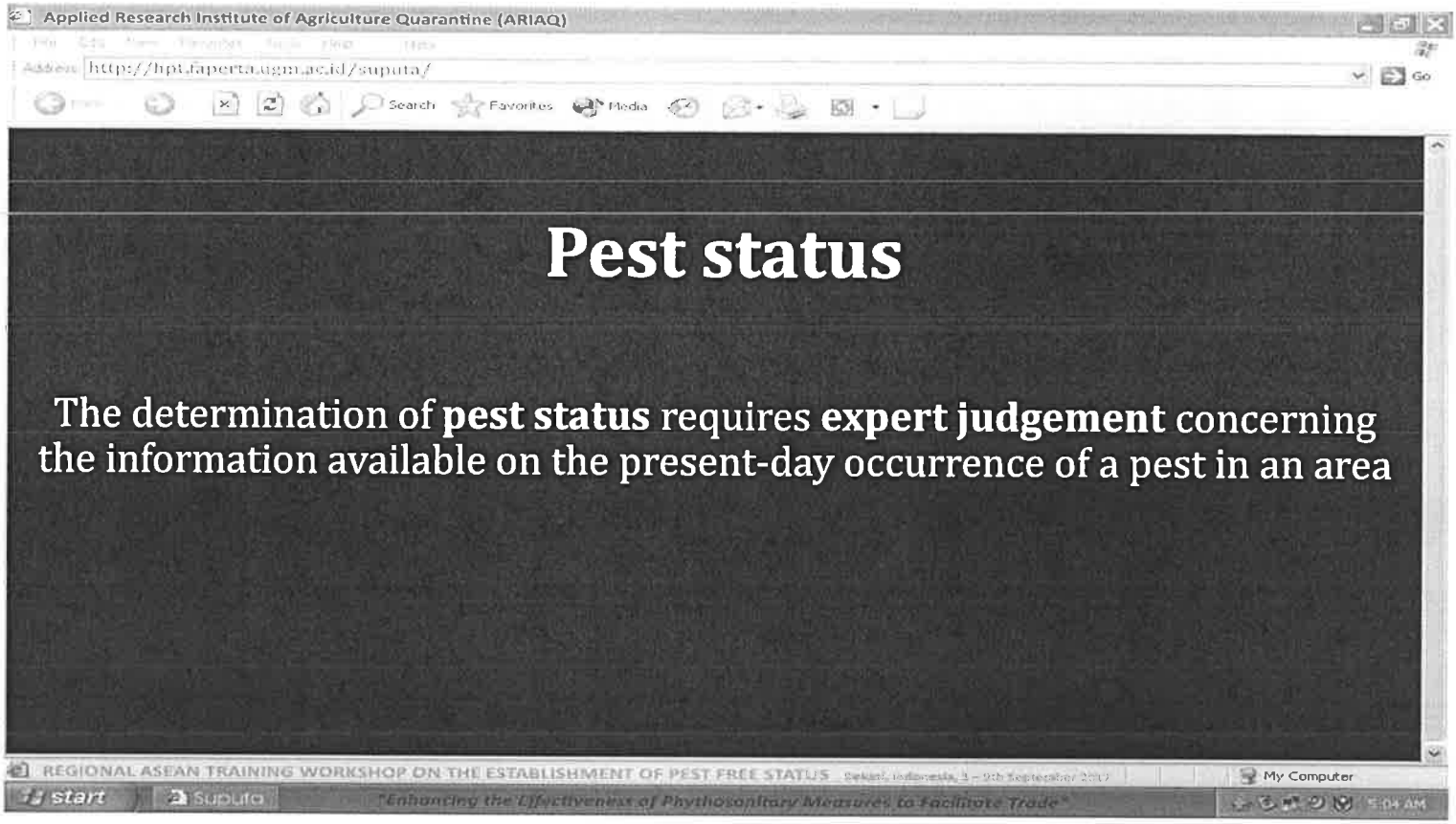
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Pest status
The determination of pest status requires expert judgement concerning the information available on the present-day occurrence of a pest in an area
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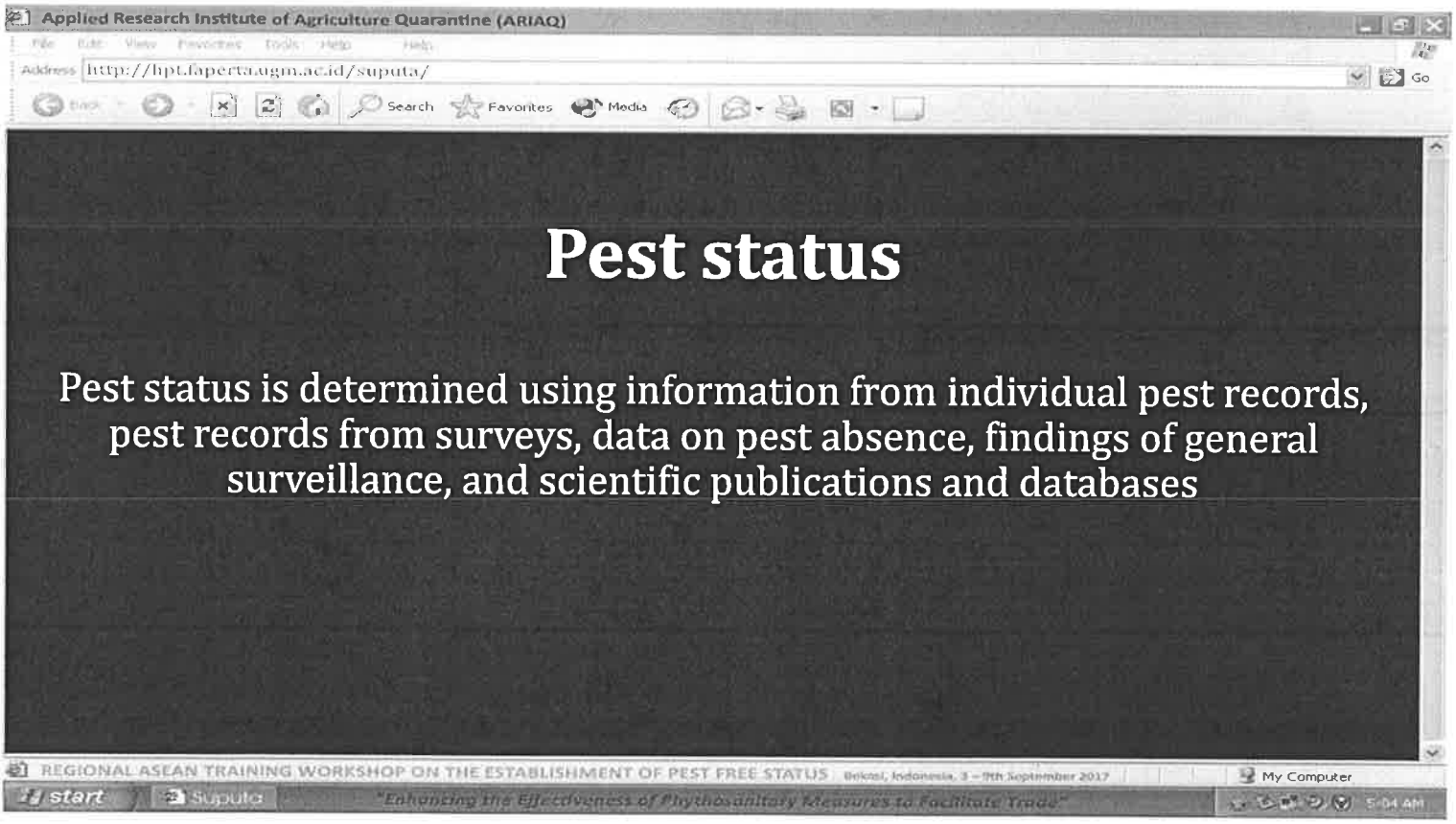
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Pest status
Pest status is determined using information from individual pest records, pest records from surveys, data on pest absence, findings of general surveillance, and scientific publications and databases
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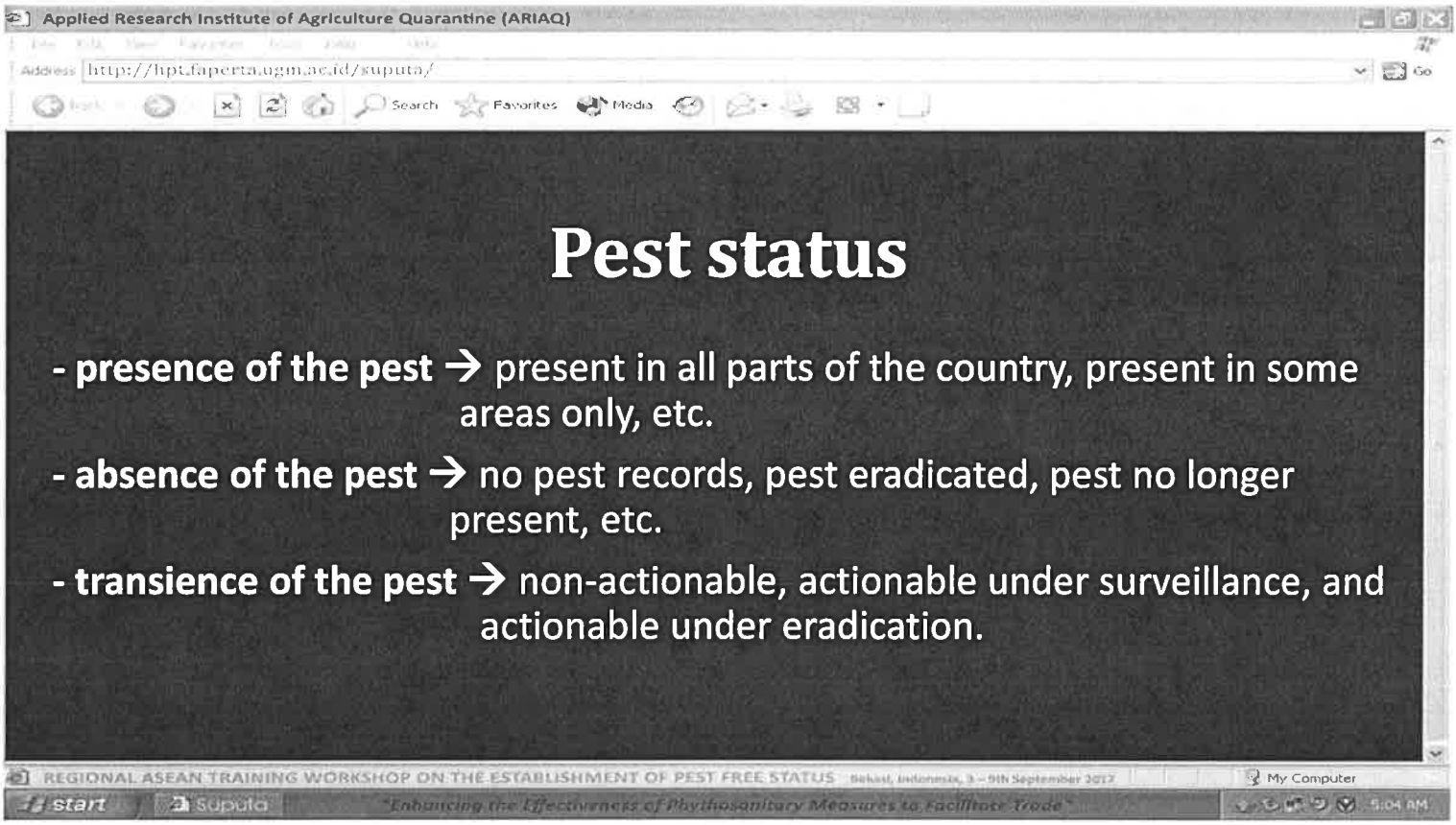
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Pest status
- presence of the pest → present in all parts of the country, present in some areas only, etc.
- absence of the pest → no pest records, pest eradicated, pest no longer present, etc.
- transience of the pest → non-actionable, actionable under surveillance, and actionable under eradication.
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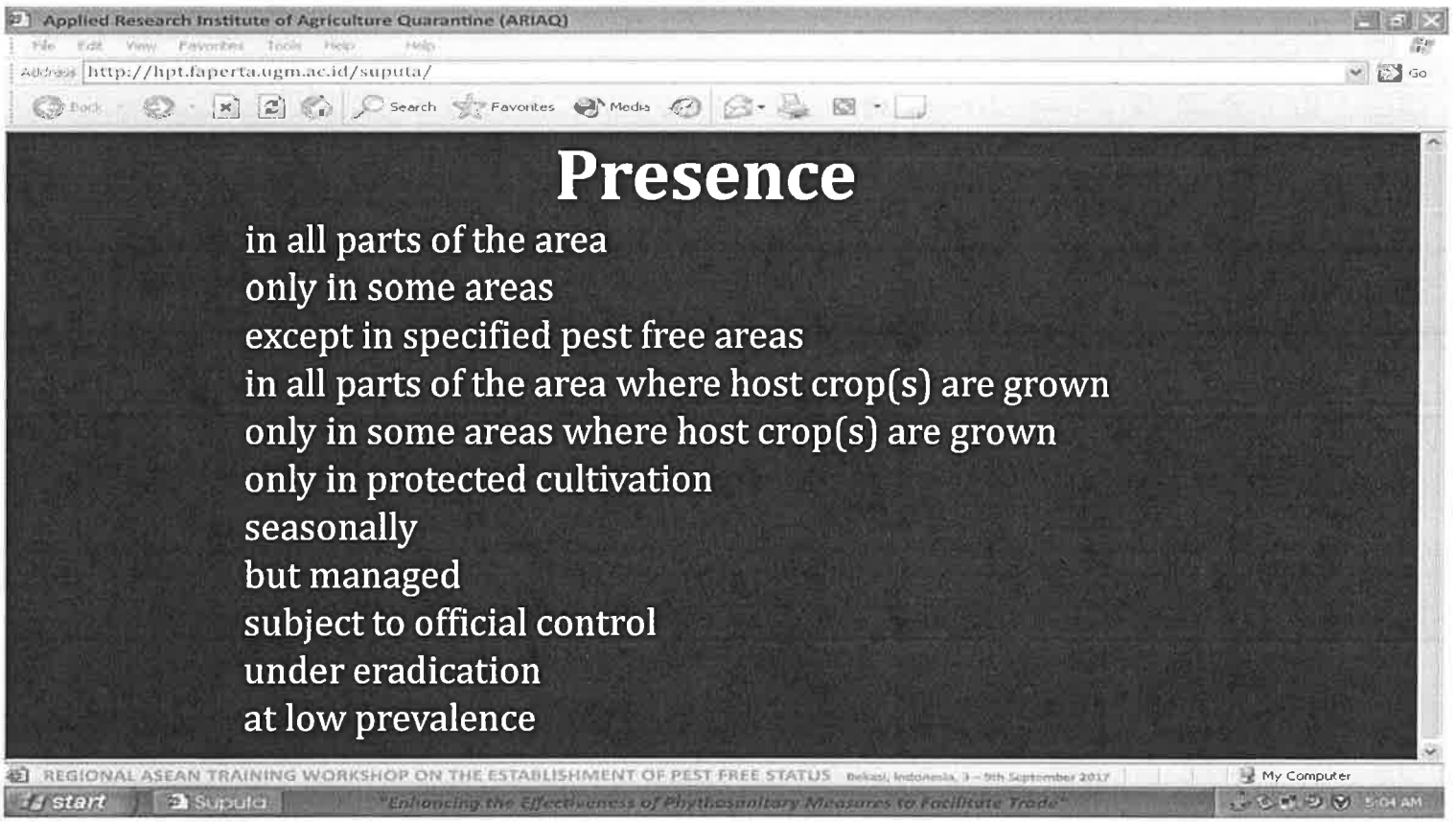
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Presence
in all parts of the area
only in some areas
except in specified pest free areas
in all parts of the area where host crop(s) are grown
only in some areas where host crop(s) are grown
only in protected cultivation
seasonally
but managed
subject to official control
under eradication
at low prevalence
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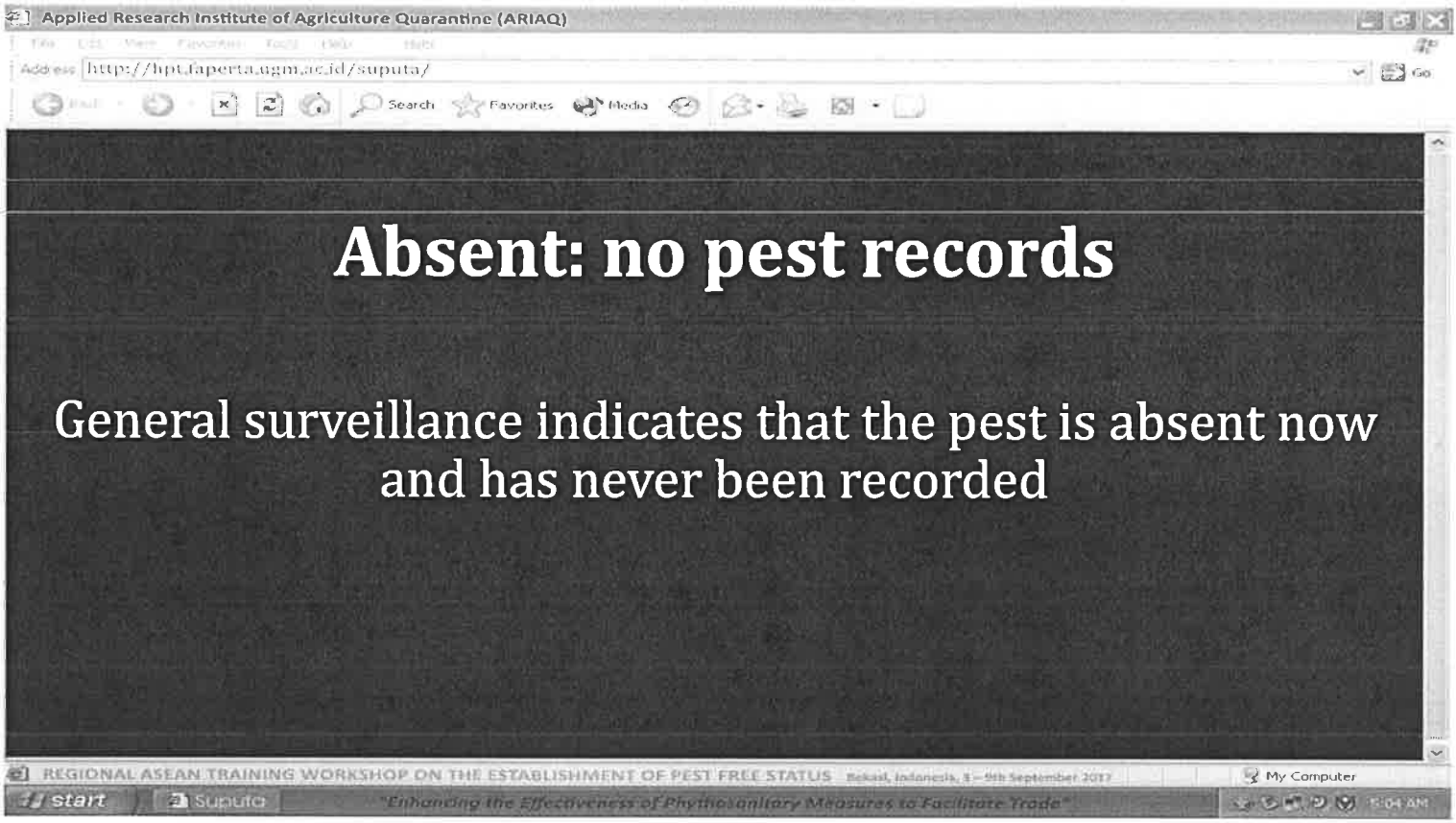
