

# COMPARATIVE STUDIES OF BAIT STATION TO REEMPLACE THE FRUIT FLIES CHEMICAL CONTROL AND THEIR INTEGRATION INTO FRUIT FLY SIT MANAGEMENT PROGRAMMES

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## **Introduction**

Air and ground bait sprays, which constitute the standard control methods of Mediterranean fruit fly today for most countries, utilize a food-based attractant and an organic phosphorous insecticide. Although very effective when applied properly and at an appropriate time, bait sprays have a number of limitations, such as short residual activity and undesired side-effects. The finding of long-lasting traps is the goal of ongoing research efforts against this species and other pest fruit flies (Broumas et al., 1998).

Use of toxic traps in a baits station system gives satisfactory fly control in some cases of low population densities. The bait station (trap with attractant + insecticide) for the control of fruit flies is an innovative alternative to the traditional terrestrial or aerial application of toxic baits. This procedure has the advantage of not polluting the atmosphere and preserving the beneficial entomofauna (Putruele & Domínguez, 2001; Putruele & Scattoni, 2001).

Several types of traps are commercially available, with species-specific or general fruit fly attractants and with insecticide (DDVP, etc.). In this work, we report the results of comparative field studies on chemical control, deployment strategy and efficacy of the bait station methods in the control of the medfly. The tests were conducted from February to April 2012, in San Pedro (Argentina) with the objective of adding new tools in the integrated pest management (IPM) of fruit flies.

## **Material and Methods**

From February to April 2012, tests were conducted in the San Pedro area of Argentina with the objective of assessing new tools for integrated pest management (IPM) of fruit flies. San Pedro is in the North - East area of Buenos Aires Province, at 33° 39' latitude South and 59° 41' longitude West, at 26.99 m over sea level. Average winter temperatures range from 6.7 °C to 12 °C. The annual average temperature is 17 °C, the average RH is 76% and the rainfall average 1082 mm. The field test was conducted in four hectare 18 year old Okitsu mandarin orchard, with trees spaced 4 meters apart in rows 4 meters apart (625 plants/hectare), located in San Pedro and property of a local grower. The test was carried out between fruit colour change and harvest.

The following three treatments were tested (each in a one hectare plot within the 4 hectare orchard):

- A. Bait station: 70 Plus Trap (Süsbin)/hectare uniformly distributed.
- B. Ground bait sprays (chemical control locally in use) using Spinosad formulated bait (Flipper) containing 0.02% Spinosad, applied once a week.
- C. Untreated control (no control).

Medfly population densities in each plot was assessed every week by placing five Multilure traps (Better World) baited with a three component food-based synthetic lure containing ammonium acetate, putrescine and trimethylamine (BioLure, Suterra LLC) and Vapona to kill and retain attracted flies. Traps were sampled for 24 hs and the number of flies captured was recorded.

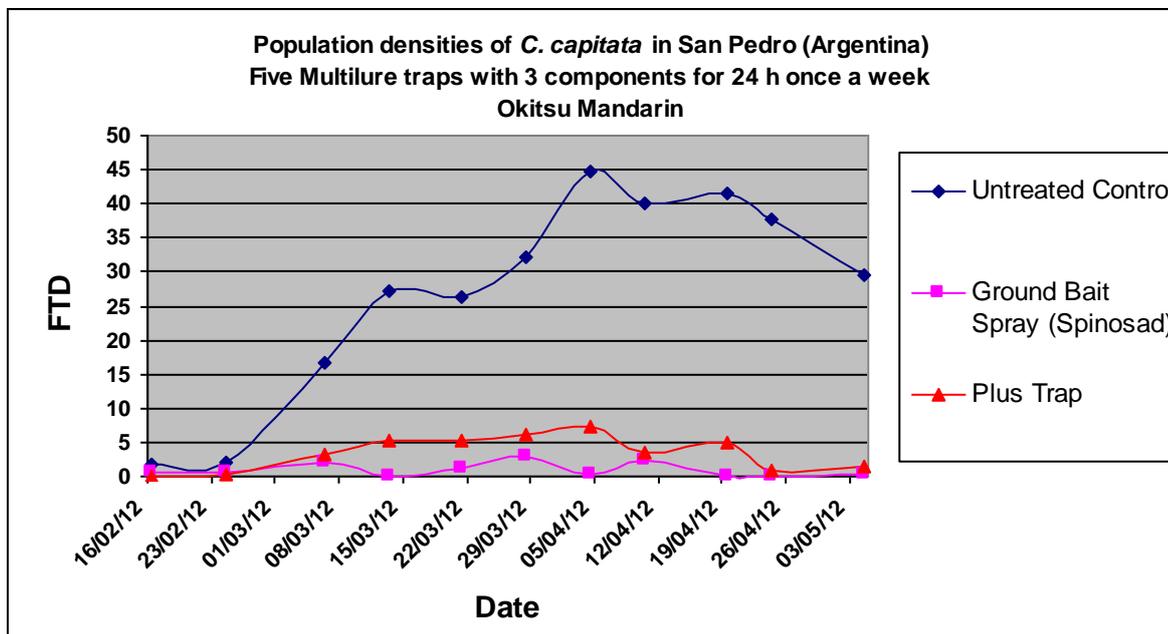
Fruit was sampled once a week in order to assess the infestation levels. One hundred fruits were collected and dissected for every treatment (1100 per treatment) and the larvae found were put in Petri dishes until adult emergence.

## Results and Discussion

### Pest population density:

During the period March-April 2012 *C. capitata* population reached exceptionally high populations in the orchard, as can be seen in figure 1. Medfly numbers in the untreated plot was up to nine times higher than that of Ground Bait Spray and Plus Trap plots (45 vs. 7 and 4, respectively). Medfly population in the Plus trap plot tended to be close to the Ground Bait Spray plot but reached higher values in all dates.

**Figure 1:** Population dynamics of medfly during the field test.



### Damage estimation:

Fruit infestation levels during the experiment are given in table 1:

**Table 1: Damage level per treatment**

Treatment	N° larvae total	Level damage (%)
Ground Bait Spray (Spinosad)	63	2.82 (31/1100)
Bait Station (Plus Trap: Süsbin))	107	3.91 (43/1100)
Untreated Control	785	41.8 (460/1100)

The Bait Station Treatment showed a slightly higher percentage of damaged fruit when compared to the Ground Bait Spray, but provided a remarkable control and protection of the fruit compared to the untreated control and taking into account the high populations of *C. capitata* recorded during the trial.

### Conclusions

Bait Station Treatment using Plus Trap exhibited control and protection of the orchard, as can be seen from the values of infested fruit and caught adults in Multilure traps.

We consider that the treatment protected the mandarin orchard during the entire time of fruit susceptibility.

By the way, in this year the population condition of Medfly was surprisingly bigger than the population history in this area. One of the reasons can be that this mandarin orchard was located where the others orchards (oranges, peaches) had been harvested, being the mandarin the only available host.

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