PEST SURVEILLANCE TO DETERMINE PEST FREE AREAS AND AREAS OF LOW PEST PREVALENCE FOR TEPHRITIDAE SPECIES IN SOUTH AFRICA

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Photo JH Venter

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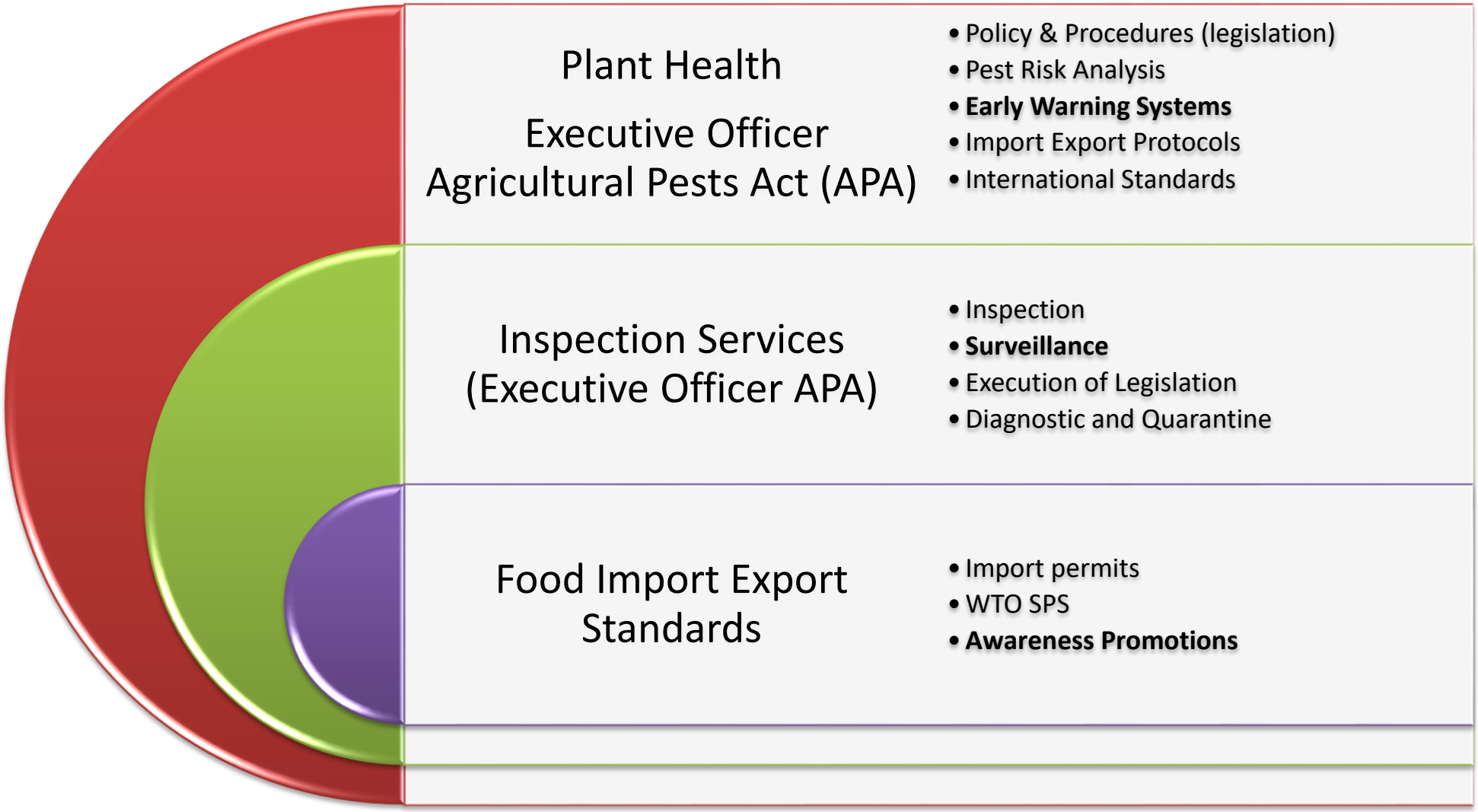
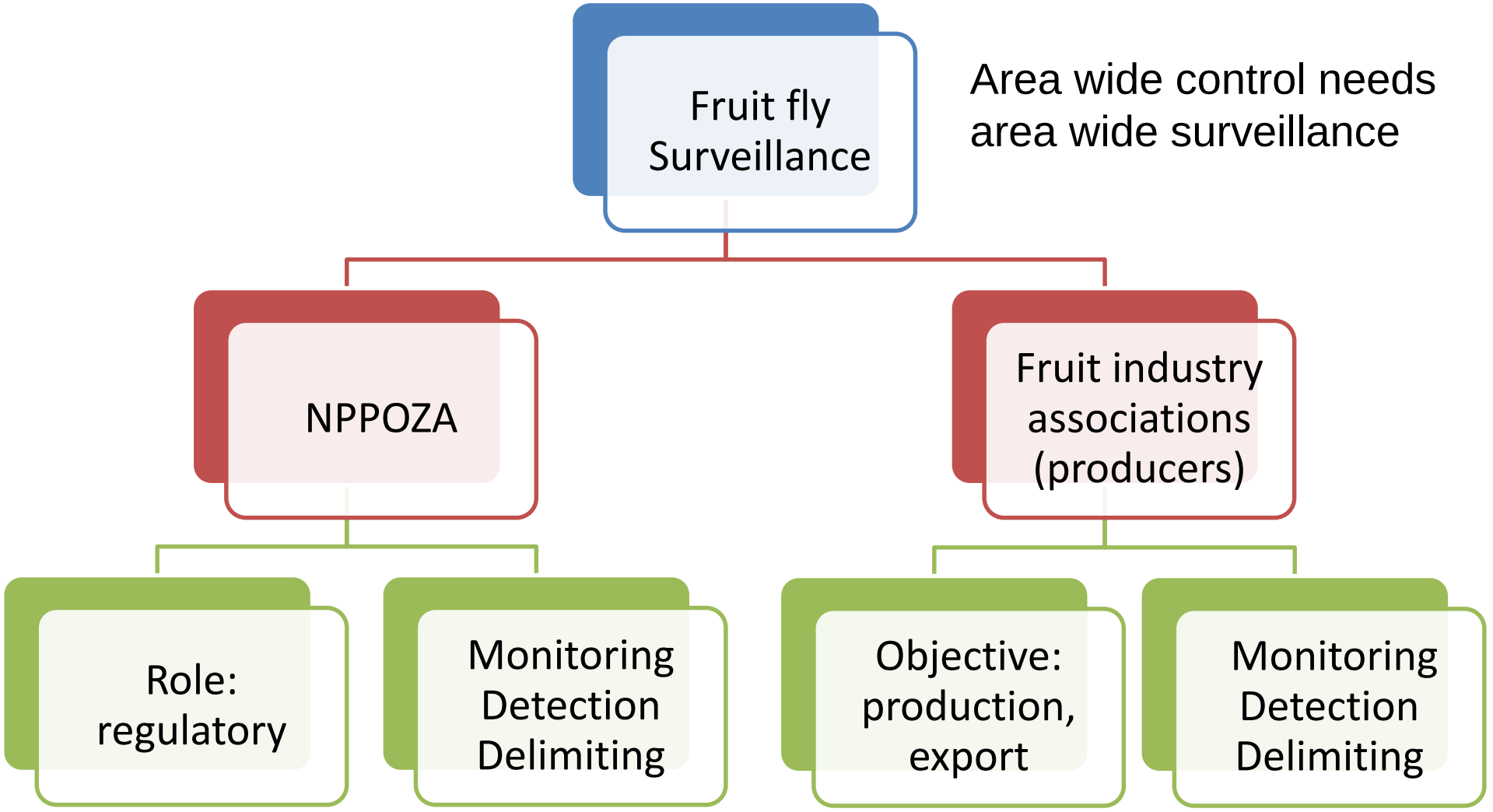
Surveillance, fruit, trade and fruit flies