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Absent: no pest records
General surveillance indicates that the pest is absent now and has never been recorded
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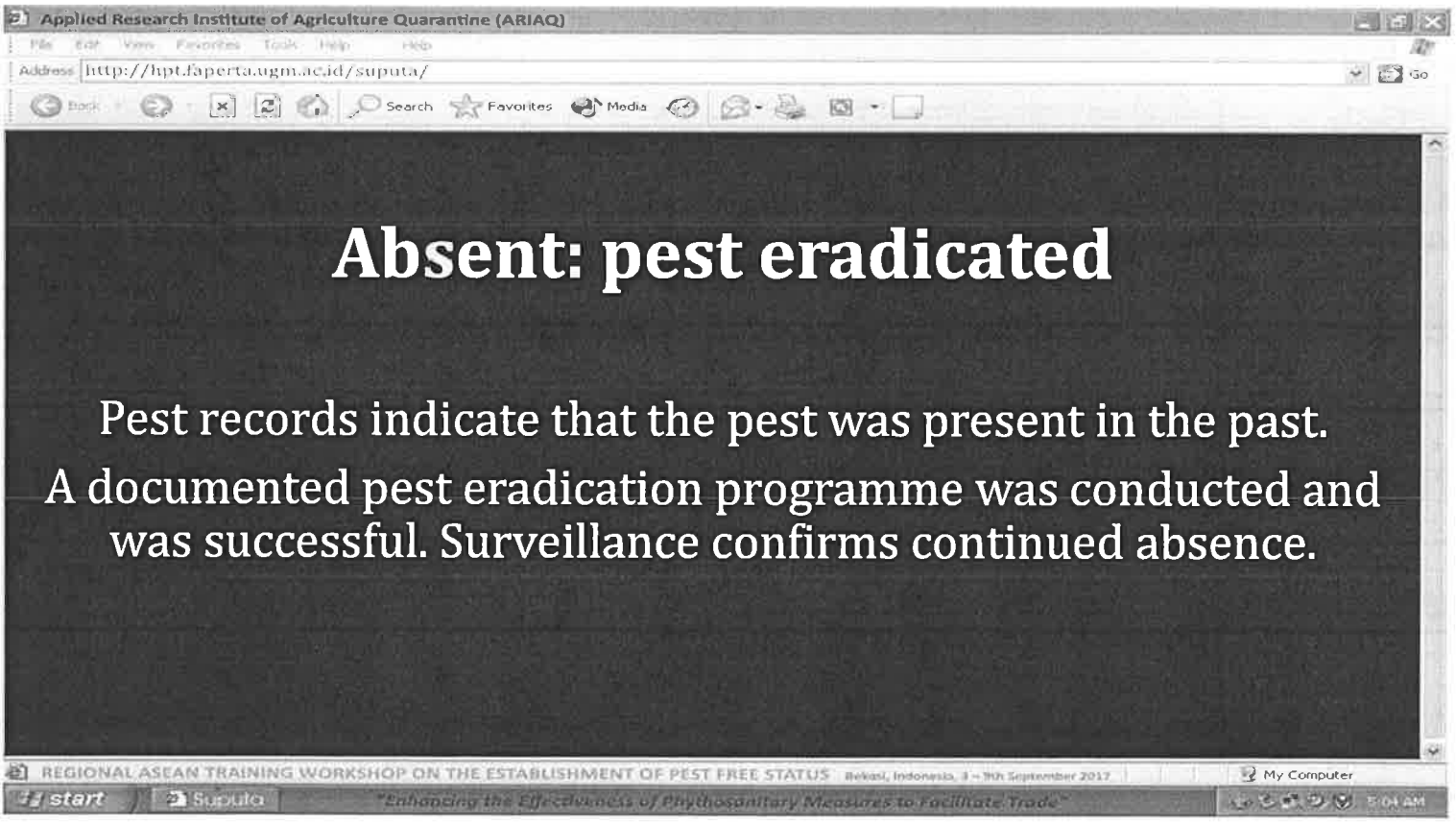
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Absent: pest eradicated
Pest records indicate that the pest was present in the past.
A documented pest eradication programme was conducted and was successful. Surveillance confirms continued absence.
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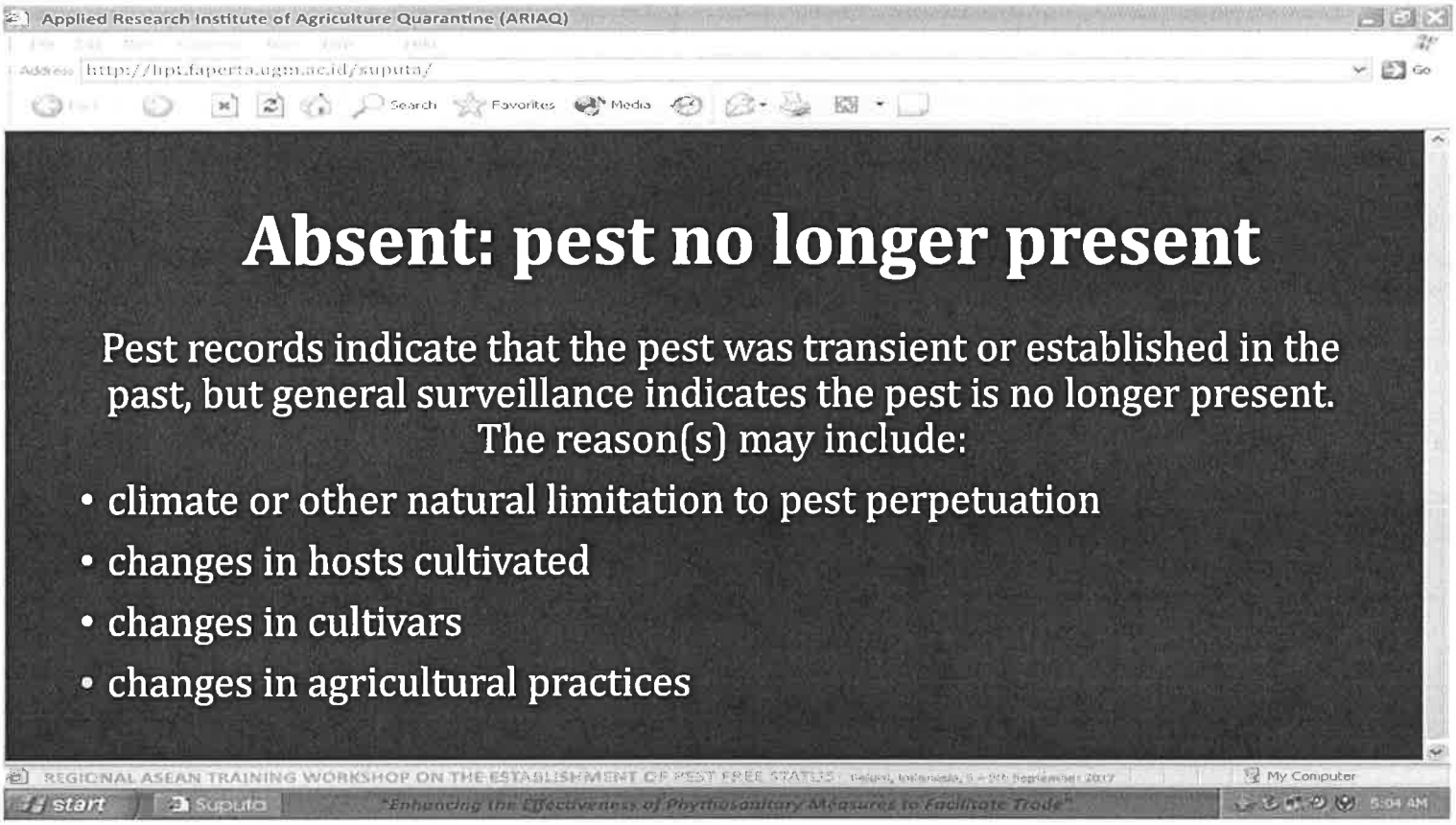
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Absent: pest no longer present
Pest records indicate that the pest was transient or established in the past, but general surveillance indicates the pest is no longer present. The reason(s) may include:
• climate or other natural limitation to pest perpetuation
• changes in hosts cultivated
• changes in cultivars
• changes in agricultural practices
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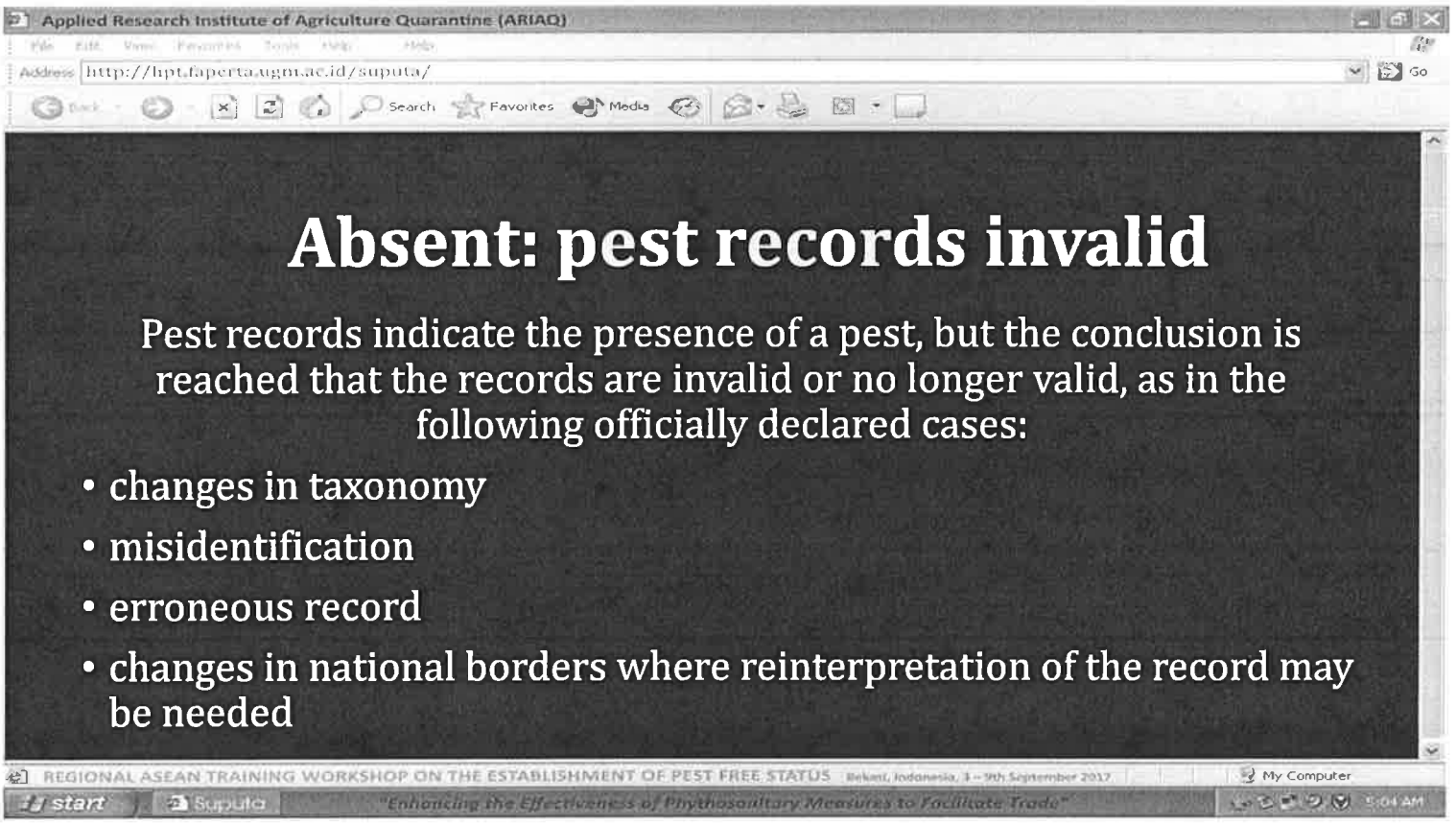
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Search Favorites Media
Absent: pest records invalid
Pest records indicate the presence of a pest, but the conclusion is reached that the records are invalid or no longer valid, as in the following officially declared cases:
• changes in taxonomy
• misidentification
• erroneous record
• changes in national borders where reinterpretation of the record may be needed
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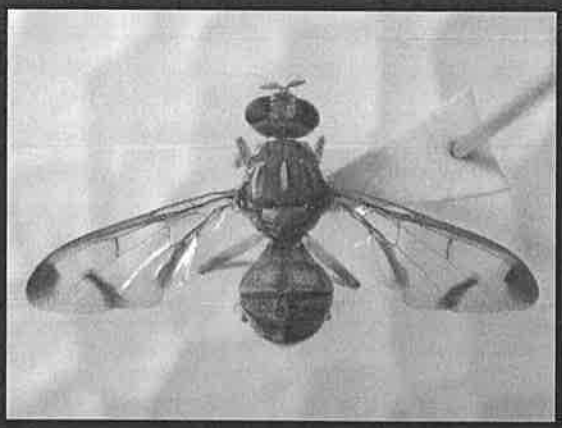
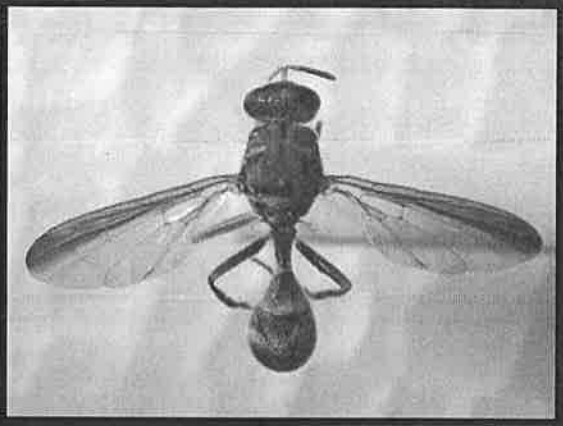
DIPTERA
Tephritidae

