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AREA WIDE SUPPRESSION OF *BACTROCERA* FRUIT FLIES IN DRAGON FRUIT IN VIETNAM

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Dragon fruit production in Binh thuan province

- ✓ Located in Southern of Viet Nam
- ✓ Two season (Dry and Wet)

✓ Over 29.000 ha of dragon fruit; 7 - 9 crops/year; 59.000 tons of yield

✓ About 80% of dragon fruit production has been exported

✓ Thousands of families, 23 co-operatives and 2 unions





Major Disease and Pests damaged Dragon fruit



(Photo credit: Kyung San Cho)



Xanthomonas campestris ; *Enterobacter* sp.
(Photo credit: Ngoc N.T.B)



(Photo credit: Hien NTT)



Brown Spot Disease (*Neoscytalidium dimidiatum*)
(Photo credit: Khai L.Q.)

Fruit Flies & International market

Oriental Fruit Fly Eradication in Florida 2015–2016 Program Implementation, Unique Aspects, and Lessons Learned

Gary J Steck ✉, Abbie J Fox, Daniel Carrillo, David Dean, Amy Roda, Nancy D Epsky, Trevor R Smith

American Entomologist, Volume 65, Issue 2, Summer 2019, Pages 108–121, <https://doi.org/10.1093/ae/tmz023>

Published: 07 June 2019

Morocco Sets up Pest Surveillance Network in Preparation for the Suppression of the Mediterranean Fruit Fly

13 Jun 2019
Miklos Gaspar, IAEA Office of Public Information and Communication



Invasive fruit fly species including the Oriental Fruit Fly (*Bactrocera dorsalis*, Hendel), are threatening Morocco's economy. (Photo: A. Rodriguez)

Taiwan to begin importing mangosteen fruit from Thailand

A ban on the fruit has been in effect for over a decade due to problems with fruit flies

The import of mangosteen fruit to Taiwan has been suspended since 2003 due to the spread of fruit flies, *Bactrocera carambolae* and *Bactrocera papayae*, in the fruit which are prevalent in Southeast Asia.

The European Union (EU) began strict phytosanitary inspections on agricultural imports. Fresh citrus fruits and mangoes, must be planted in certified orchards, and must not be affected by oriental fruit flies.

<https://en.vietnamplus.vn/eu-enhances-inspections-on-vietnams-agricultural-products-from-sept-1/159835.vnp>



EN.VIETNAMPLUS.VN

EU enhances inspections on Vietnam's agricultural products fro...



