

Fruit fly control for mango farmers in Ghana

Source

GIZ - Market-Oriented Agriculture Program (MOAP)

Keywords

Mango, integrated pest management, fruit fly, pheromone traps

Country of first practice

Ghana

ID and publishing year

8471 and 2015

Sustainable Development Goals

No poverty and life on land

Summary

This practice describes how the mango fruit fly can be controlled using male traps and field sanitation.

Description

Mango production can be affected by the fruit fly. In the following video four farmers from the Eastern Region of Ghana share their experiences with fruit fly control in mango plantation, by using male traps and field sanitation.

- Video: From farmer to farmer: fruit fly control (https://www.youtube.com/watch?v=4deA99PIF_I)

1. How to build a fruit fly trap for monitoring

Farmers can either buy the traps in special stores, or build their own. For this, you will need:

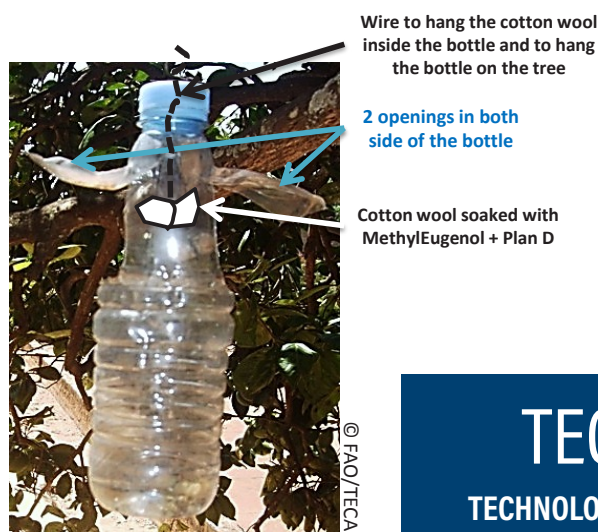
- plastic bottles (small one, 500 ml);
- a knife;
- gloves;
- cotton wool;
- thread or wire;
- plan D (insecticide); and
- methyl Eugenol (pheromone).

1.1 Steps for building a trap

1. Cut the bottle with two rectangular openings on the opposite sides.
2. Flag the ends of the openings for the flies to enter preventing going out (Figure 1).

3. Attach the cotton wool with the wire
4. Soak the cotton wool with a mix of four parts of Methyl Eugenol for one part of Plan D. Methyl Eugenol (protein bait) attracts the fruit flies while at the same time Plan D kills them. Note: in this video, Plan D is the name of the product based on synthetic pyrethroid (deltamethrin). Any other product based on deltamethrin can also be used. Attention: this method poses little risk to people, but still it is recommended to protect your hands with gloves while manipulating the products, and to avoid inhaling them.
5. Place the soaked cotton wool inside the bottle and close the tap (Figure 1).
6. Hang the trap on a branch of a tree.

Figure 1. Scheme of an homemade fruit fly trap for mango plantation



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This trap will only attract and kill male flies (Figure 2), that will slow down the reproduction rate of flies and so there will be less offspring with the time. The trap also allows you to monitor the number of fruit fly population in the mango plantation. If in one day, many flies are caught in the trap, it can mean that the female population still remains high, so you may resort to insecticides.

Figure 2. Dead fruit flies (males), killed by the pheromone trap



1.2 How to install traps in the trees

Usually, one trap for two trees is sufficient (in this example, there are 40 trees, so the farmer needs 20 traps). Preferably, set the trap in the shade, under the tree, where the flies are mostly attracted. Tight the wire around a branch, in order that the trap is hung on the tree, without touching branches. Make sure that the two openings are well open.

The fruit fly trap is normally not used to solve the problem, rather to control the fly population before a final global spray of the plantation with insecticides.

1.3 How to use chemical bait to control fruit flies

In this eastern region of Ghana, a chemical bait-insecticide (Great Bait) was introduced three years ago to control the fruit fly population. This protein bait is specific to the fruit fly, it only attracts and kill these

flies. On the knapsack (sprayer), add 1 part of the chemical bait for three parts of water, then shake vigorously the mix (Figure 3).

Figure 3. One part of the chemical bait for three parts of water



For example: for a 15 litre knapsack sprayer, you need 3.75 litre (1 gallon) of the bait that you mix with 11.25 litre of water and this mix enables to treat 15 acres of the mango farm.

