# HAW-FLYPM

***Hawaii Area Wide Fruit Fly Integrated Pest Management Program***

*July 2004*


## Melon Fly Suppression: Oahu Update

R. Pandey

It has been little more than two years since the area wide program started implementing fruit fly suppression in central Oahu. Initially, it was implemented as a demonstration program at a diversified commercial vegetable production farm, but later was expanded to cover larger farm community around the island. Both farmer and researcher groups have been benefited from the program not only by its success in fruit fly suppression, but also in the lessons learned from the shortcomings and occasional failures encountered while implementing the program.

Research scientists had already proven the effectiveness of the technologies to suppress fruit flies in smaller farms. Three tactics were in the show: 1) Use of augmentoria, specially designed tent-like structures fitted with appropriately-sized mesh screen was employed as a 'sanitation practice'. All the culled fruit were collected and placed into the augmentoria. 2) Population monitoring and male annihilation through the use of cue lure helped us understand the fluctuations in the melon fly populations over time and reduced the male fly population so that females would find it difficult to locate a mate. 3) Protein bait GF-120 with the environmentally friendly natural insecticide spinosad. GF-120 applications on non-host plants around the farms attract and kill young fruit flies that are in search of proteinaceous food in order to reach the sexual maturity.

Under small farm situations, farmers were willing and able to collect infested fruit and place them in the augmentoria. They usually had many non-host plants around the farm where GF-120 bait could be applied. Despite the great potential benefit of using augmentoria to dispose culled fruit, large farms were unable to adopt it due to practical reasons and sanitation was limited to immediate plowing of the field to enhance decomposition of fruit. This practice did not prohibit on-farm fly breeding but limited the availability of fly hosting to a narrow period of time.

After the implementation of the program, melon fly was notably suppressed, leading to minimal fruit infestation until August. No shipment was returned from the market due to fruit fly. Use of organophosphate insecticides tremendously declined. (*Continued)*

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HAW-FLYPM newsletters are a monthly publication of the Hawaii Area Wide Pest Management Program (AWPM). The purpose of these newsletters is to keep grower and community cooperators informed about fruit fly advances statewide. This publication also serves as a means to recognize HAW-FLYPM staff members and their outstanding achievements. Articles submitted for publication must be relevant to HAW-FLYPM and reviewed by our panel of editors.

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GF-120 application was limited to castor plants and corn seed production plots. Then, inadequate application of GF-120 during August-September months due to the lack of corn field (farm wide corn fallow in August) and clustered distribution of castor led to the outbreak of melon fly. However, the first year implementation provided great opportunity of having a firsthand experience of melon fly suppression on a large farm. Since then, farmers have developed confidence on the suppression technology, and researchers have had opportunities to re-evaluate program implementation based on hands-on suppression work.

In the second season, sudex was planted as a windbreak in the melon fields. Close observation of the data revealed that a melon fly population surge occurred after crop harvest. The culled fruit were found infested and were contributing to the population surge. GF-120 bait spray on the sudex borders during crop cycle and more importantly after crop harvest for 6 to 8 weeks were the key to melon fly suppression. As long as the practice was religiously followed, the fly population and fruit infestations were very low. Soon after the GF-120 bait spray was suspended due to the anticipated completion of melon harvest season, the melon fly population tremendously increased. Despite resumption of GF-120 applications in December, unusually wet winter made the melon fly suppression more difficult than thought (Figure 1). On the average, about two female flies were caught in the protein-baited traps. During the rainy season, farmers found it difficult to apply GF-120 as recommended. Whenever they applied it, the rain would wash it off, leaving it much less effective. We are expecting more dry weather and better efficacy of the GF-120 applications.