The difference between *Bactrocera* spp. and *Dacus* spp.





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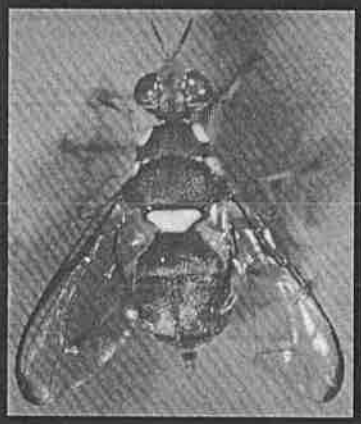
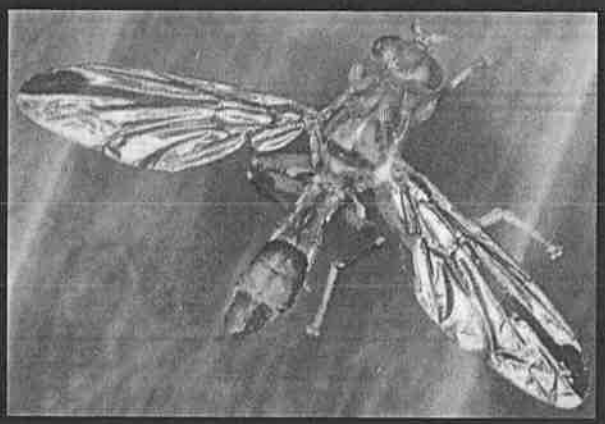
DIPTERA
Tephritidae

The difference between *Bactrocera* spp. and *Dacus* spp.





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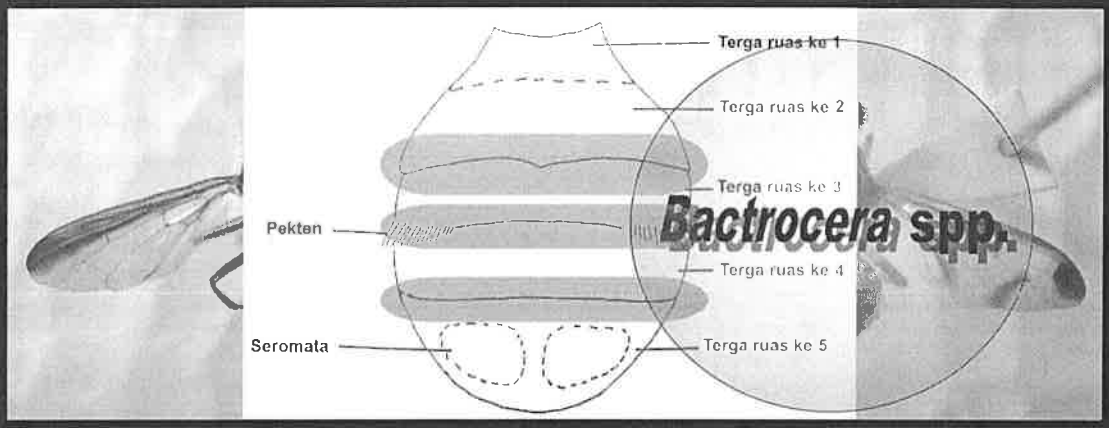
DIPTERA
Tephritidae

The difference between *Bactrocera* spp. and *Dacus* spp.



Dacus longicornis *Bactrocera cucurbitae*

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Absent: pest records unreliable

Pest records indicate the presence of a pest, but the determination leads to the conclusion that the records are unreliable, as in the following officially declared cases:

- ambiguous nomenclature
- outdated identification or diagnostic methods
- records cannot be considered reliable