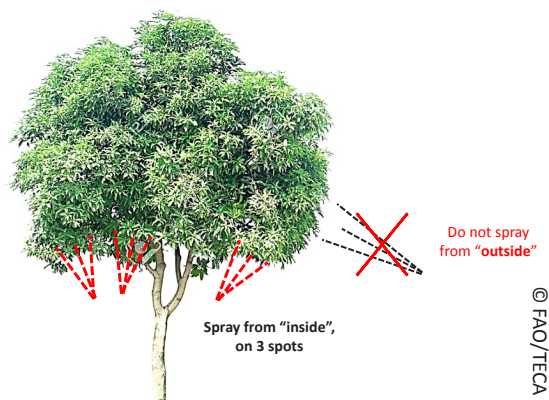
Do not wait until the fruits are ripe for spraying the mango plantation with the insecticide. If you monitored before the fruit flies' population with the traps and you noticed that a lot of flies were killed, it means that the population is building up, so you have to react. The insecticide can be applied until three weeks before the harvest of fruits.

Here are some advices to spray mango trees:

- Spray from "inside" the tree (above the tree, above the branches), not from outside, neither directly on the fruits (Figure 4).
- Spray three spots on the edges of the canopy but not in the centre of the canopy (Figure.4). Do not spray the entire tree. Do not spray on fruits!
- Spray each second or ninth tree (Figure 5). You do not need to spray every tree.



Figure 4. How to spray a mango tree against fruit flies



- Distribute the spray between the rows of trees (Figure 5). It is important that the treated spots are distributed over the plantation.

1.3 The role of farm hygiene in fruit fly management

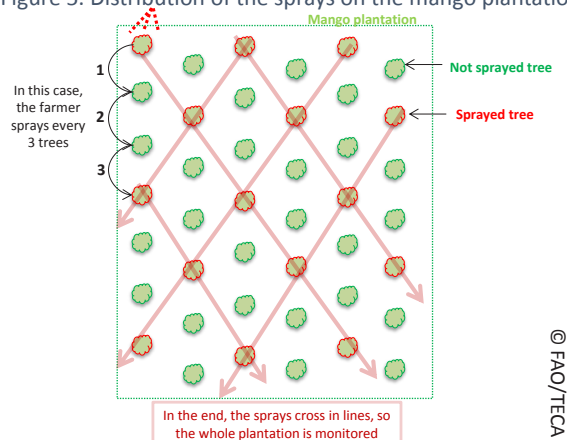
Controlling the fruit flies' population only by trap and insecticide monitoring is not sufficient to solve the problem: you also have to pay attention on the farm sanitation.

The fruit fly lays its eggs within the fruit. When the fruit falls from the tree, the maggot stays and grows inside the mango. Then it comes out of the fruit, pupates in the soil, becomes a fly and goes up again into the tree.

So, if you want to break the cycle, it is recommended to collect and bury properly all the fruits which fall down. Collecting rotten fallen fruits into black polythene bags that you let exposed in the sun will kill all the insects (Figure 6), so then you can bury the fruits. Do not bury the plastic bag!

Another solution to control fruit fly population would be to use the natural predators of these flies, such as the weaver ants, known to feed on fruit fly larvae, or the parasitoid wasps which naturally

Figure 5. Distribution of the sprays on the mango plantation



lay their eggs into the fruit fly larvae. Therefore, it is not recommended to blanket spray the plantation with insecticides – as this would kill these natural enemies.

The solution is to spray a protein bait which is applied only on a few spots (not every tree, and not on the entire tree) (See above 4. How to use chemical bait to control fruit flies) and which attracts (and kills) fruit flies.

Figure 6. Collect of rotten fallen mangos into black plastic bags



There is no need to breed the weaver ants or parasitoid wasps, as they are already naturally available. But they can be supported with patches of natural vegetation between mango orchards.



Also, especially in the case of plantations located in slopes, it is recommended to scythe/harvest the grass of the plantation rather than ploughing the soil and leaving it uncovered: this would increase the erosion of the soil.

You manipulate and / or use pesticides? Make inquiries before! Pesticide can be harmful to your health, the health of your family, of the consumers and of the environment. Use pesticides safely. Click on the following link for more information concerning reducing risks while manipulating pesticide: <http://teca.fao.org/read/8348>

2. Validation of the practice

The practice was applied in the Brong Ahafo region in Ghana in collaboration with the Kintampo farmers. For more information see the video above.

3. Minimum requirements for the successful implementation of the practice

- Tools needed to build the trap.

4. Agro-ecological zones

- Tropics, warm

5. Related/Associated Technologies

- TECA technologies no. 8348 and 8238

6. Objectives fulfilled by the project

6.1 Resource use efficiency

This technology helps to reduce the loss in natural resources handled and, thus, helps to use resources more efficiently.

6.2 Pro-poor technology

Controlling mango flies can rescue the mango harvest and reduce the risk of harvest loss.