- Surveillance programmes determines if a pest is present in an area, the extent of its presence and its seasonal activity
- South Africa exports fresh fruit to the value of US$3 billion
- Economically important pests in South Africa include:
  - Oriental Fruit fly (*Bactrocera dorsalis*)
  - Mediterranean fruit fly (*Ceratitis capitata*)
- Quarantine pests - trading partners
- Strict phytosanitary measures to export
- A systems approach - surveillance

National Plant Protection Organisation of South Africa (NPPOZA)



NPPOZA and Fruit industry integrated surveillance



Medfly Sterile Insect Technique (SIT) project

- 50/50 partnership between DALRRD and deciduous fruit industry since 2009
- NPPOZA play a supervisory role
- An area wide integrated pest management program (AWIPM)
- Includes SIT, area wide protein baiting and sanitation
- Sterile fruit fly released over 15,000 ha of fruit
- Key to the project is area wide surveillance

STERIELE INSEK TEGNIEK
FRUITFLY AFRICA
STERILE INSECT TECHNIQUE

Photo: JH Venter

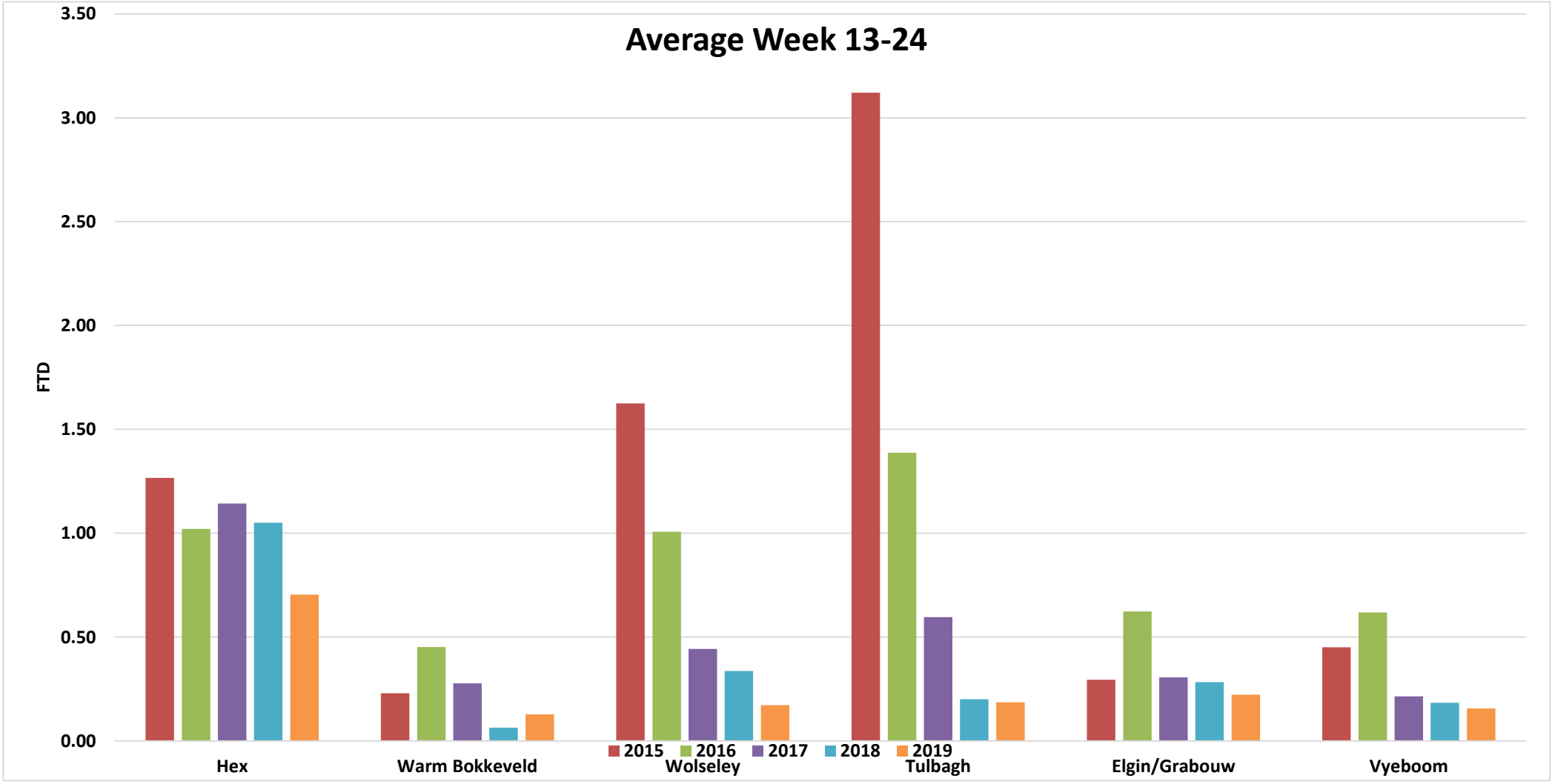
Surveillance to monitor Medfly

- Industry use Fruit Fly Africa as a service provider
- Chempac® bucket traps
- Three-component protein lure (Biolure)
- Trimed lure for wild male detection
- Deployed at a density of 1 trap per 20 ha
- Serviced weekly
- Most activities in Oriental fruit fly (OFF) free areas
- Also set Methyl Eugenol (ME) traps for early detection of OFF