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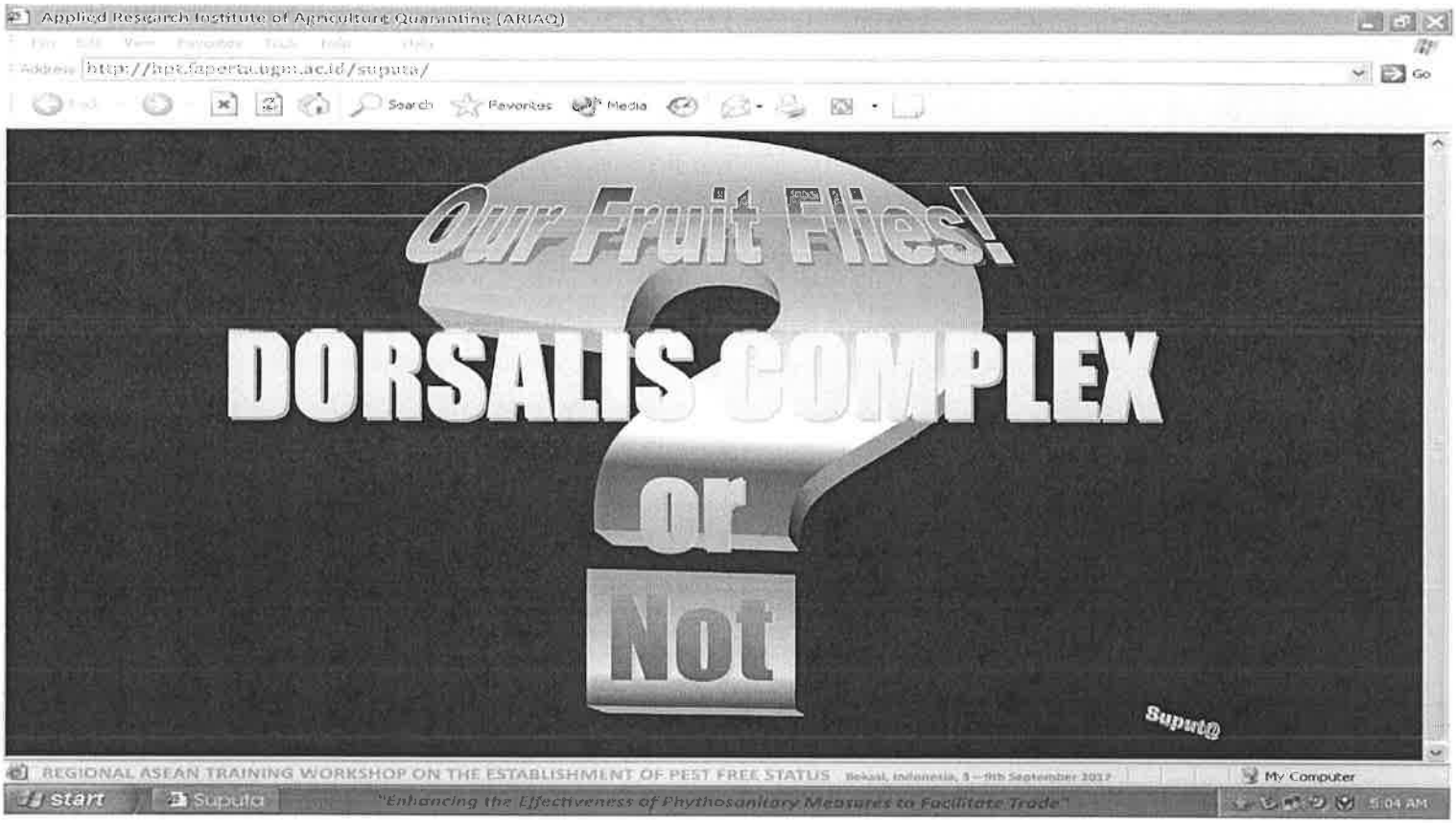
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Our Fruit Flies!
DORSALIS COMPLEX
or
Not
Suputa
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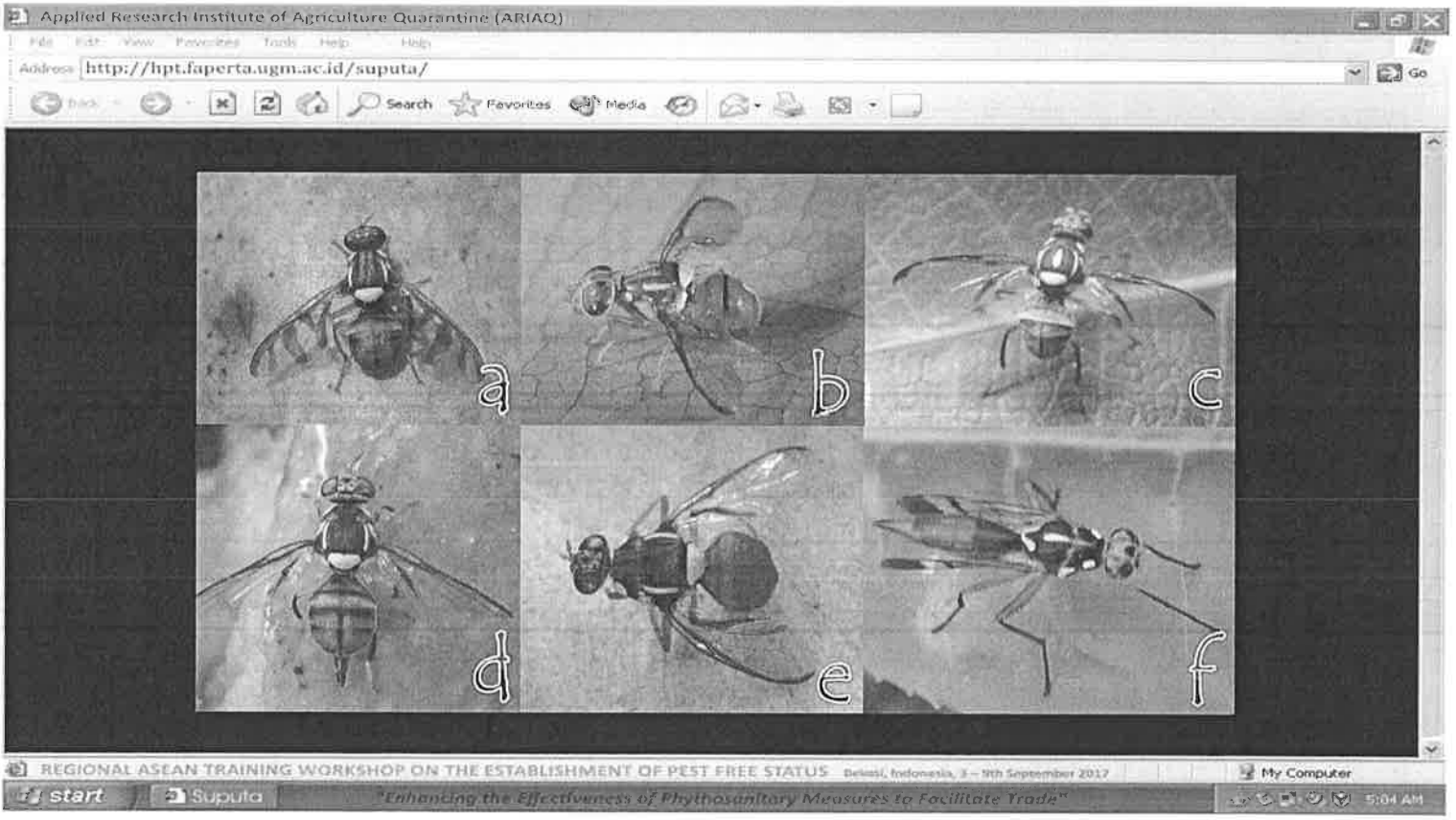
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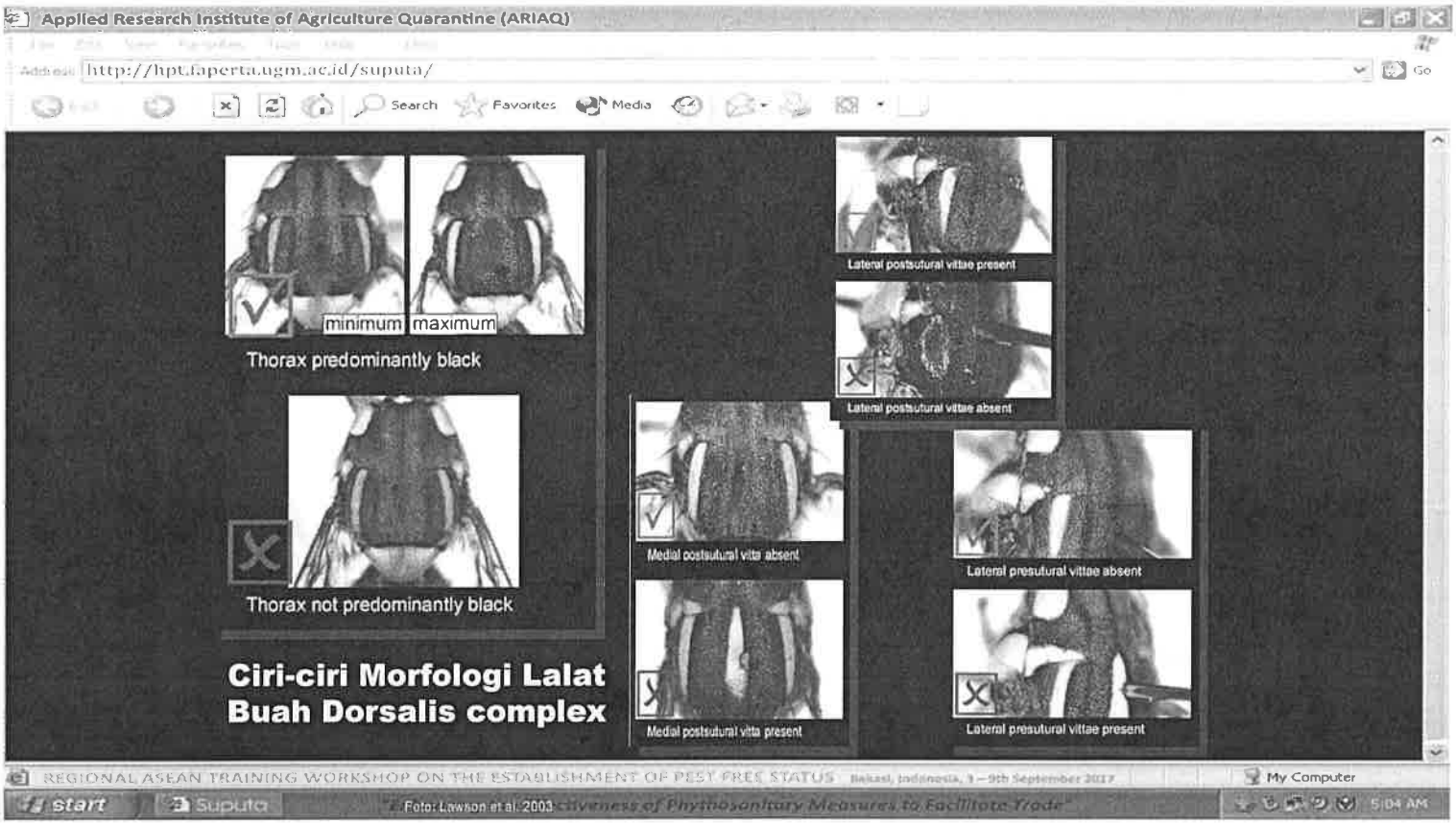
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minimum
maximum
Thorax predominantly black
Thorax not predominantly black
Lateral postsutural vittae present
Lateral postsutural vittae absent
Medial postsutural vitta absent
Medial postsutural vitta present
Lateral presutural vittae absent
Lateral presutural vittae present
Ciri-ciri Morfologi Lalat Buah Dorsalis complex
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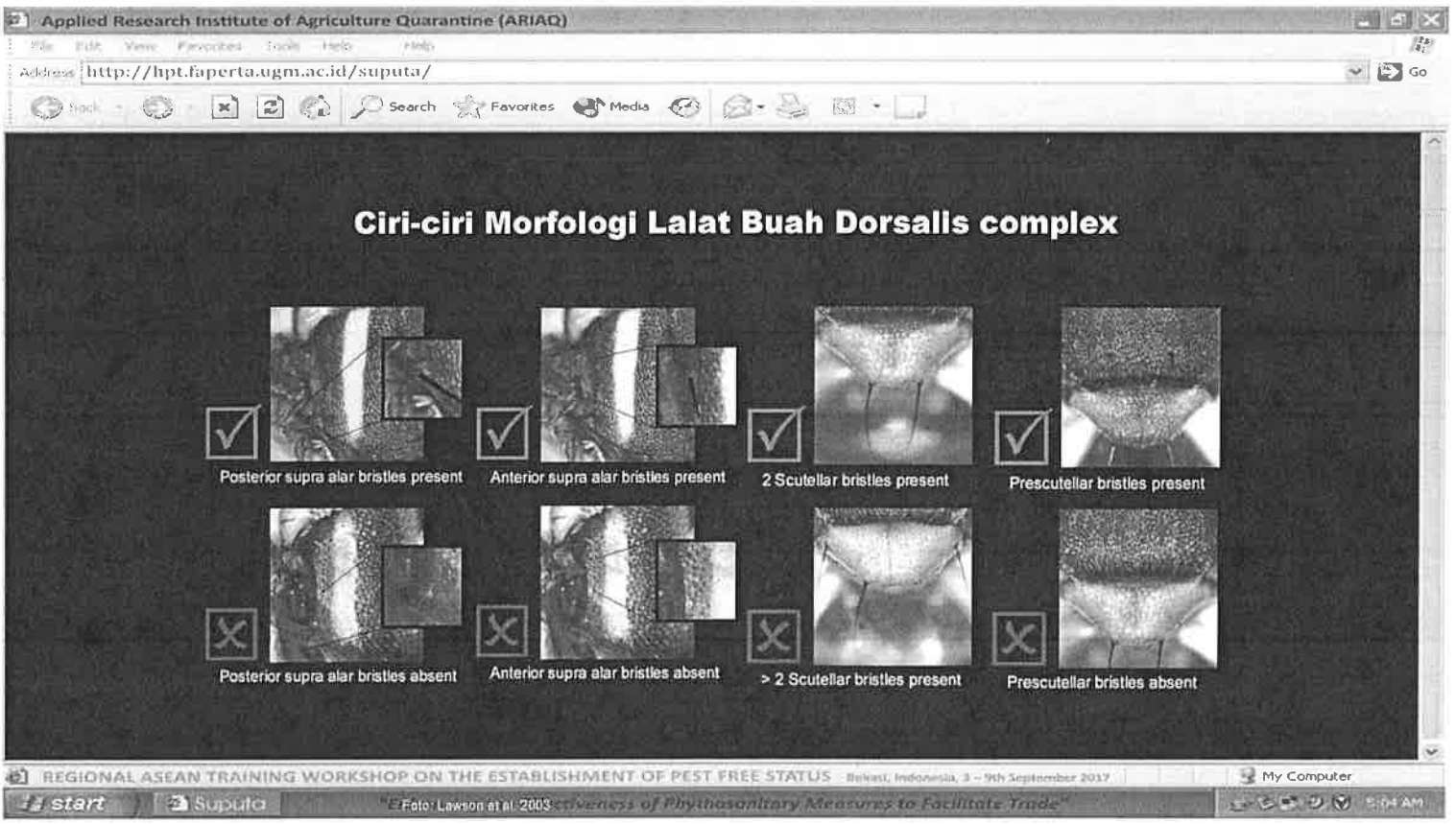
Foto: Lawson et al. 2003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http://hpt.faperta.ugm.ac.id/suputa/
Ciri-ciri Morfologi Lalat Buah Dorsalis complex
Posterior supra alar bristles present
Anterior supra alar bristles present
2 Scutellar bristles present
Prescutellar bristles present
Posterior supra alar bristles absent
Anterior supra alar bristles absent
> 2 Scutellar bristles present
Prescutellar bristles absent
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Foto: Lawson et al. 2003

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Identification of Fruit Fly Species using DNA analysis

DNA EXTRACTION

↓

ELECTROPHORESIS
GENOMIC DNA

↓

PCR

↓

ELECTROPHORESIS
PCR PRODUCT

PURIFICATION
PCR PRODUCT

↓

DNA QUANTITY
MEASUREMENT

↓

DNA
SEQUENCING

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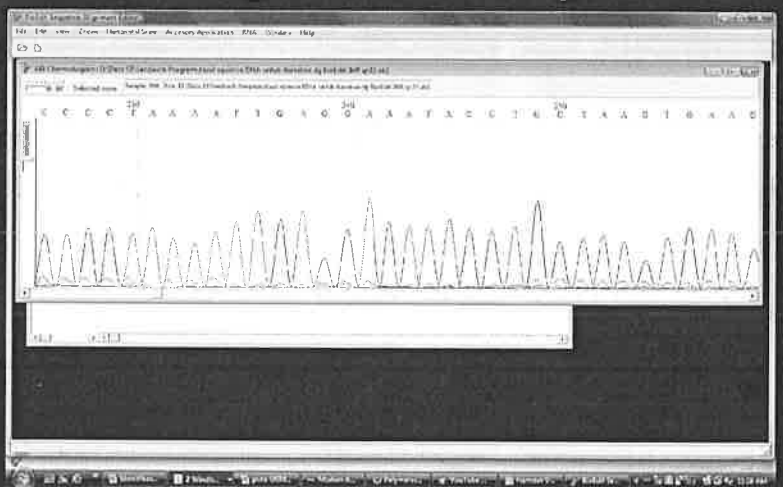
Identification of Fruit Fly Species using DNA analysis



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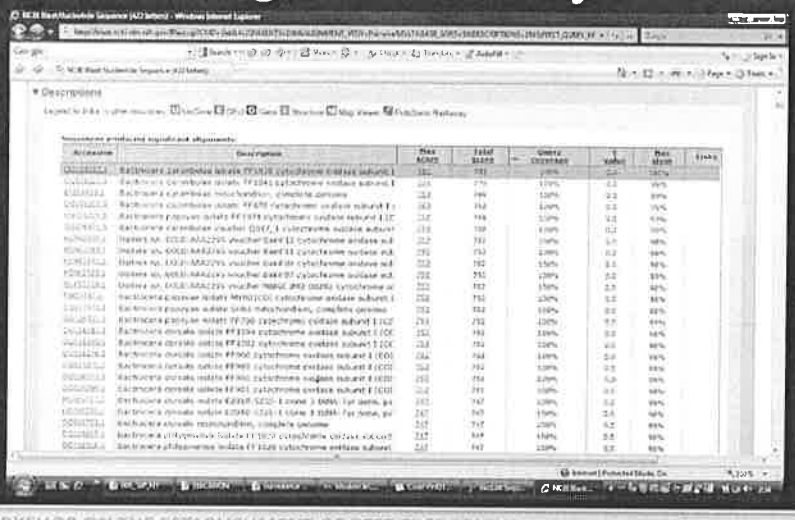
Identification of Fruit Fly Species using DNA analysis



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Absent: intercepted only

The pest has only been reported on consignments at a point of entry or initial destination or while under detention before release, treatment or destruction.

Surveillance confirms that the pest has not established.