Fruit fly (Diptera: Tephritidae) are among the top threats

Fruit fly control in Viet Nam

Pre-harvest

Post-harvest

IPM model



Wrapping



Sanitation



Attractance lure



Bait protein spraying



Radiation



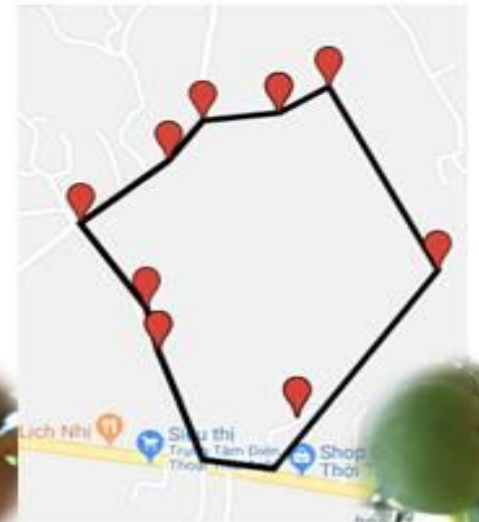
Vapor Heat Treatment

Fruit fly management programmes in Viet Nam

Before 2004: Small areas



Since 2005: Large areas



Peach



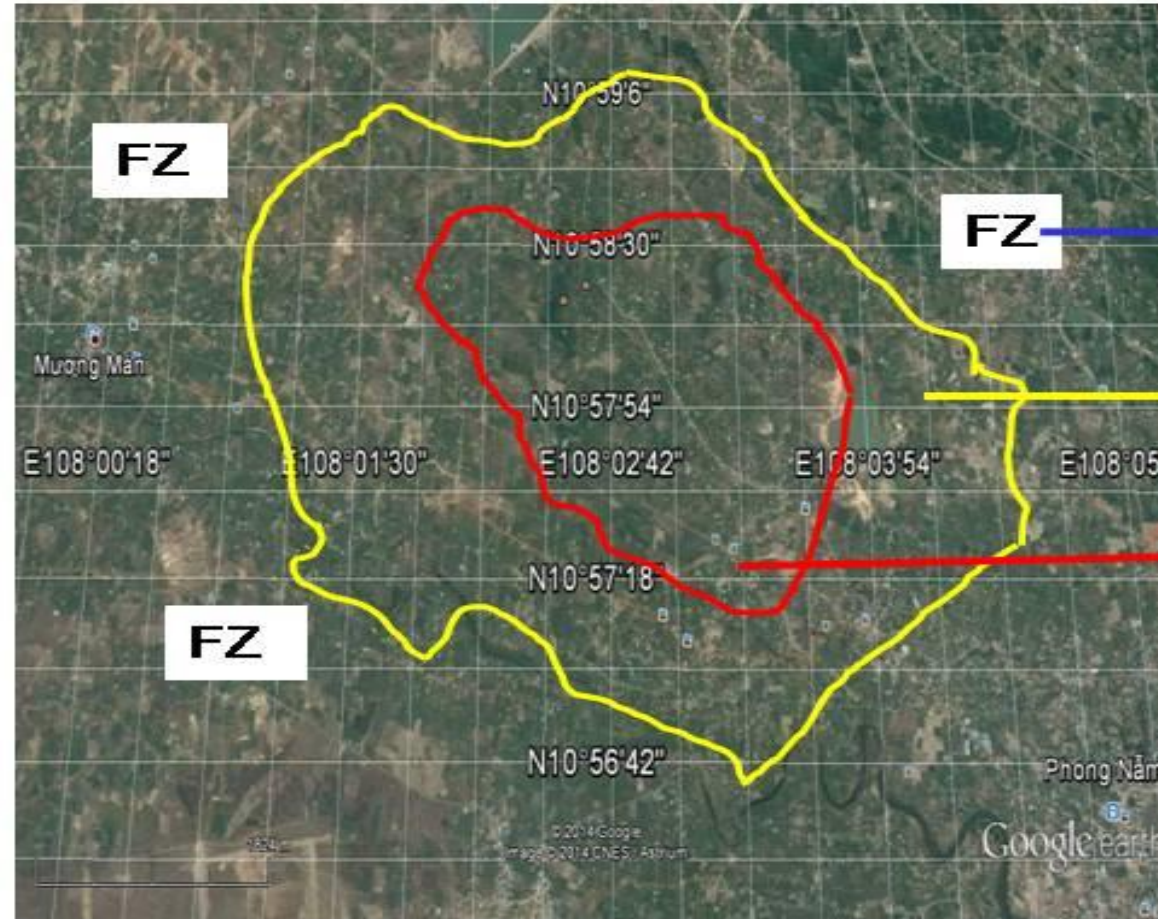
Malpighiales species



Dragon fruit production in Binh thuan province



The structure of demonstration on Dragon fruit production

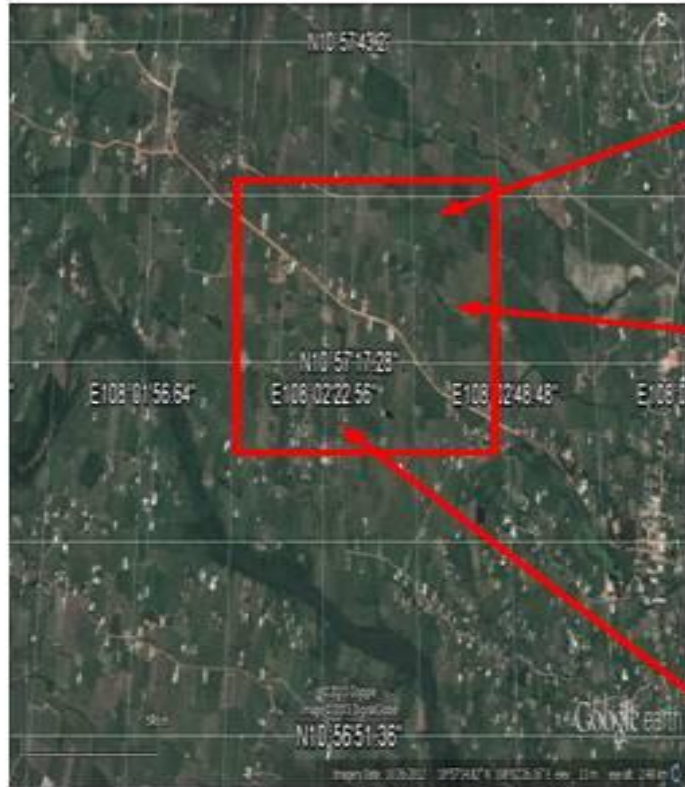


Control zone (16 ha)

Buffer zone (986 ha)

Core zone (581 ha)

Core zones: Three methods applied for fruit fly control



1/ Male Annihilation Technology (MAT)

