



N°= 4

Use of GF-120 ['Success Appat'] in fruit fly control



Important : optimum fruit fly control is achieved through strict application of tools and methods outlined in this specification sheet.

Background :

The mango industry in West Africa has been confronted for decades with the problematic issue of fruit flies (Diptera Tephritidae).

A new invasive fly species of Asian origin, *Bactrocera invadens* (Photo 1), has appeared and dispersed throughout West Africa in 2004 and 2005. This new pest considerably increased damage to mangos (Photo 2) and other marketable fruit species.

The extent of damage recorded in Benin in 2006 (for seven cultivars) ranged from an average of 17% at the beginning of April, to 80% at the end of June at the end of the mango season (Vayssières et al., 2006). It is therefore essential to provide growers with economically viable techniques for pest control, that are also sustainable and environment-friendly. Use of GF-120 is a proven control method and can be included in the IPM package that we would like to make available to growers in West Africa.



Photo 1



Photo 2

Product description

Success Appat (S.A.) is a bait compound made out of food substances and a spinosad-based insecticide (0.24 g/l), that attracts then kills the fruit fly species in the treated area. This natural spinosad insecticide is obtained using fermentation of a soil bacterium, *Saccharopolyspora spinosa*. The bait is composed of water and attractant foods (proteins, sugars, fruit aromas and kairomones...).

Procedure: the adult fruit fly is attracted to the bait, gorges itself, then dies rapidly (within one hour) due to the consumed insecticide.

Packaging: Success Appat is sold in one-litre plastic bottles (Photo 3) of suspension concentrate.



Photo 3: Bottle of Success bait



Targeted insects

Fruit fly species belonging to the *Bactrocera* and *Ceratitis* genera.

Targeted crops

All fruit trees likely to be attacked by fruit flies, particularly those producing marketable crops such as mango trees, citrus fruit trees or guava trees.

Recommended dosage = 1 litre of formulated product per hectare (up to 1.25 l/ha).

Product dilution:

- Dilute S.A. in water before use, adding 1 litre of S.A. to 5 litres of water.
- Shake the bottle of S.A. well before diluting.
- Always prepare the mixture just before use.



Equipment required

- Manually-operated 16-litre constant pressure sprayer (ex : Berthoud Apollo) (**Photo 4**).
- This sprayer requires a conventional conic nozzle with 1–2 mm hole, spraying 4–6 mm droplets on the leaves.
- Protective overalls (**Photo 5**), a mask, a pair of goggles.



Photo 5: Protective overalls



Photo 4: Manual sprayer

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Application

▪ Important requirements :

- Use recently manufactured products and not old stock.
- Reapply treatment if spray applications are followed by moderate to heavy rain. The product resists light moisture, but heavy rain after application diminishes its effectiveness.
- Avoid spraying in windy weather.
Note: S.A. provides 8 days of protection. This period can be reduced by rain and the 'Harmattan' wind.

▪ Initial treatment and repeat applications

- Apply S.A. as soon as the Economic Injury Level (EIL) is reached. In Benin, we have different values of EIL, depending on market price, cultivars and also loss assessment.
- First application should be made at stage 2, i.e. several weeks before fruit pre-ripening. This destroys the development cycle of the fruit fly species.
- Continue regular treatment every 7 days as long as the number of weekly trapped flies is above the EIL.
- Cease treatment when the fruit is ripe.

Example: In Benin (**Figure 1**) treatments usually begin for early cultivars at the end of February and are discontinued at the end of April, and from mid-March to mid-May for late cultivars, i.e. approximately 8 weeks of treatment per cultivar.