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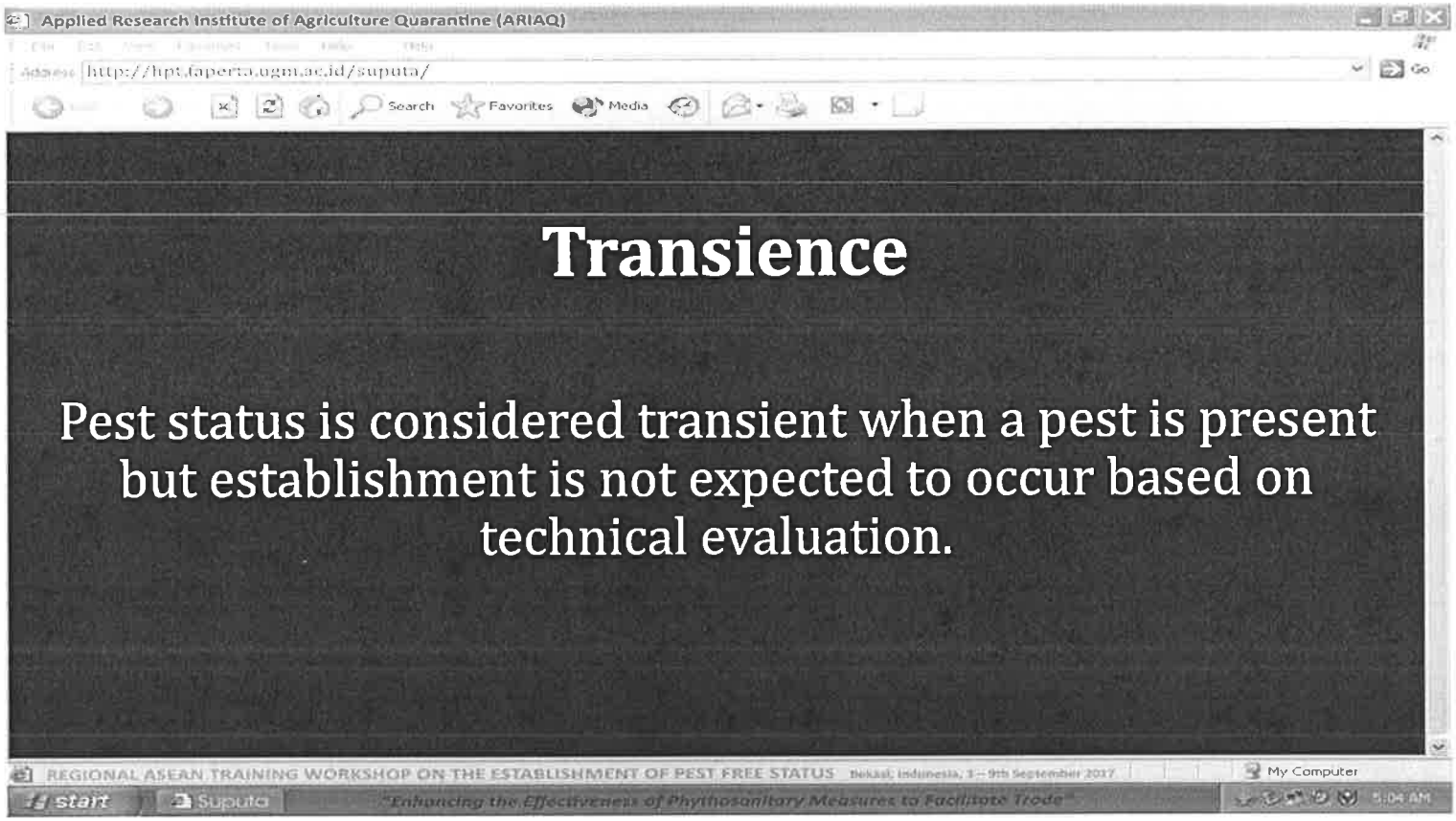
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Transience
Pest status is considered transient when a pest is present but establishment is not expected to occur based on technical evaluation.
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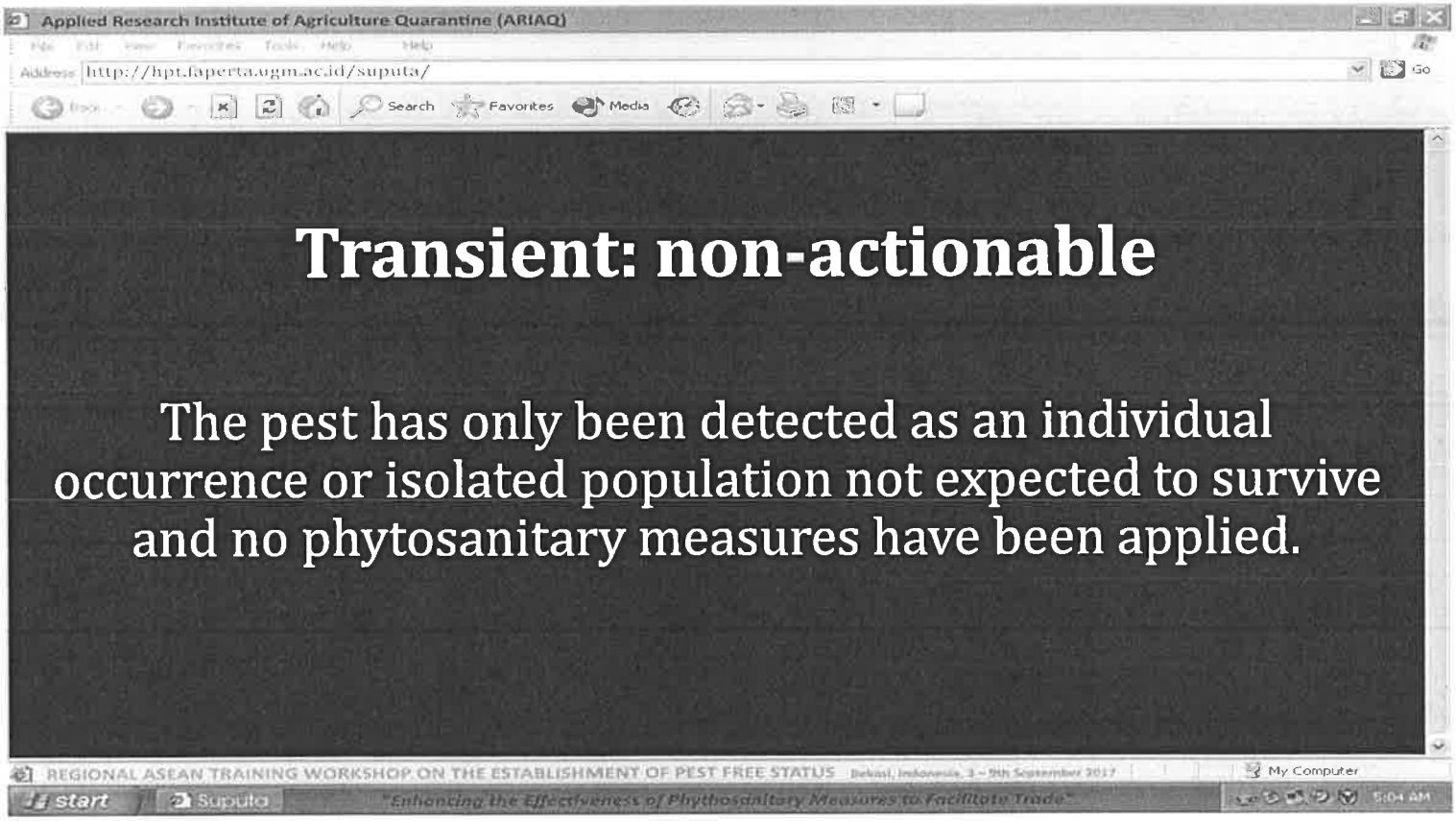
Applied Research Institute of Agriculture Quarantine (ARIAQ)
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Transient: non-actionable
The pest has only been detected as an individual occurrence or isolated population not expected to survive and no phytosanitary measures have been applied.
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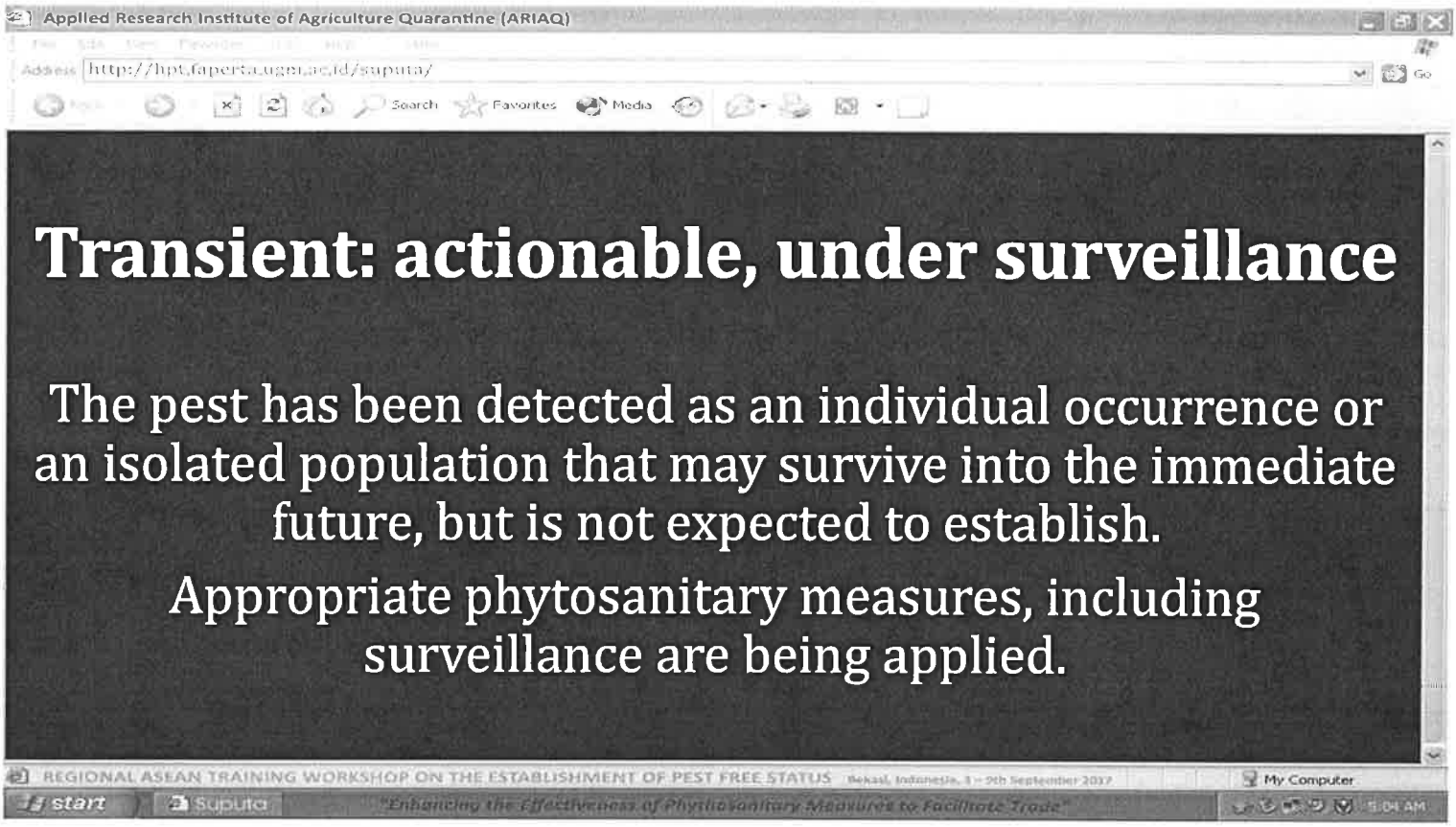
Applied Research Institute of Agriculture Quarantine (ARIAQ)
http://hpt.faperta.ugm.ac.id/suputa/
Transient: actionable, under surveillance
The pest has been detected as an individual occurrence or an isolated population that may survive into the immediate future, but is not expected to establish.
Appropriate phytosanitary measures, including surveillance are being applied.
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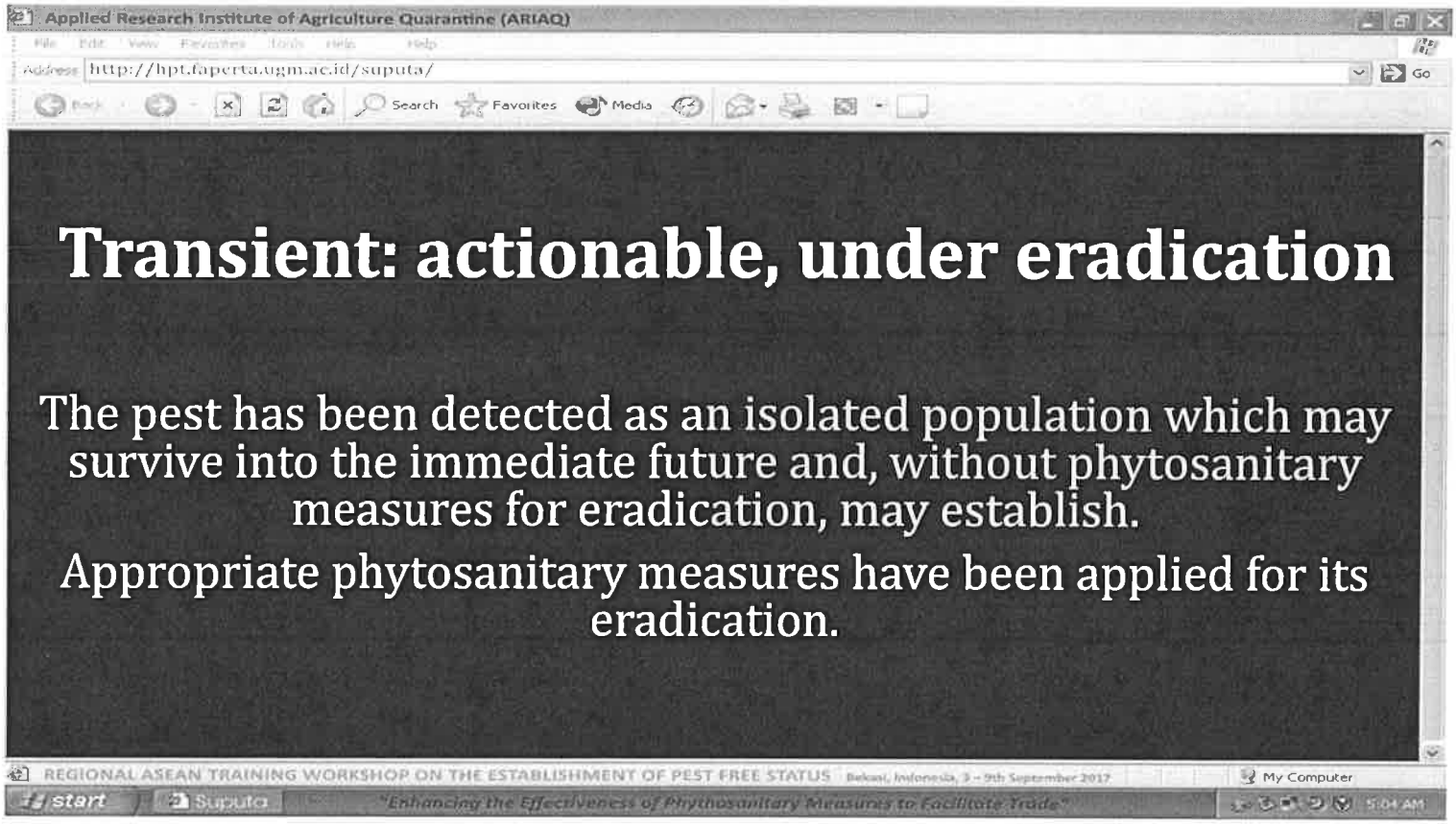
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Transient: actionable, under eradication
The pest has been detected as an isolated population which may survive into the immediate future and, without phytosanitary measures for eradication, may establish.
Appropriate phytosanitary measures have been applied for its eradication.
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Determination of pest status in an area

