

ROLE PLAYED BY THE COMMUNITY, SMALL-SCALE FARMERS AND GOVERNMENT DURING ERADICATION AND SUPPRESSION OF THE ORIENTAL FRUIT FLY (*Bactrocera dorsalis*) (DIPTERA: TEPHRITIDAE) IN THE GREATER TZANEEN MUNICIPALITY, LIMPOPO PROVINCE, SOUTH AFRICA

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BACKGROUND

The Oriental fruit fly (OFF), *Bactrocera dorsalis* syn. *Bactrocera invadens* (Diptera: Tephritidae), is a quarantine pest of Asian origin with host plants including mango, citrus, guava, marula, banana, peppers, tomatoes and cucurbits. The OFF was first detected in the Greater Tzaneen Municipality, Mopani District Municipality in the Limpopo Province of South Africa in 2012 in a citrus orchard. The Mopani District earns 50 % of the farm income in horticulture and contributes significantly towards the agricultural activities. The most produced crops are citrus, mangoes, avocados, pawpaw and bananas and are sold locally and internationally. The delimiting surveys were initiated from December 2012 to January 2013 covering the area of 5 km radius for each incursion from the original detection site according to the South African *Bactrocera invadens* Action Plan. The majority of detections were between January and March 2014 during the season of host plants, high temperature and rainfall in the district. Eradication and suppression measures were implemented from September 2013 to January 2014.



Figure 1: Picture of *Bactrocera dorsalis*

MATERIALS AND METHODS

The eradication and suppression methods included weekly applications of Bait Application Technique (BAT), using M3s and male annihilation technique (MAT) blocks by deploying Methyl eugenol baited insecticidal blocks plus Malathion in the quarantine area. The ground bait sprays used were protein bait sprays, Hym lure+Malathion EC. More than 15 000 litres of GF-120 bait was provided by the Department of Agriculture, Forestry and Fisheries (DAFF). Small-scale farmers and the community were provided with MAT blocks and M3 bait stations to place in their backyard gardens and orchards and they were also urged to conduct orchard sanitation. Eradication teams were provided with gloves, reflector vests, *B. dorsalis* bookmarks, sanitation leaflets and maps. Ground-based sprays were applied to host plants in affected production areas depending on crop and time for harvest. The DAFF and the Limpopo Department of Agriculture placed MAT blocks and M3 bait stations on road transects, and in public areas and towns. The Limpopo Provincial Department of Agriculture was actively involved in the hanging of MAT blocks and M3 bait in the villages and also the organising of tribal and community meetings in the affected areas.

RESULTS AND CONCLUSIONS

The *B. dorsalis* trap catches were dominated by male specimens which were collected from methyl eugenol baited fruit fly traps. Few females *B. dorsalis* and *Ceratitis* species were collected from biolure (ammonium acetate, putrescine (1, 4-diaminobutane), and trimethylamine hydrochloride), baited traps. There was no detection of *B. dorsalis* in Hoedspruit and Letaba areas in 2012, while the average fruit flies per trap per day (FTD) value calculated per year was 0.001 in Deerpak area, which started to increase and spread to other areas towards the end of 2013 with the highest values during February and March. The average FTD values calculated per month from February to December 2014 in the areas were 0.0535, 0.1229 and 2.2183 in Letaba, Hoedspruit and Deerpak, respectively. The increase in value was attributed to availability of host plants such as mangoes, papaw as well as high rainfall in the areas. The highest values of 0.0973 and 0.3821 FTD for January and June 2013, respectively, are indicative of an area of low pest prevalence, but with the highest concentration of positive trap catches at rural villages within the Deerpak area in the Greater Tzaneen Municipality.



Figure 2: Map of the Deerpak area in Greater Tzaneen Local Municipality, Mopani district municipality, in Limpopo Province used to indicate the 5 km radius area under quarantine as well as the delimited area after the detection of two flies in 2012.



Figure 3: Illustration of the deployment of M3 bait stations and Mat blocks on the marula trees in Greater Tzaneen Local Municipality



Figure 4: Farmers' meeting during the demonstration of application of GF 120 in Hoedspruit



Figure 5: Farmers' meeting during the distribution of chemicals for eradication and suppression of *B. dorsalis* in Deerpak area, Greater Tzaneen municipality

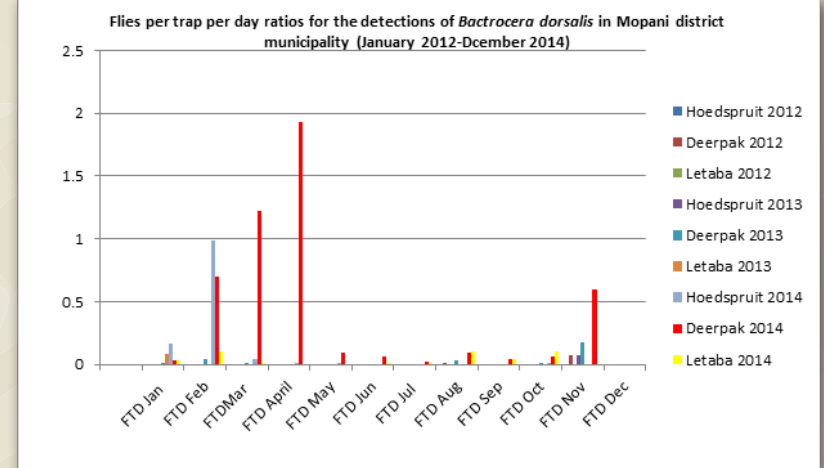


Figure 7: DAFF officials visiting Moleketla Village to assess if community complied in using chemicals in their backyards



Figure 8: Farm workers and government officials during eradication of *B. dorsalis* in Greater Tzaneen municipality

AWARENESS

Public awareness was facilitated through meetings with the community and farmers. Steps were taken to elevate awareness within South African fruit industries, among official ports of entry and within provincial departments of agriculture, local departments of agriculture, traditional leaders and local communities were alerted about the danger of a *B. dorsalis* incursion. These awareness actions were carried out to encourage cooperation and support from role players and serve to address uncertainties and fears on community level regarding *B. dorsalis*. Pest alert leaflets, posters, as well as semi-scientific and newsletter articles, radio broadcasts and several interactions with the general media formed part of this campaign. Awareness was done through letters sent to traditional leaders, mayoral municipalities and schools and through SABC radios, Capricorn FM and Sekgosese Community Radio Station as well as through the distribution of *B. dorsalis* bookmarks.



Figure 6: Demonstration of orchard sanitation through collection of dropped fruits

CURRENT STATUS

The current status of *B. dorsalis* in the Mopani District, described in the appropriate terminology of the IPPC, is as follows: it is present, but under official control.

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