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What do we know so far? An overview of the Queensland fruit fly post-production pilot programme

ABSTRACT

The Sterile Insect Technique (SIT), as an environmentally friendly and non-invasive control option, is an essential tool in controlling Queensland fruit flies (Q-fly), *Bactrocera tryoni* (Froggatt) in urban areas both as part of area-wide management programs and in response to incursion events. Significant advancements have been made in the mass production of quality Q-flies and the methodologies to deploy them in the target area. A post-production pilot programme is being conducted to establish operational procedures and demonstrate program efficacy to ensure that reliable and sustainable SIT is available when needed to protect production and market access. Utilizing the sterile Q-flies produced by a factory established at Port Augusta in South Australia, the project aimed at optimizing the delivery process and rearing-out of flies, and determining the effect of sterile insect release on population growth rates and wild fly population catches. In 2019-2020 field season, approximately two million sterile Q-flies were released every week in each treatment site, Cobram (VIC) and Hillston (NSW), and the effect of releases was compared with the corresponding non-release control sites, Mooroopna (VIC) and Darlington Point (NSW). We present here results from Victoria which showed three peaks of wild male Q-fly as reflected by the catch numbers in cuelure-baited traps. There was a positive correlation between the catch of wild male Q-flies in traps and rainfall occurring the preceding days, ranked highest to lowest three, five, seven, and 10 days before traps servicing, but no correlation between catch in traps and preceding temperatures. Male Q-fly catch at the control site of Mooroopna was approximately six times greater than in the treatment site of Cobram supporting the expectation that sterile male Q-fly is mating with wild female conspecifics, which is driving population growth rates down. Results on the longevity of the sterilised male from season three releases have indicated that these sterilised flies may have sufficient longevity and sexual activity, as indicated by catch in cuelure-baited traps, to investigate the potential of reducing the frequency of male Q-fly releases from weekly to fortnightly. If this can be achieved, this would result in a substantial financial saving to any Q-fly sterile release program.



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Dr Bishwo Mainali has worked as an Applied Entomologist for the past 20 years and has extensive experience with numerous insect pests including stink bugs, whitefly, thrips, and fruit flies. Bishwo has worked on the development of benign control methods of these pests including the design and development of lures and traps. Currently, his work focuses on Q-fly rearing and development of QC protocols, ecology, and all major operational elements of the Sterile Insect Technique.