- individual pest records
- pest records from surveys
- records or other indication of pest absence
- results of general surveillance
- information from scientific publications and databases
- phytosanitary measures used to prevent introduction or spread
- other information relevant to assessing pest absence or presence

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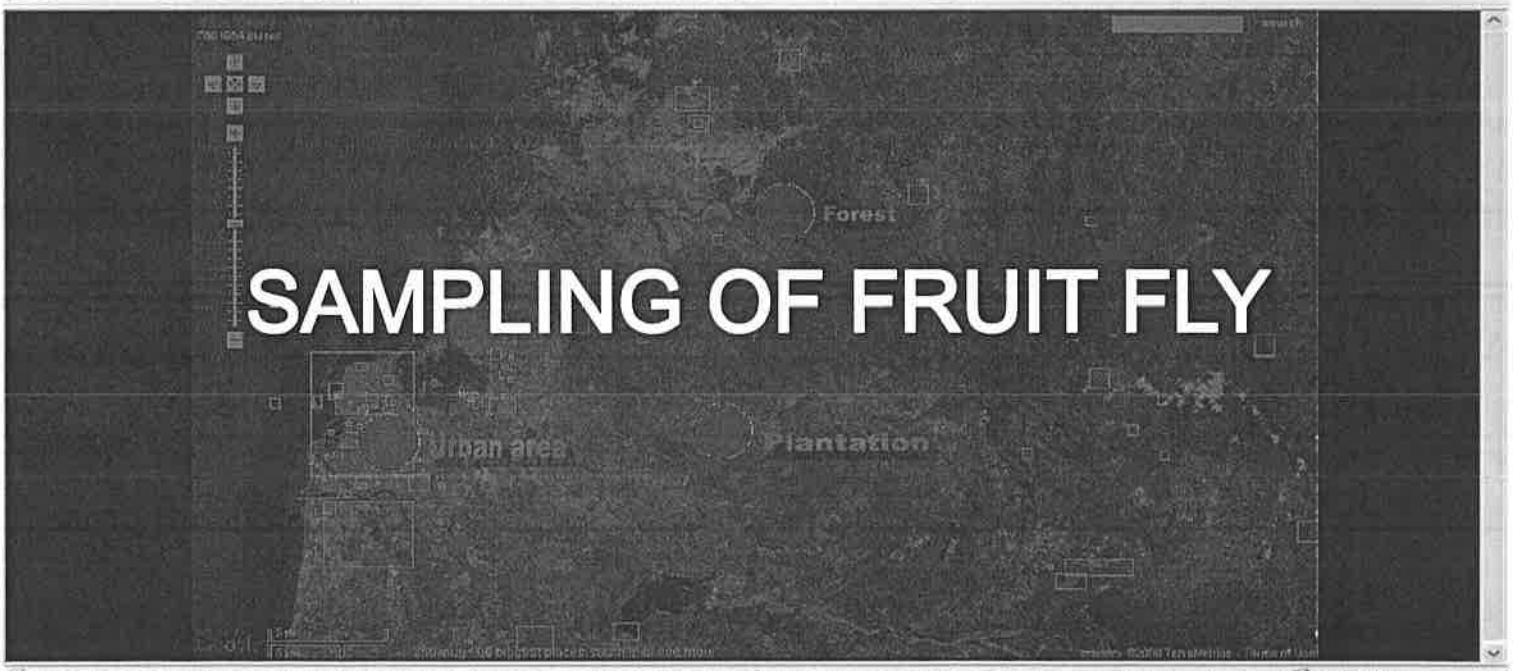

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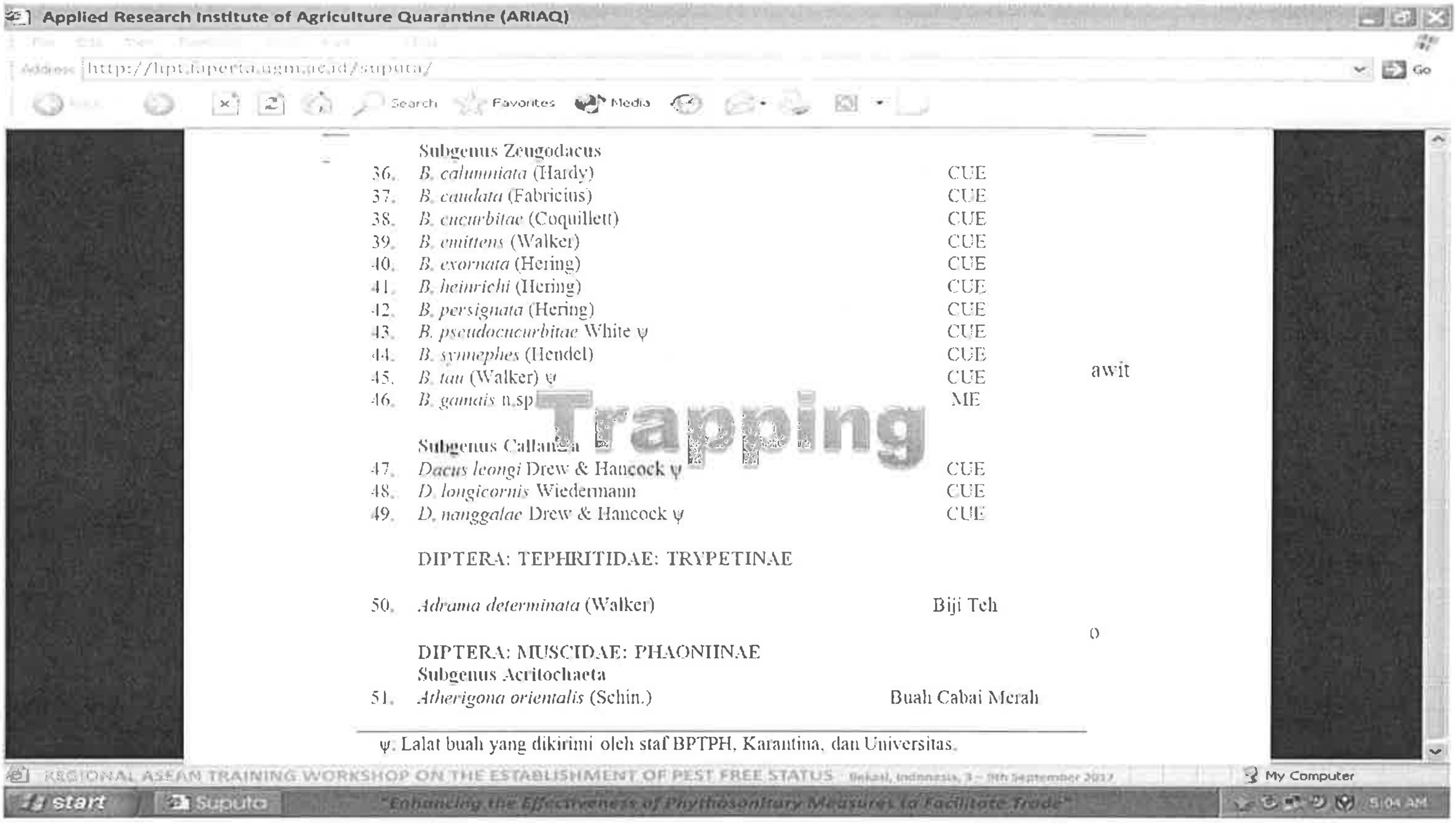

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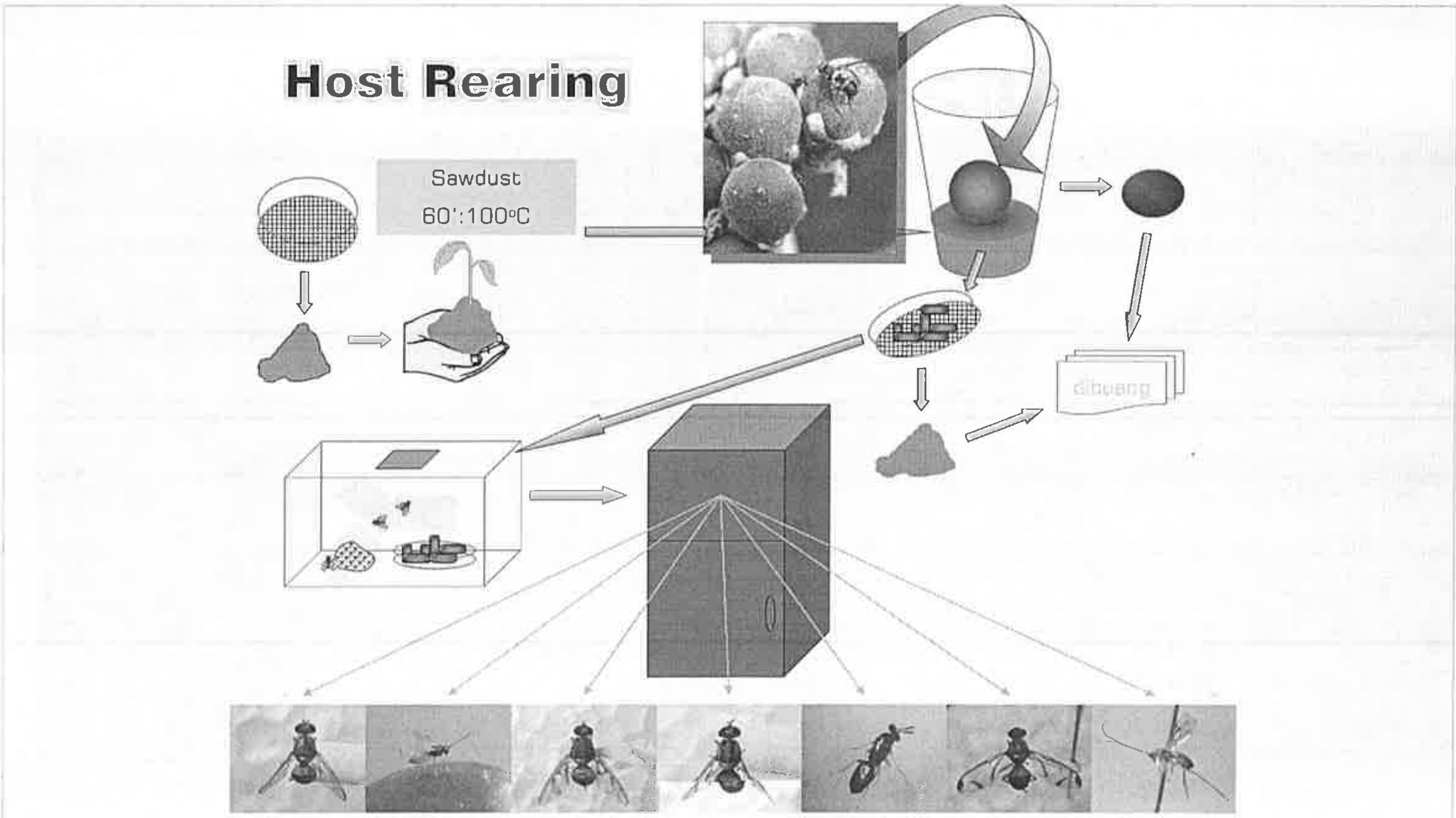
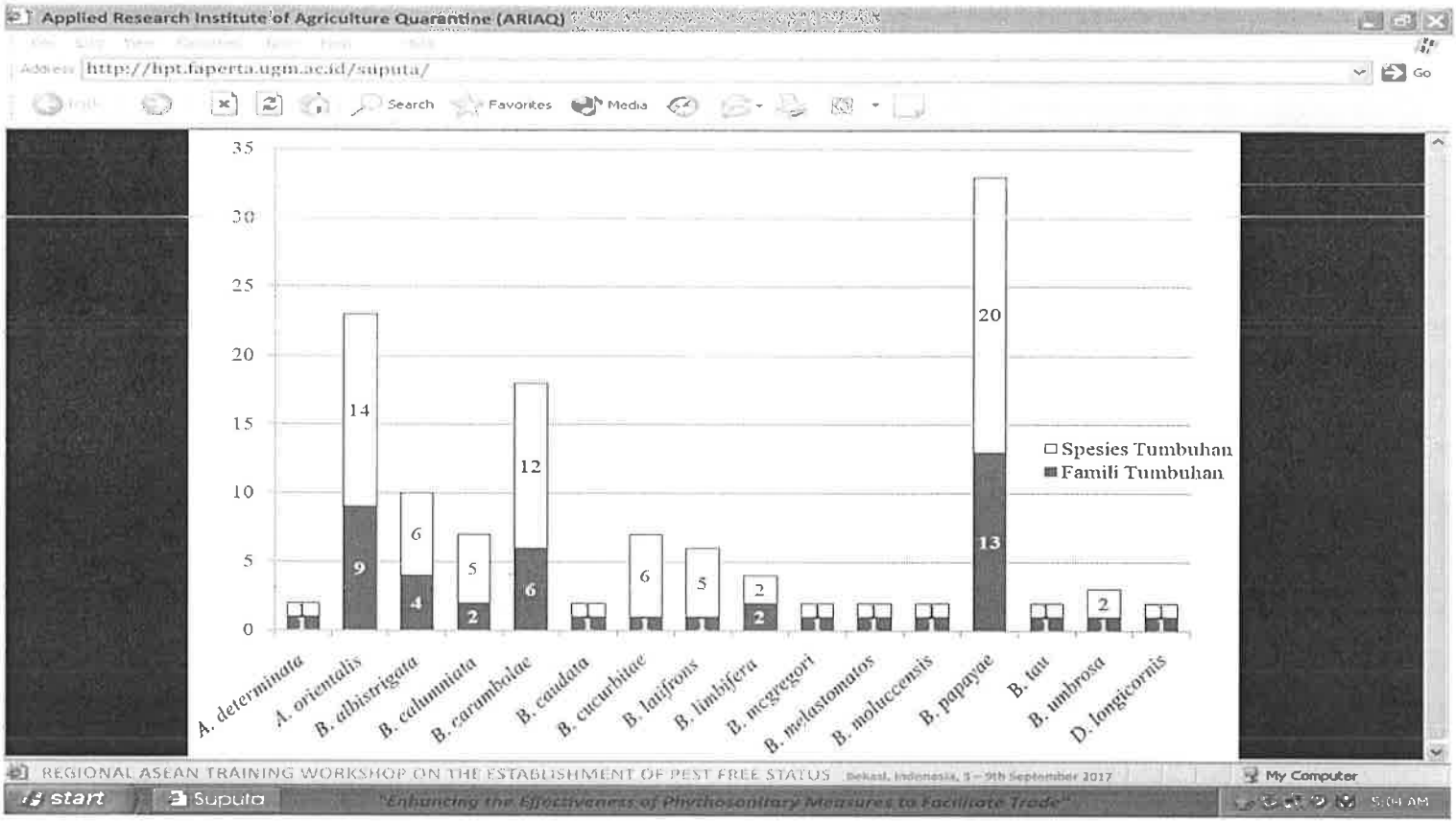
Trapping