Medfly monitoring successes

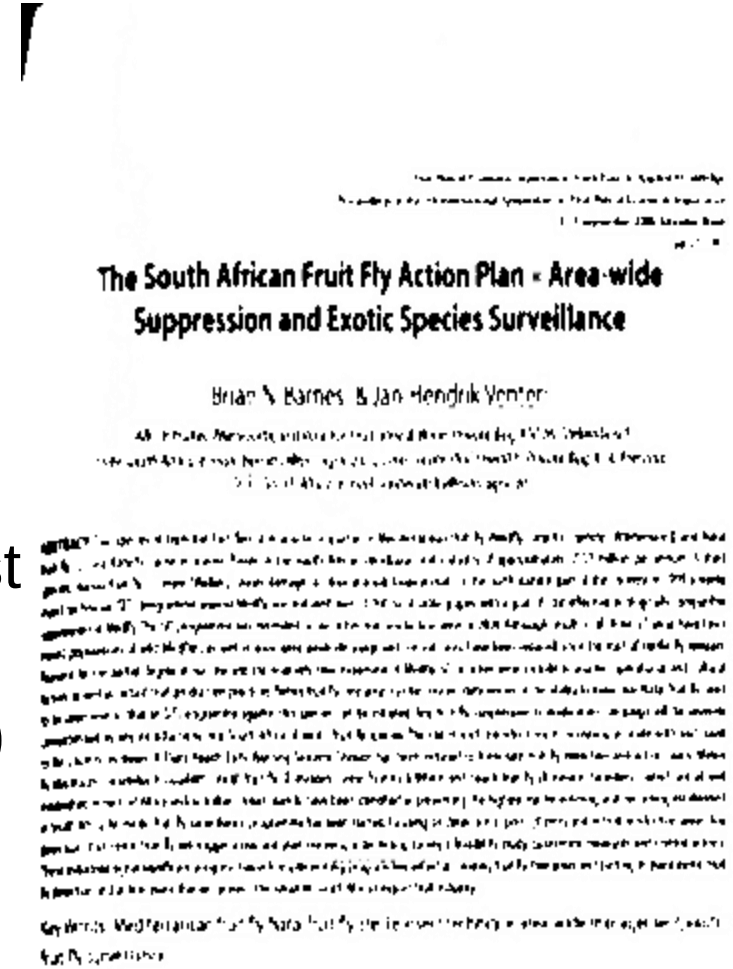
- The AWIPM programme has reduced Medfly populations by 73%
- This is determined by continuous fruit fly surveillance in all the production areas, border areas and house gardens
- The surveillance cost for 15,000ha is US$ 600 000/year
- 1000 sterile males/ha released
- No commercial deciduous fruit interceptions in sensitive markets with no post harvest treatment

Medfly numbers between 2015 and 2019 in SIT areas



National exotic fruit fly surveillance program

- Since 2006
- Early detection of exotic fruit flies
- +/-1500 traps, serviced 1/month
- Methyl Eugenol and Biolure traps
- The Strategic plan of DALRRD
- An early warning system against exotic fruit flies such as:
  - *Bactrocera dorsalis* (Oriental fruit fly)
  - *B. zonata* (Peach fruit fly)
  - *Zeugodacus cucurbitae* (Melon fly)



The South African Fruit Fly Action Plan - Area-wide Suppression and Exotic Species Surveillance

Barnes B. N. & Venter J-H (2008) in Proceedings of the 7th International Symposium on fruit flies of economic importance, September 2006.

