Food and Agriculture Organization of the United Nations

CIHEAM

Recent advances in insecticide treatments and application against the RPW

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The main problem is not the kind of insecticide to apply but how to reach the pest.

Treatments again the adults.

- The adults like low-light environment and fears dry and hot temperature conditions.
- They hides deeply behind the base of the petioles and inside the infested tissues.

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Usual spraying techniques are not adapted

- They will not reach the adults deeply hidden behind the petioles

False ideas about oviposition have been rectified recently which enabled to discard inappropriate treatments

- No previous wounds are necessary for oviposition
- Females dig holes with their rostrum to lay their eggs
- The eggs must be placed in alive tissue to survive
- The depth of oviposition holes is limited to the length of the rostrum
- Consequently sites of oviposition are very specific
- Treatment must be targeted to these sites

Consequence: The oviposition sites differ between palms

- For date palms

Great majority of infestations in date palms with offshoots and of less than 2-3 meter trunk height

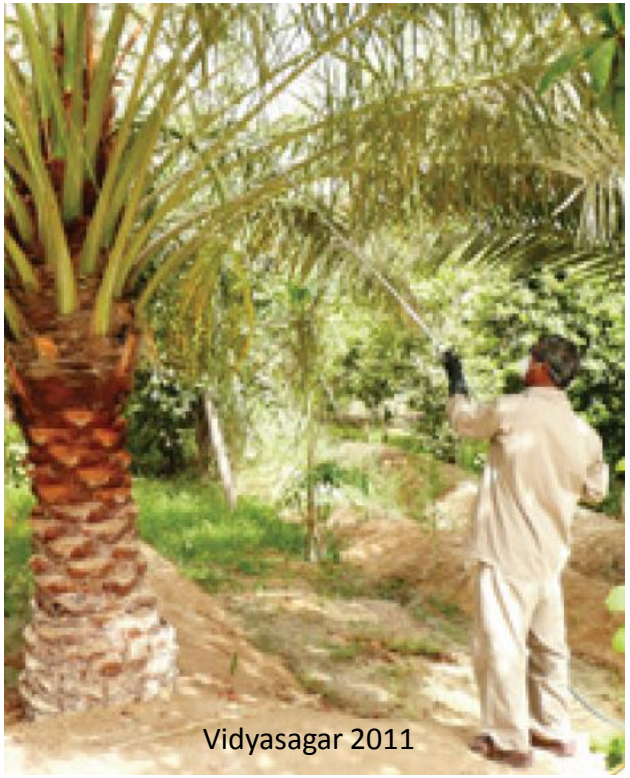
- For tall Canary palms

Majority of the tall palms are infested at the base of fronds

For date palms

- Targeted treatment to the bases of leaves and remaining petioles and to the offshoots.
- Soaking till runoff (nozzle of the sprayer are taken off)

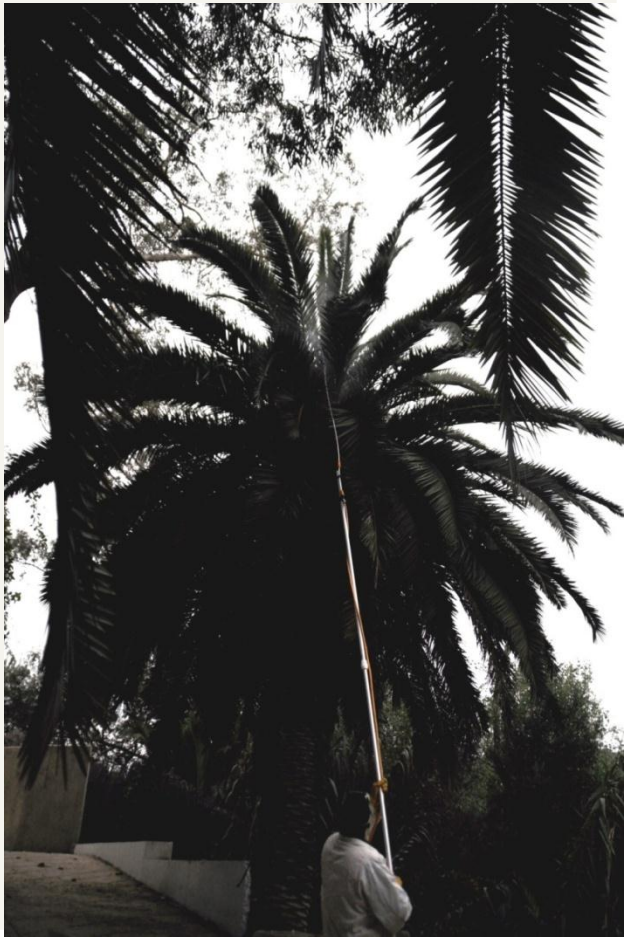
Can be perfectly applied by a trained farmer with a simple knapsack sprayer