	Subgenus Zeugodacus	
36.	*B. calumniata* (Hardy)	CUE
37.	*B. caudata* (Fabricius)	CUE
38.	*B. cucurbitae* (Coquillett)	CUE
39.	*B. emittens* (Walker)	CUE
40.	*B. exornata* (Hering)	CUE
41.	*B. heinrichi* (Hering)	CUE
42.	*B. persignata* (Hering)	CUE
43.	*B. pseudocucurbitae* White ψ	CUE
44.	*B. synnephes* (Hendel)	CUE
45.	*B. tau* (Walker) ψ	CUE
46.	*B. gamais* n.sp	ME
	Subgenus Callantra	
47.	*Dacus leongi* Drew & Hancock ψ	CUE
48.	*D. longicornis* Wiedermann	CUE
49.	*D. nanggalae* Drew & Hancock ψ	CUE
	DIPTERA: TEPHRITIDAE: TRYPETINAE	
50.	*Adrama determinata* (Walker)	Biji Teh
	DIPTERA: MUSCIDAE: PHAONIINAE	
	Subgenus Acritochaeta	
51.	*Atherigona orientalis* (Schin.)	Buah Cabai Merah

ψ: Lalat buah yang dikirimi oleh staf BPTPH, Karantina, dan Universitas.

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35
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6
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12
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2
20
13
2
Spesies Tumbuhan
Famili Tumbuhan
A. determinata
A. orientalis
B. albistrigata
B. calunniata
B. carambolae
B. caudata
B. cucurbitae
B. latifrons
B. limbifera
B. mcgregori
B. melastomatos
B. moluccensis
B. papayae
B. tau
B. umbrosa
D. longicornis
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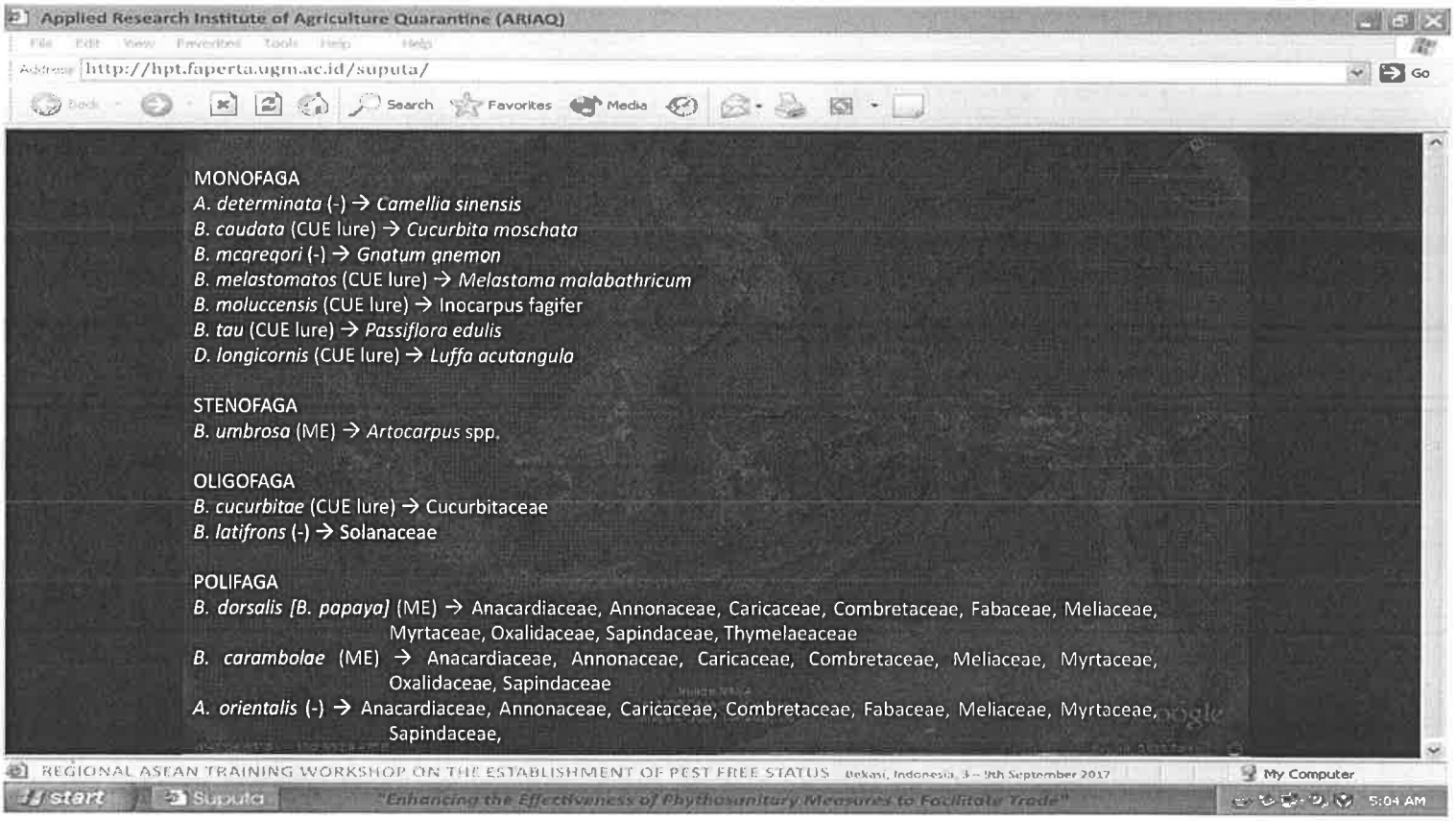
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MONOFAGA
A. determinata (-) → Camellia sinensis
B. caudata (CUE lure) → Cucurbita moschata
B. mcgregori (-) → Gnatum gnemon
B. melastomatos (CUE lure) → Melastoma malabathricum
B. moluccensis (CUE lure) → Inocarpus fagifer
B. tau (CUE lure) → Passiflora edulis
D. longicornis (CUE lure) → Luffa acutangula
STENOFAGA
B. umbrosa (ME) → Artocarpus spp.
OLIGOFAGA
B. cucurbitae (CUE lure) → Cucurbitaceae
B. latifrons (-) → Solanaceae
POLIFAGA
B. dorsalis [B. papaya] (ME) → Anacardiaceae, Annonaceae, Caricaceae, Combretaceae, Fabaceae, Meliaceae, Myrtaceae, Oxalidaceae, Sapindaceae, Thymelaeaceae
B. carambolae (ME) → Anacardiaceae, Annonaceae, Caricaceae, Combretaceae, Meliaceae, Myrtaceae, Oxalidaceae, Sapindaceae
A. orientalis (-) → Anacardiaceae, Annonaceae, Caricaceae, Combretaceae, Fabaceae, Meliaceae, Myrtaceae, Sapindaceae,
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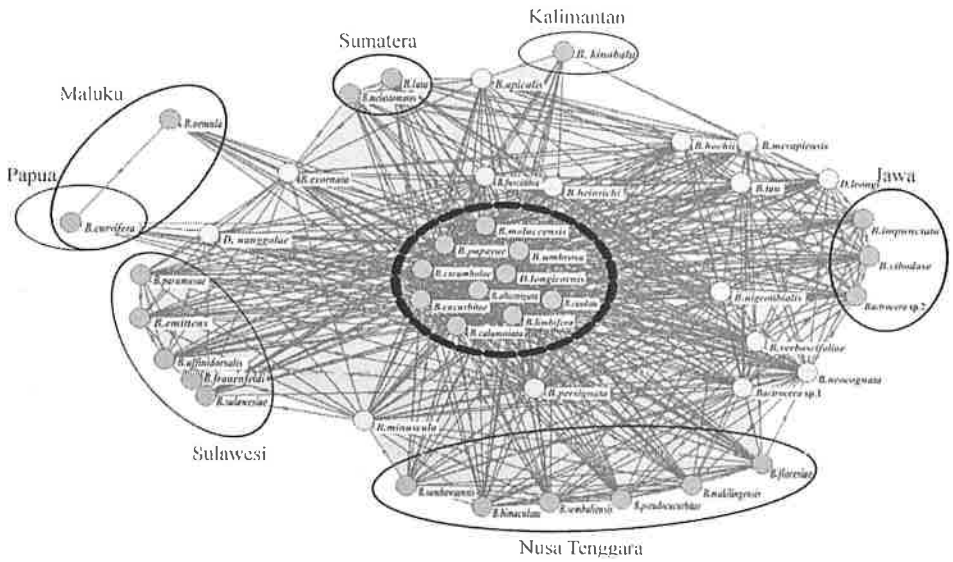

Gambar 8. Pengelompokan sebaran lalat buah menggunakan *Pajek software package*; ● endemik, ● kosmopolit, dan ○ semi-kosmopolit.

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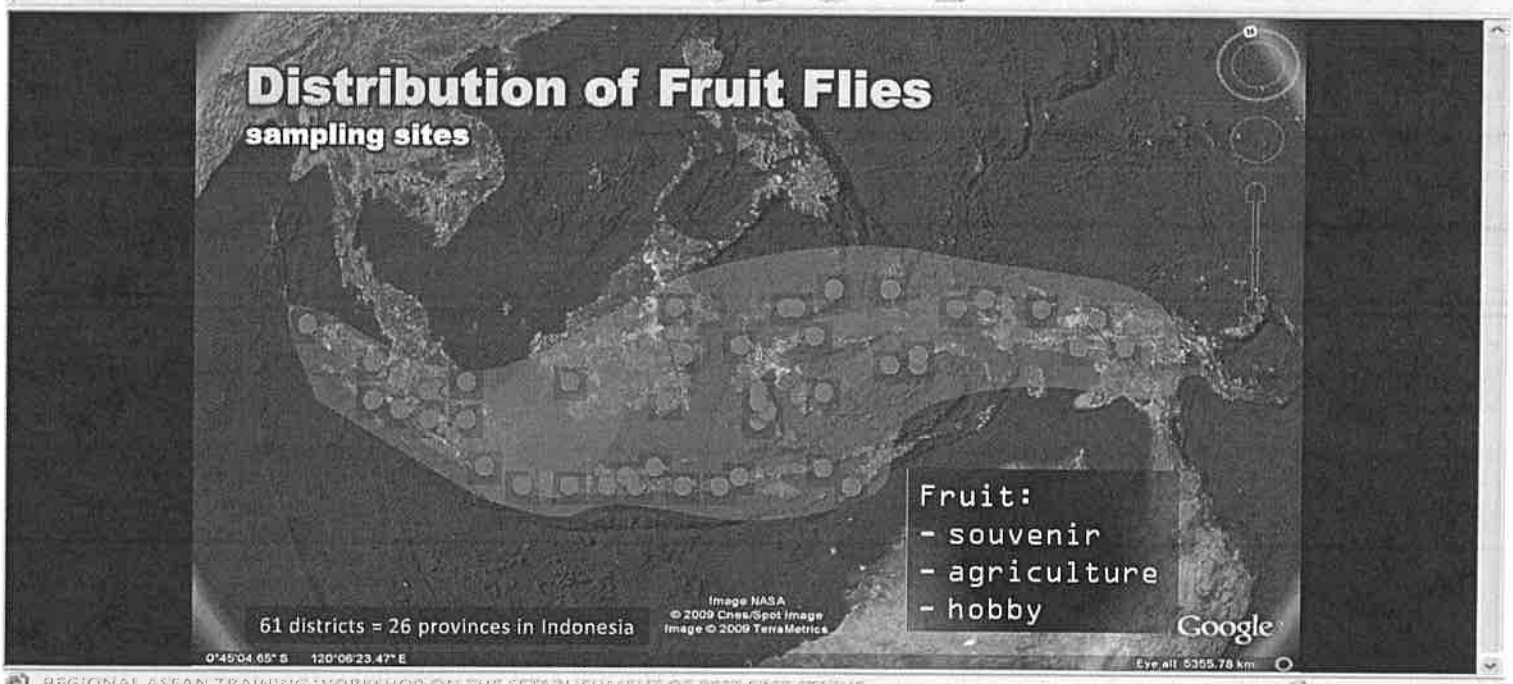