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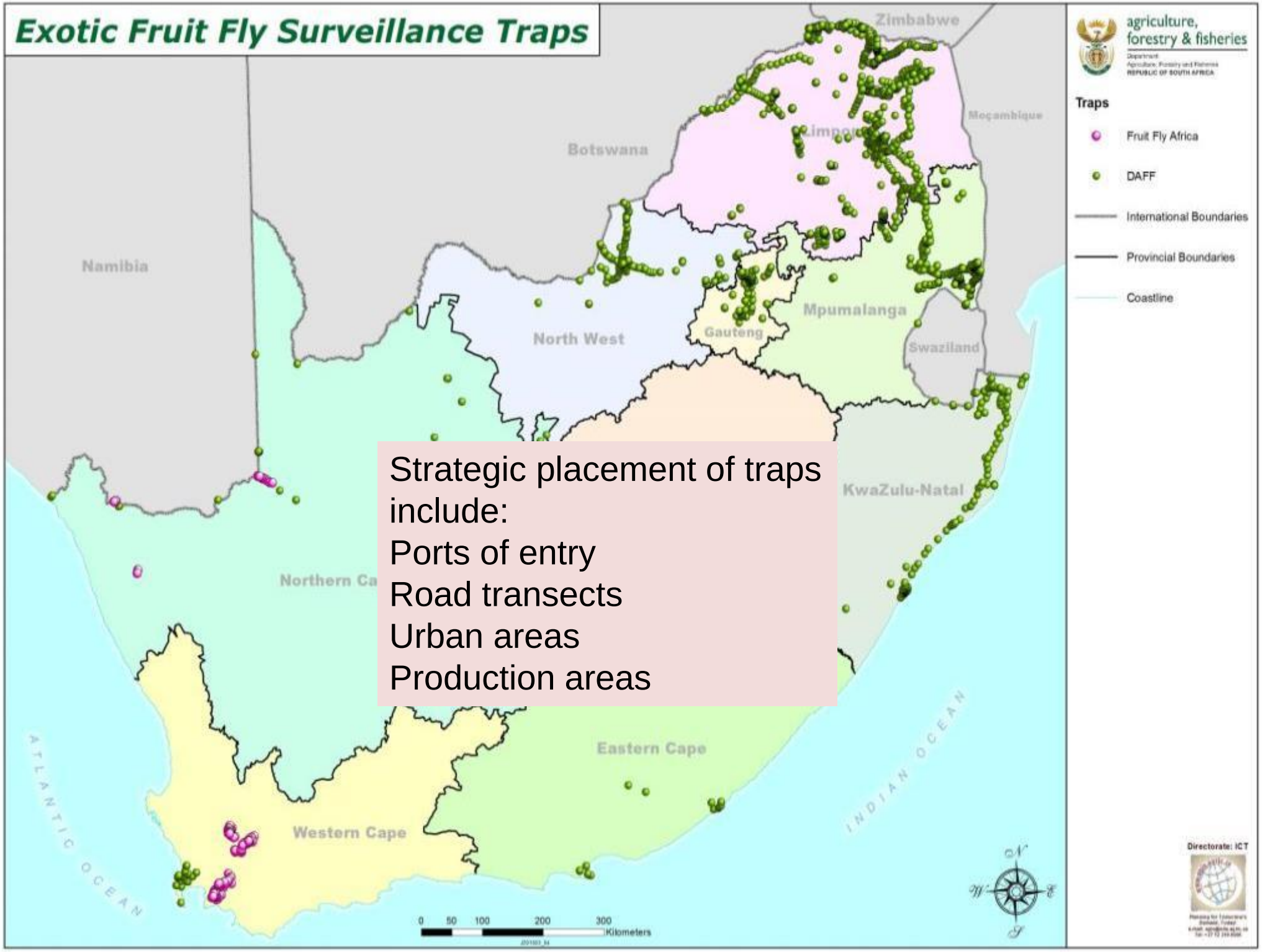


Strategic placement of traps include:

Ports of entry

Road transects

Urban areas

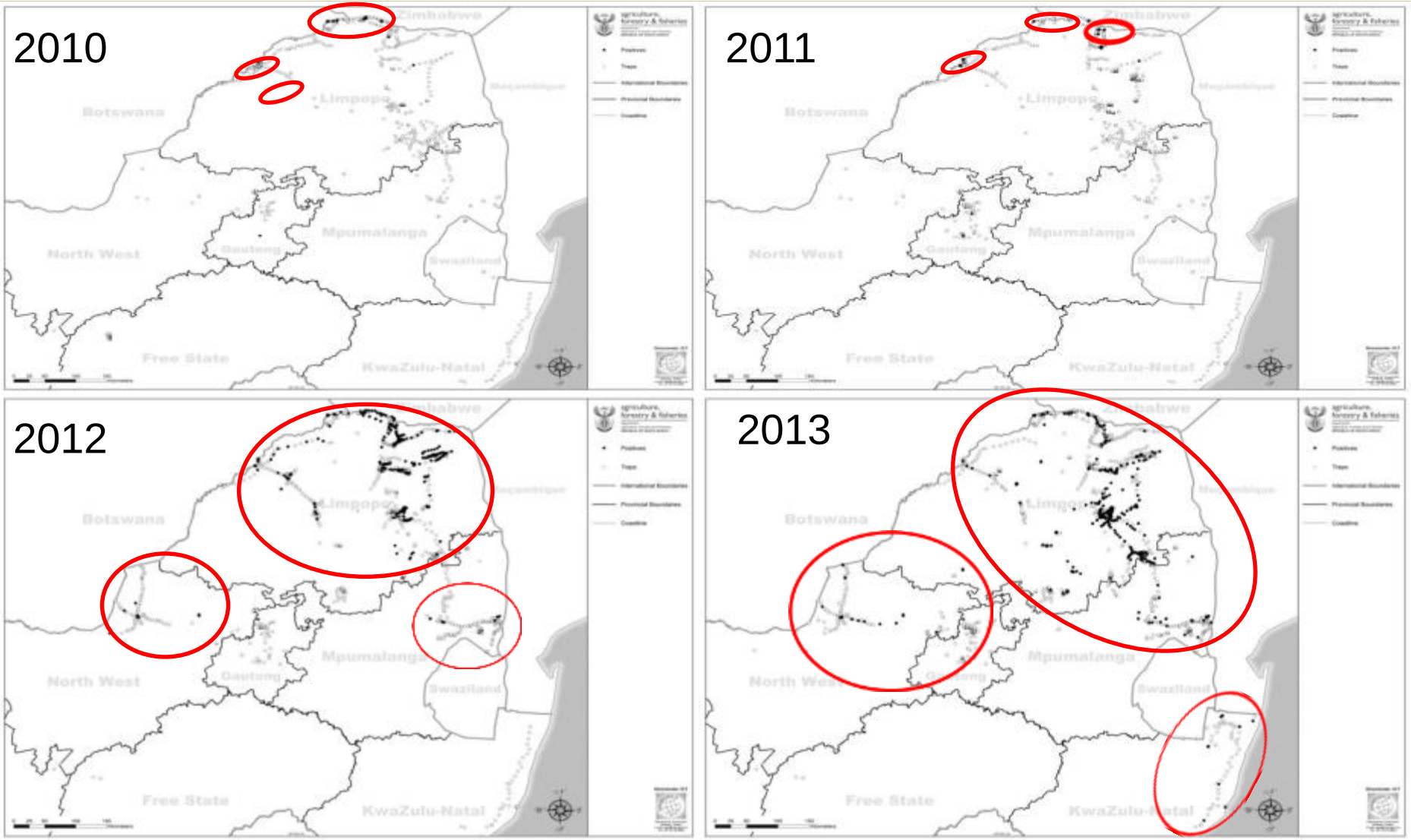
Production areas

Bactrocera dorsalis

- First outbreak in 2010 in South Africa
- Successfully eradicated in 2010 and again in 2011
- The pest established in the northern and eastern parts of South Africa by 2013
- The Eastern, Western and Northern Cape and Free State provinces are