With a lance (Vidyasagar proposal 2011)

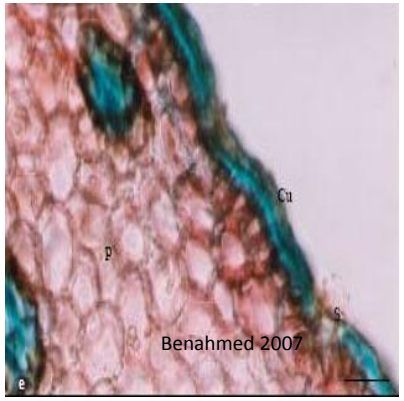
For Canary palms

- Soaking the central leaves bases of the crown till run off from petioles bases to petioles bases



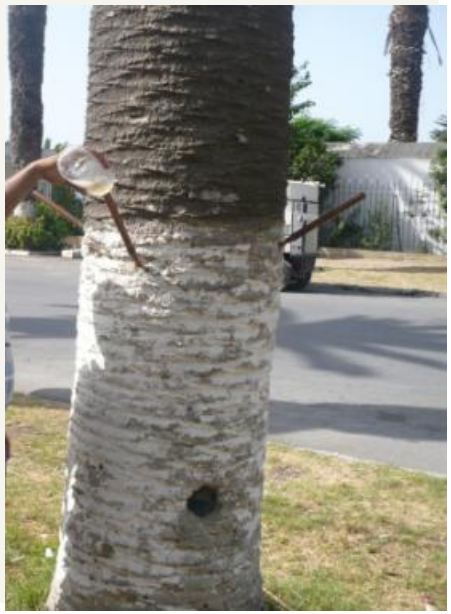
2) Against the eggs, larvae and RPW in the cocoons

- Soaking of the leaves bases can reach eggs, and cocoons but not the larvae except at the first stage.
- Furthermore, the penetration of systemic insecticides is blocked by the thick cuticle that covers the leaflets
- The larvae can't be reached except by soil drench, injection or fumigant treatments.
- Soil drench and injection techniques can be applied for preventive or sanitation purposes



Injection techniques

- They are based on realizing a hole (drilling, percussion) with consequently the creation a wound. The real wound can be much more important than the injection hole size. (High pressure, type of insecticide or dilution can increase it).
- But palms are capable to heal (to compartmentalize) their wounds.
- But they will never regenerate the wounded tissues nor cover the hole (they are not trees)
- Injections are not banal treatments. They can't be repeated too often
- Rigorous protocols (Where? How? How many holes? Which insecticide? Which concentration?)
- Many systems and equipments but very simple ones can work perfectly.



Preventive treatment by injection ?

- **For date palms**
- Difficult in date palms as the main targets are the offshoots (injections must as low as possible)
- **The issue of residues/delay before harvest: time for degradation depends of the type of insecticides.**
- Interest limited as this technique can't be used many times.

•For Ornamental palms

•health and environment safe: no spread of insecticide in the environment

• simple: drilling 4 shallow holes in the palm trunk and filling them with a simple device (injection by infusion)

• rapid: 2-3 minutes per palm

• economic cost assessment for NENA countries: 2-3 Euros per palm and per year.