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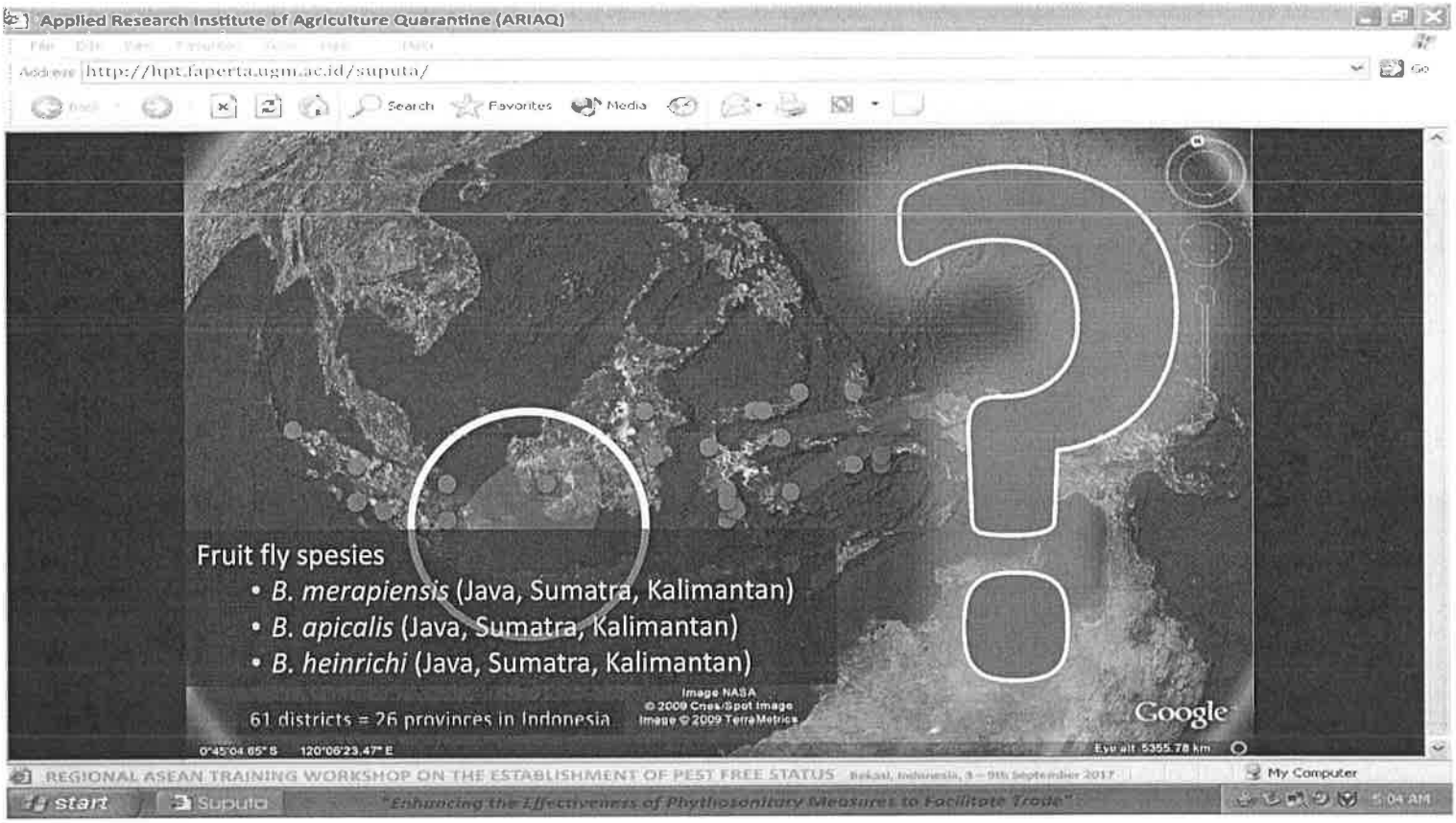
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Fruit fly spesies
• B. merapiensis (Java, Sumatra, Kalimantan)
• B. apicalis (Java, Sumatra, Kalimantan)
• B. heinrichi (Java, Sumatra, Kalimantan)
61 districts = 26 provinces in Indonesia
Image NASA
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Image © 2009 TerraMetrics
Google
Eye alt 5355.78 km
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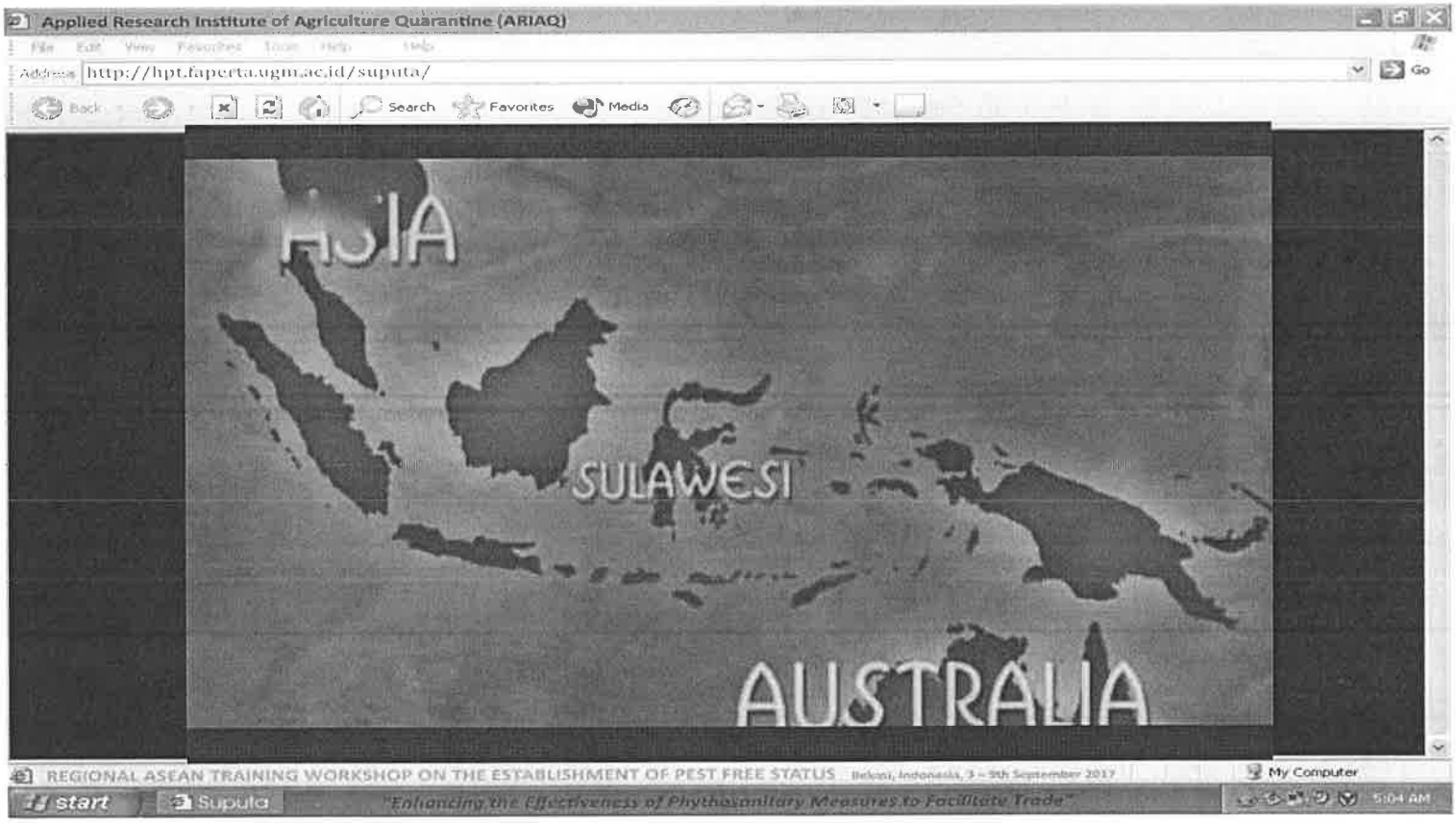
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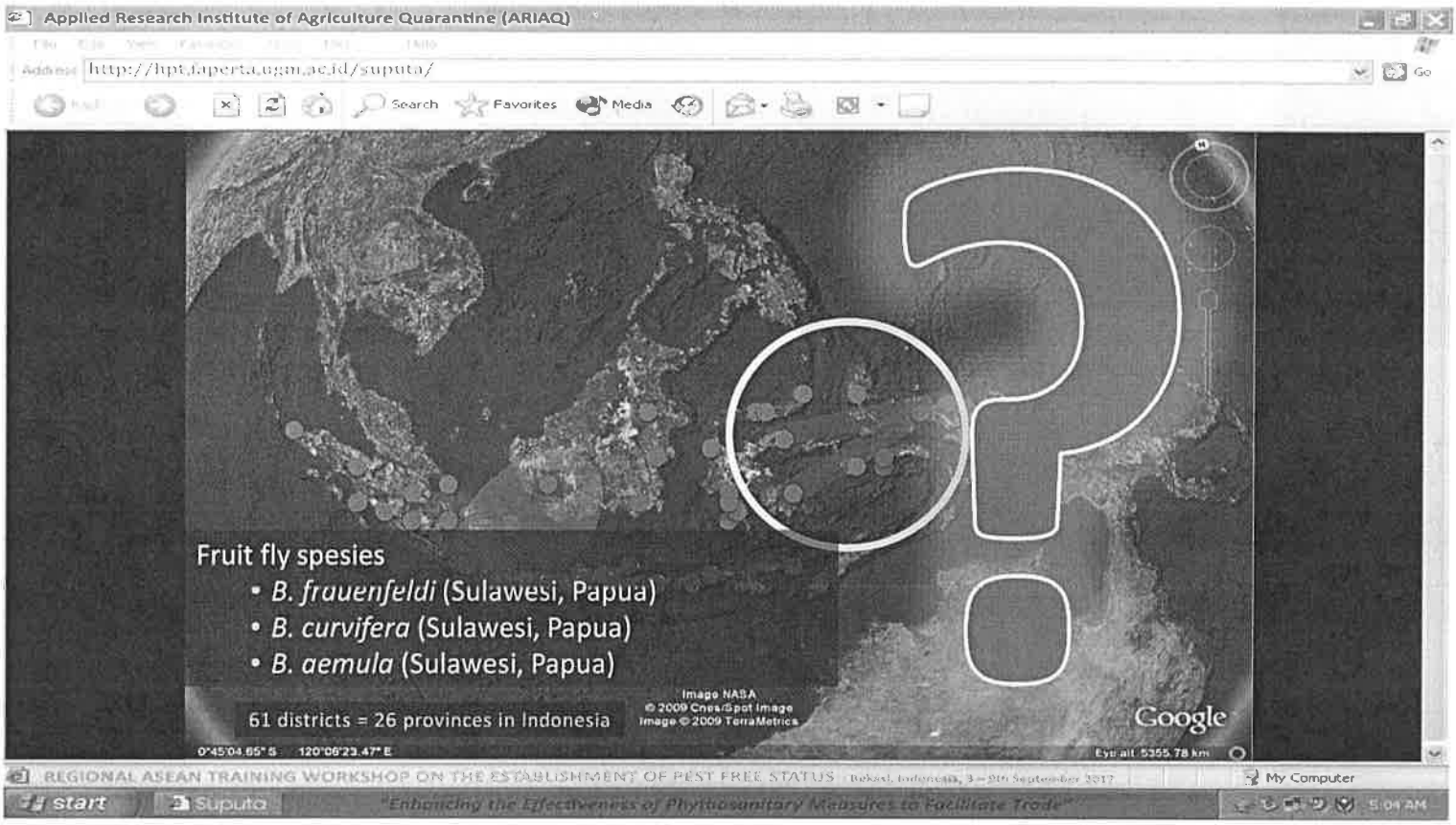
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Search
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Media
Fruit fly spesies
• B. frauenfeldi (Sulawesi, Papua)
• B. curvifera (Sulawesi, Papua)
• B. aemula (Sulawesi, Papua)
61 districts = 26 provinces in Indonesia
Image NASA
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Google
Eye alt 5355.78 km
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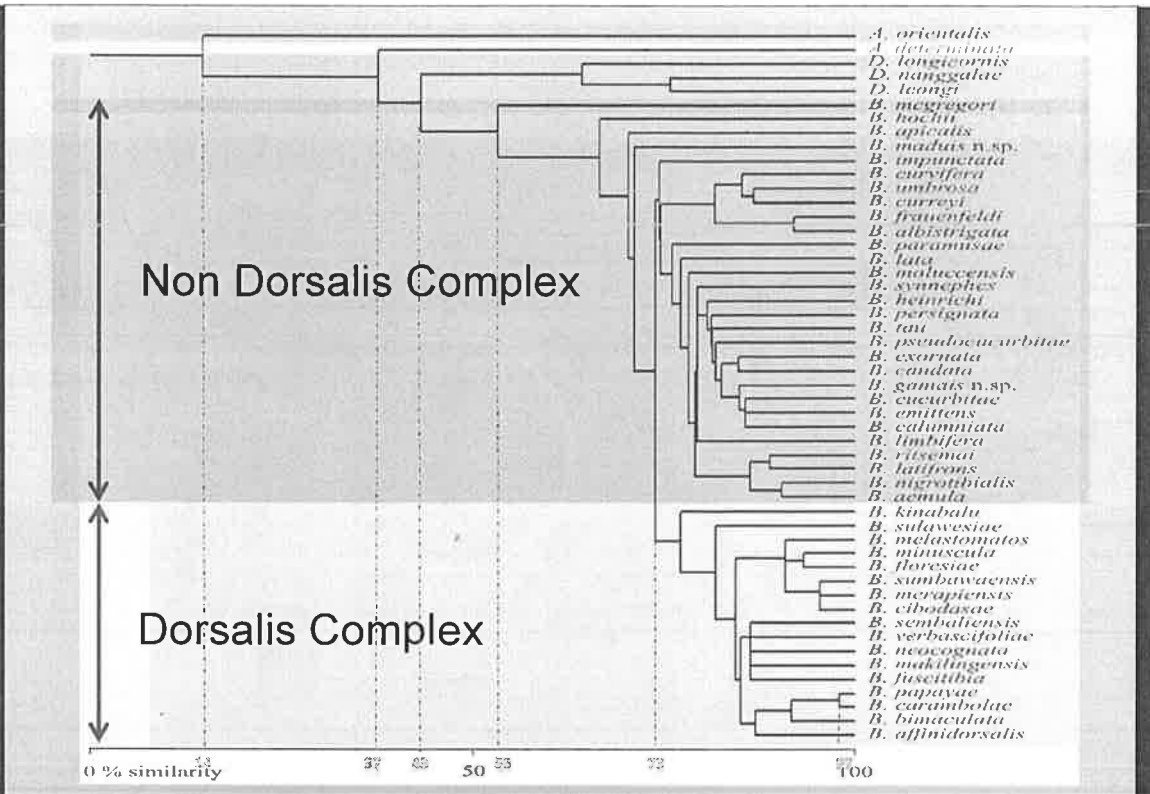

Bray-Curtis Cluster Analysis.