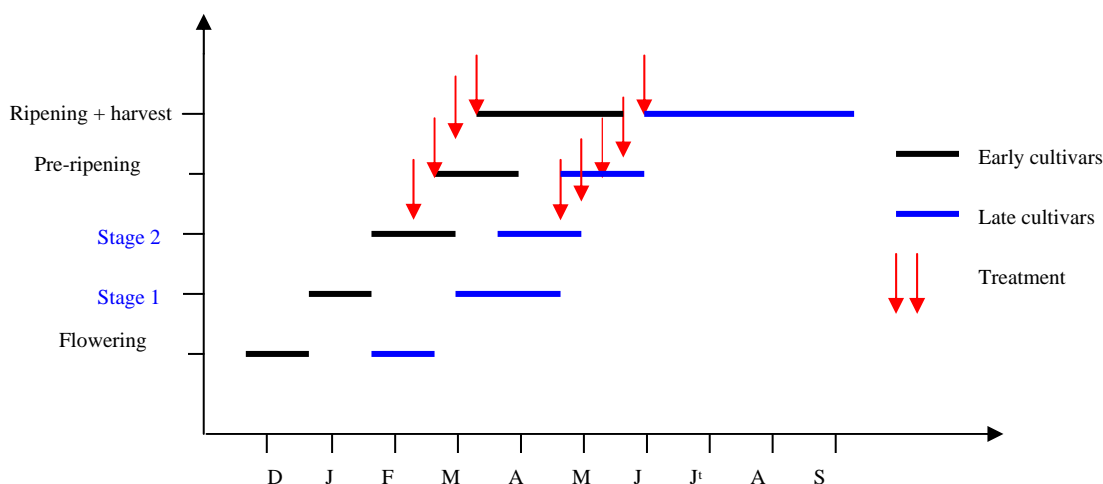


Figure 1 : Example of treatment timetable for mango trees in Benin

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Application method:

- Treat with a solution prepared just before use.
- Treat all the mango trees in the orchard (**Photo 6**).
- Apply the mixture all over 1 m² of foliage, about 2-3 metres from the ground.
- Spray until the product runs off the foliage.
- Treat all the mango trees each week.
- Avoid treating the same branches in consecutive weeks to avoid any phytotoxicity.
- The trees around the edge of the orchard should be treated every 10 m, particularly wild host trees (*Annona senegalensis*, African peach, shea-butter tree...).



Photo 6: Mango tree treatment session.

Results obtained in Benin

The S.A. product was tested in Benin during 2006 and 2007, achieving positive results overall (Vayssières et al., in review). Weekly treatment of orchards led to about 80% reduction of damage caused by fruit flies in treated orchards, compared to the control orchards (Figure 2). These are the results of experiments undertaken in 10 orchards (5 control and 5 treated) in 2006 and repeated in the same orchards in 2007.

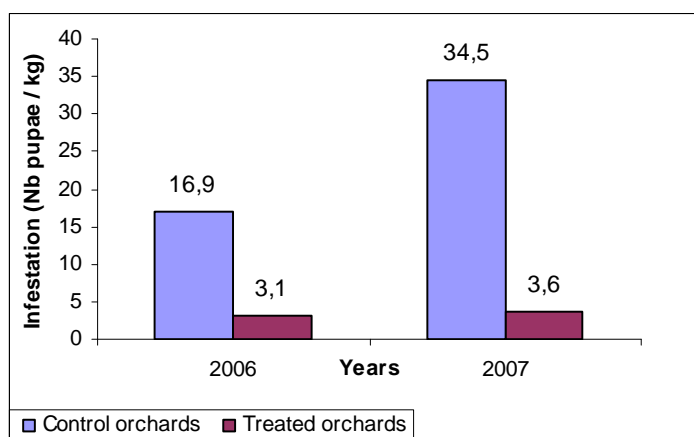


Figure 2: Fruit fly infestations during the 2006 and 2007 mango seasons. Comparison of treated and untreated orchards (control).

Authors : Jean-François Vayssières* and Antonio Sinzogan

*CIRAD, UPR Production fruitière, Montpellier, F-34398 France; IITA, Cotonou, Bénin.

Layout : Alliance Tossou

For further information: Jean-François Vayssières. Tel: +(229) 21 35 01 88/ e-mail: j.vayssieres@cgiar.org