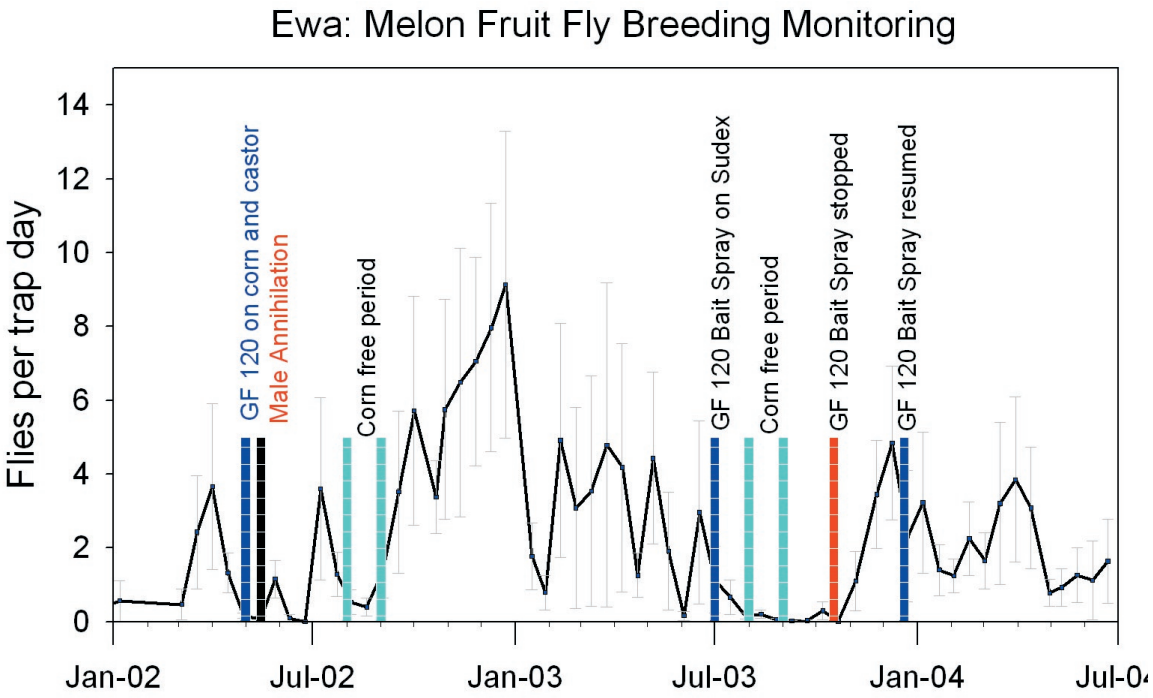


**Figure 1.** Average melon fly numbers per trap day at Ewa.

Three of the four farms grow at least one melon crop throughout the year and the production plots are not very far apart. Melon fly that has bred in one plot can easily find host crop in another plot within the farm. The fruit fly damage (portion of bar in red and black) on these three farms increased during February-March occasionally exceeded twenty percent and was found highest during these months (Figure 2A, B and C). During this time, GF-120 applications were again disrupted, contributing to high melon fly counts.

The fourth farm observes a melon-free period during the winter and follows a pest escape strategy. Recommended fruit fly suppression techniques were not as rigorously applied. Fruit infestation gradually increased from February to May (Figure 2D). Fruit infestation has begun to decline in all the farms in June, but at different rates.

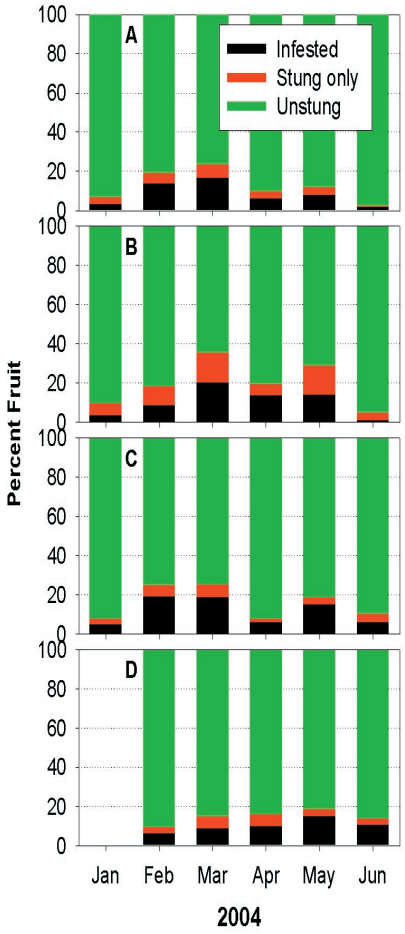


Figure 2. Fruit infestation at four Central Oahu farms
Infested = Presence of fruit fly egg or maggot
Stung only = Fruit fly damage but no egg or maggot
Unstung = Fruit not damaged by fruit fly

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On another note, the supposedly sterile sudex hybrid grass that was used in the program has produced some seed and has germinated. This could result into an undesired weed problem. The sudex hybrid grass has effective cytoplasmic male sterility but full functional female parts. Any sorghum pollen from neighboring fields could lead to seed development. In anticipation to this potential problem prompted to plowing the border before the sudex seed head reaches maturity. This would lead again to inadequate GF-120 applications making fruit fly suppression more difficult. We are currently looking for an alternative to this sudex.

The program was then extended to farms at Kahuku, Punaluu, Waimanalo and Waialua. These relatively smaller farms (20 – 40 acres) are specialized to year-round production of crops such as cucumber, carabasa pumpkin, long squash, zucchini, ridge gourd (Sequa), or bitter melon. The cultural practices among the farms are considerably different and so is the level of melon fly damage. Importance of sanitation practices, male annihilation, and weekly application of GF-120 bait spray on sudex borders are emphasized. All the farmers have experienced the benefit due to reduction in fruit fly infestation as a result of the program. These farms are located on the windward side of the island that receives more frequent and higher amount of rain. Because the last winter season was unusually wet, many farmers could not apply the GF-120 bait spray as desired.

A considerable amount of success has been observed in two of the seven farms where the Oahu fruit fly team is working closely with windward extension agent, Ms. Jari Sugano. Sudex is available on these farms in addition to other non-host plants where GF-120 is being applied more regularly. Fly population has declined, resulting in decreased infestation. However, adoption of the techniques depend on the extent of fruit fly damage, realizations the economic benefit of the control program, and other socio-economic factors. Communication is sometimes a hindering factor when working with non-English speaking farmers. But, in addition to researcher-extension and worker-farmer communication, we expect some farmer-to-farmer word of mouth to encourage other farmers to adopt the technology.