• protects the palms for one year

Long list of chemical insecticides

- Organophosphates: Azinphos-methyl, Chlorpyrifos, Dimethoate, Diazinon, Formothion, Parathion, Phosmet, Pirimphos-methyl
- Benzoylureas: Diflubenzuron
- Carbamates: Aldicarb, Carbaryl, Carbofuran, Carbosulphan
- Phyrethroids: Bifenthrin, Lambda-cyhalothrin, Cypermethrin, Delthamethrin,
- Pyrazole: fipronil
- Neonicotinoides: Clothianidin, Imidacloprid, Thiametozam
- Bacterian origine: Spinosad, Abamectin, Emamectin

Short list of natural products

- Neem
- Research is on progress to find new products (plants extracts, essential oils, , special diatomaceous earth)

The second problem of the chemical treatments: low persistency

•Most of the chemical products are very quickly degraded by light (few days). Protected behind the petioles, it is considered that they remain active 3-4 weeks.

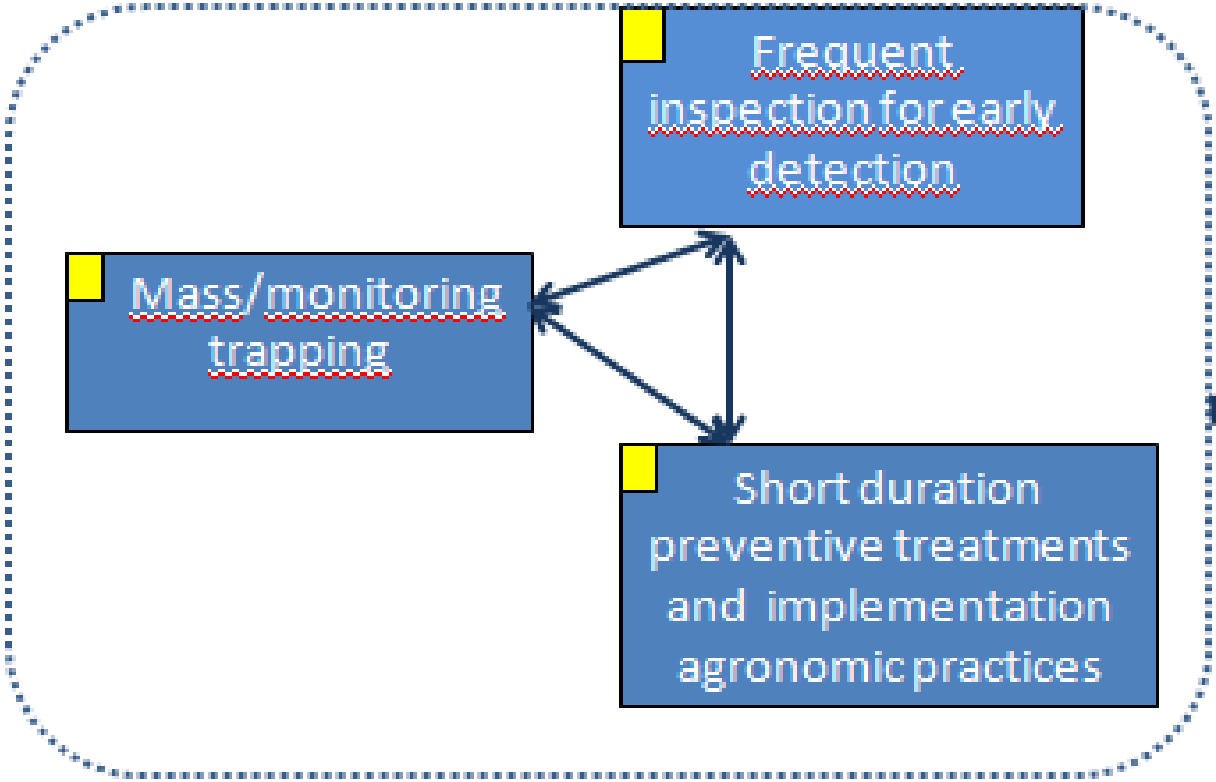
To assure a right protection, treatments have to be repeated frequently

Some research is going on to increase the persistance (paint, coating,…)

Chemicals treatments must be used only with caution and in specific conditions

- Health risk for the workers and for consumption (Chlorpyrifos was found to be the highest residual detected pesticide in Riyadh dates (Al –Saeid and Al-Dosari 2010)

The chemical treatments against the red palm weevil have to be considered as *an element of a global strategy focused to the eradication of the pest*.



- After offshoots pruning , offshoots removal and mechanical sanitation. On the palms close to the traps.

Thank you