- Using fiberboard block about 1 cm thick (5 x 5cm);
- Place at 50m intervals, replaced every 2 -3 months, maintained continuously throughout the year in the field to suppress the population of males

2/ Protein Bait spot spray

- 1 litter of Ento-pro 150 DD + insecticide + water
- Spot sprays of around 50 ml of the mixture per tree (dragon or other tree nearby). Volume 400 points/ha. Spraying at 10 days intervals; re-sprays if rainy



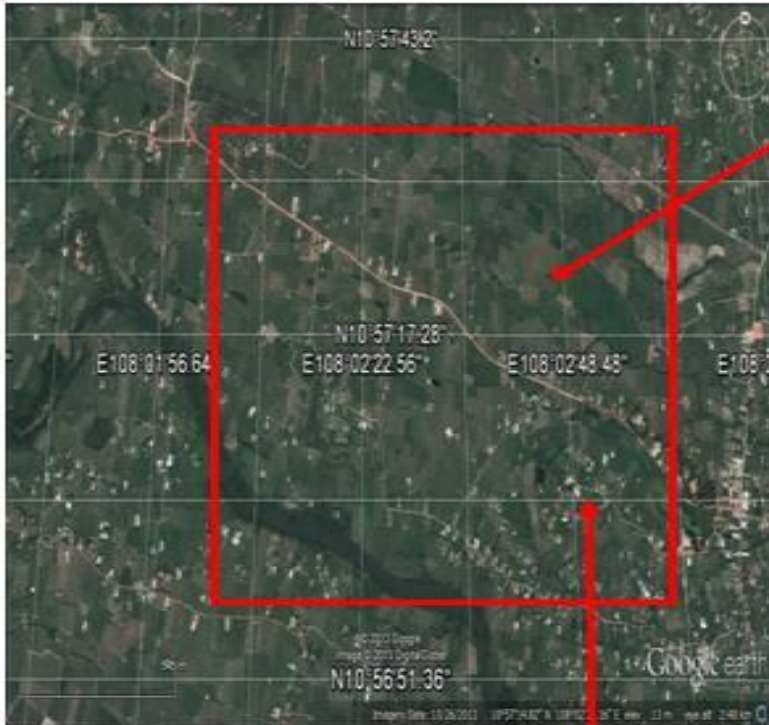
3/ Sanitation



Remove & destroy all fallen dragon fruit (plastic bag/ burned/ buried under ground/make organic-fertilize. Manage alternate hosts- mango, guava, cherry

Buffer zones: Two measures applied for fruit fly control

1/ Male Annihilation Technology (MAT)