free from the pest except for occasional outbreaks which triggers delimiting and eradication actions
- Its wide host range, with a high fecundity makes this pest a very successful invader


Photo: JH Venter

Bactrocera dorsalis detections, 2010 - 2013



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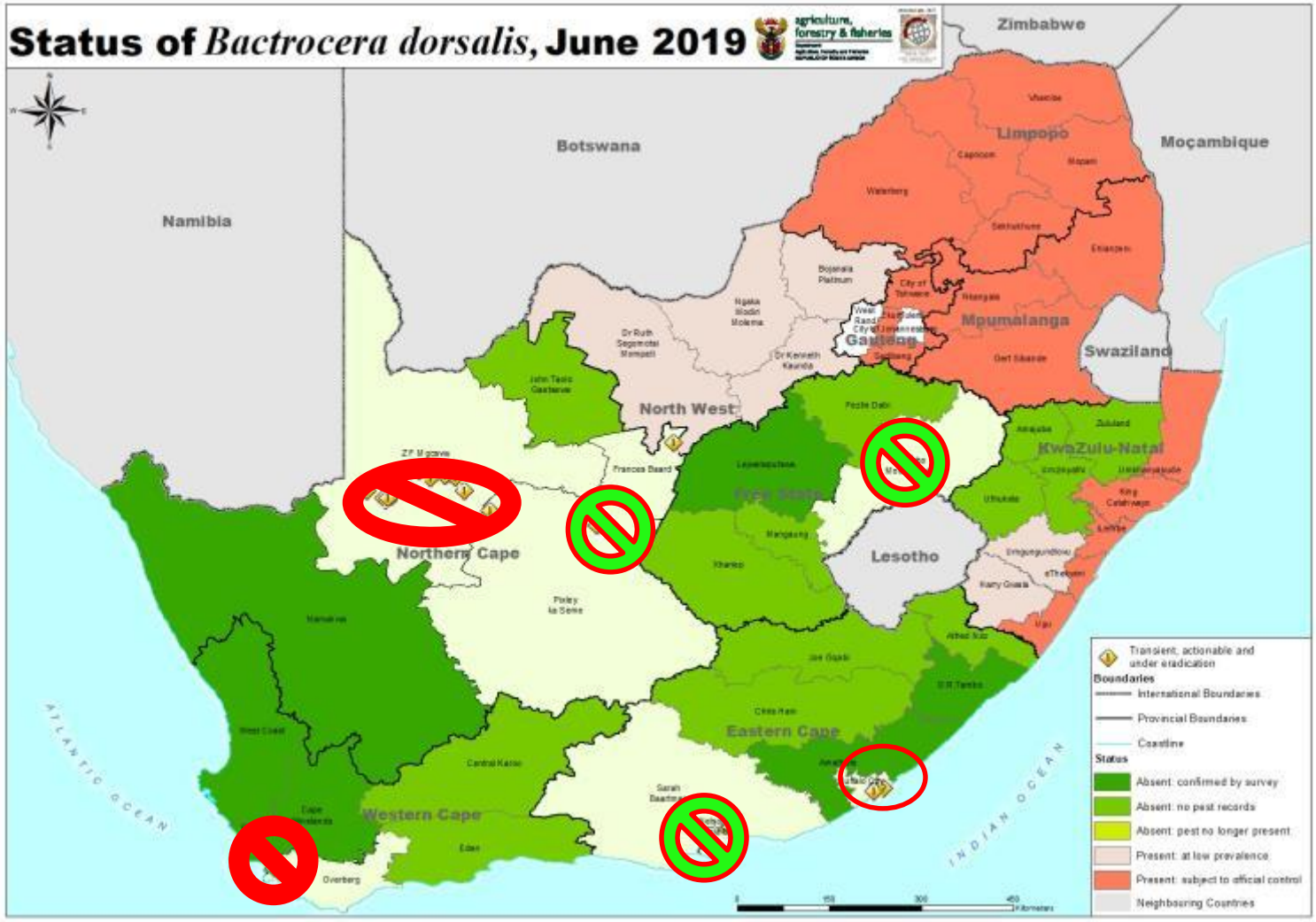
Spread in South Africa