Methyl eugenol attractant

2/ Sanitation



Plastic bag/ Burned/Make organic-fertilize

Farmer practice



Spraying chemical



Male annihilation traps

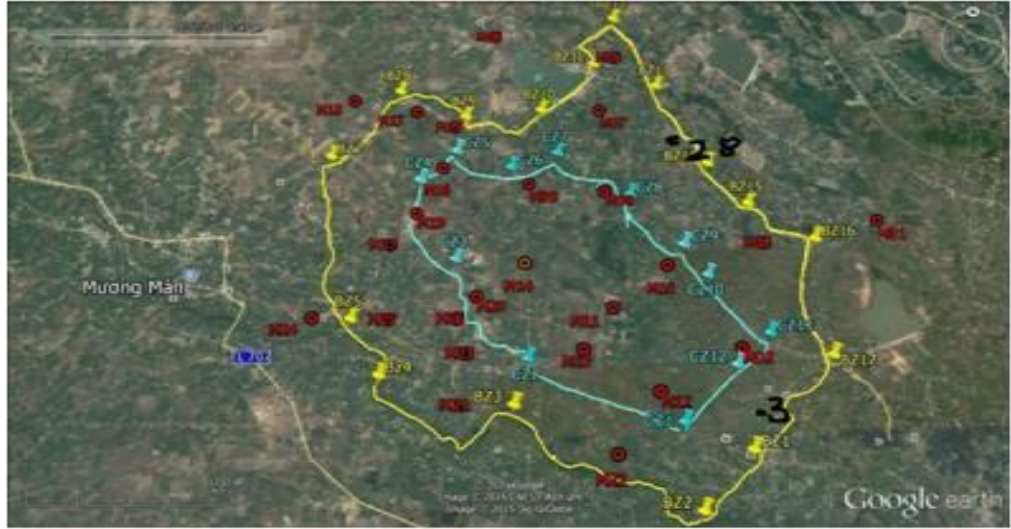
Assessment the effective of Fruit fly suppression programme



- Using plastic trap with cotton wick content 2,5 ml Methyl eugenol attractant



- 1 trap/6.25 ha,
- Re-new wick every 2 months



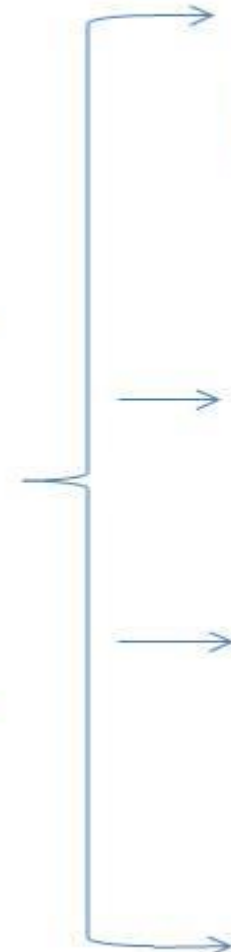
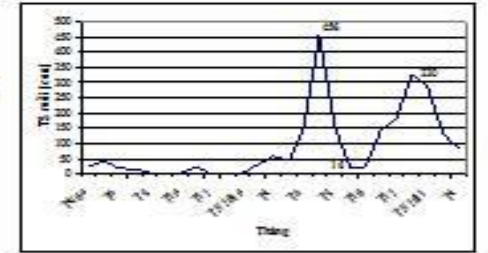
Applied for entire two zones

- ✓ Empty traps every 10 days and transfer caught flies to laboratory to calculate Fly/trap/day.
- ✓ Collect the dragon fruit to record the infested level

Supporting activities for demonstration in Ham Hiep village (Binh Thuan)



Survey the fruit fly species
Survey on host status:
infested level number of
major host, sensitive
period, population size,.....



PR/Training



Training

Broadcasting

Leaflet

Results of fruit fly suppression on Dragon fruit production

Data	Before AW-IPM implementing	After AW-IPM implementing		
		Core zone	Buffer zone	Control
Number of flies in traps per day (fly)	10 -250	< 2.20	< 4.11	< 28.93
Infested level of Dragon fruit (%)	7-25%	< 2.67	< 3.67	< 24.67

Conclusion and Future plan

Suppression methods such as MAT, bait spot spray, sanitation brought high efficiency for fruit flies management in dragon fruit production in Vietnam

YEAR	HECTARES	OBJECTIVE	STRATEGY
2016 - 2019	1600	Area-Wide Suppression	MAT- BAT- PILOT SIT
2020- 2021	3000	Area-Wide Suppression	REDUCE MAT- INCREASE SIT
2022 - 2024	20,000	Area-Wide Suppression. Fruit Fly Low Prevalence	SIT





ACKNOWLEDGEMENT

- Vietnamese Ministry of Agricultural Rural and Development
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- Binh Thuan province
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- International Plant Protection Convention

Thank you for your attention