- Natural within low altitude high humidity and high fruit production areas
- Such as Vhembe and Mopani districts in Limpopo
- Informal trade
- Informal fresh produce markets
- Hawker stalls
- Public
- By maintaining suppression the spread was minimised towards the South

Photo: JH Venter

Status of OFF in South Africa



ISPM 8 and 17
Status: Present in some areas and subject to official control

Areas free of OFF are published in R110 of the Agricultural Pests Act 1983 (Act No. 36 of 1983)

Major hosts

Polyphagous

Over 260 fruit hosts which includes, pome, stone, table grapes, citrus, cucurbits, and wild hosts.

Primary hosts:

- Mango
- Guava

ISPM 37 Non hosts:

- Green lemon and green banana
- Some harvest ready papaya and avocado cultivars

Control of *B. dorsalis*

- High numbers lead to production and market losses
  - Effects local agricultural development especially small scale farmers
  - Presence and interceptions lead to export market loss
  - Is a quarantine pest for: EU, USA, Japan, Botswana, Mauritius, Mexico etc.

- The EU implemented new regulations for non European Tephritidae species (fruit flies) from 1 September 2019, affecting South Africa's fresh fruit exports of citrus, stone fruit and mango.

South African *Bactrocera invadens* Fruit Fly (SABIFF) action plan (*Bactrocera dorsalis*)

1. Surveillance
2. Delimiting surveys
3. Orchard and field sanitation
4. Bait application
5. Male annihilation
6. Removal control
7. Compliance auditing

Flies per trap per day (FTD)

- Removal from infested areas to pest free areas is only allowed from production areas where the fruit fly populations are kept low
- Producers must implement additional phytosanitary actions if levels exceed10 flies per trap per month in a production area, or an FTD of 0.33 is exceed.

$$FTD = F/ T \times D$$

ISPM 26

Establishment of Pest Free Areas for Fruit Flies (Tephritidae)

2.4.1 Suspension

The status of the FF-PFA or the affected part within the FF-PFA should be suspended when an outbreak of the target fruit fly occurs or based on one of the following triggers:

detection of an **immature** specimen of the target fruit fly,

two or more fertile adults as demonstrated by scientific evidence,

or **an inseminated female** within a defined period and distance.

Suspension may also be applied if procedures are found to be faulty.

ISPM 35

Systems approach for pest risk management of

fruit flies (Tephritidae)

2. Development of a fruit fly systems approach (FF-SA)

- Measures may be applied at various stages from production of fruit within the exporting country to distribution within the importing country.

production to distribution

ANNEX 1: Establishment of areas of low pest prevalence for fruit flies

- used for export purposes, usually in conjunction with other risk mitigation measures as a component of an fruit fly systems approach

Conclusion

- Monitoring provides data for producers to make management decisions at the production unit
- Early detection of new pests ensures quick implementation of corrective actions
- The integration of surveillance with stakeholders has had a positive result in managing areas free of OFF in South Africa
- It also provides data to determine if areas of low pest prevalence would be feasible (Medfly)
- The development of areas of low pest prevalence and pest free areas may be used as export mitigation strategies in a systems approach

CONTACT DETAILS

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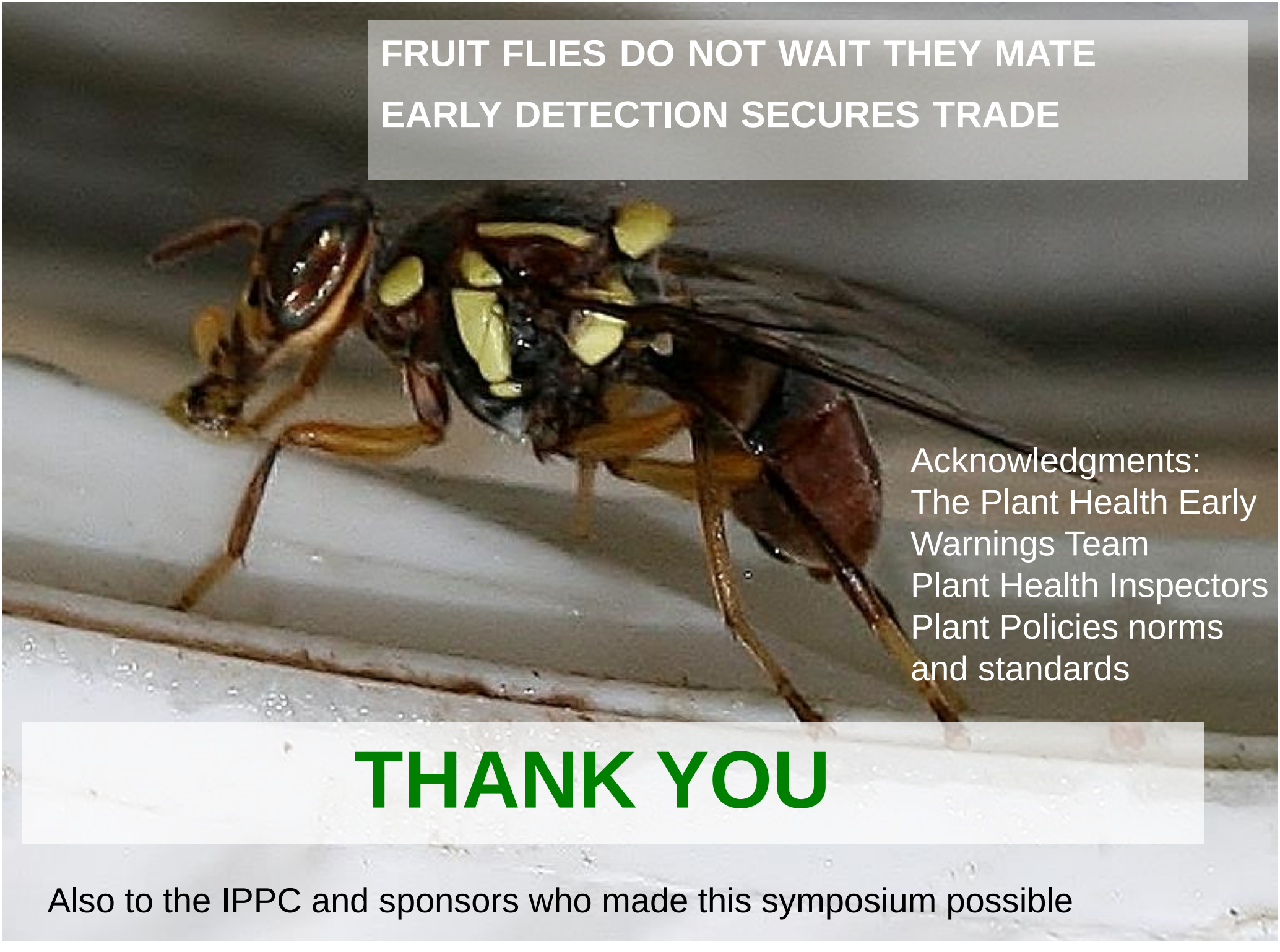

FRUIT FLIES DO NOT WAIT THEY MATE

EARLY DETECTION SECURES TRADE

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Plant Policies norms and standards

THANK YOU

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