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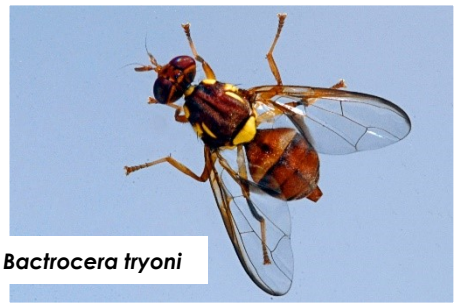
a technical update published by HORTGRO science

Preventing the spread of *Bactrocera dorsalis*

Andrew Jessup, an Australian research horticultural entomologist, recently visited Hortgro Science to share his insights on dealing with fruit fly invasion. Jessup spoke to researchers and other industry stakeholders about the importance of monitoring for *Bactrocera dorsalis*, and why "prevention is better than cure".

Bactrocera dorsalis (BD) or Oriental fruit fly is currently present in the northern and eastern regions of South Africa. Currently, it is not present in most of the deciduous fruit regions of South Africa.

Hortgro Science and Fruit Fly Africa (FFA) invited Jessup to South Africa to share his extensive experience in the management of the Queensland fruit fly — a *Bactrocera* species in Australia. He has been involved in a multitude of fruit fly projects, and projects relating to market access and trade-related aspects. Here are some of the key insights he shared for preventing a “BD takeover”.



Bactrocera tryoni

Similarities between *Bactrocera tryoni* and *Bactrocera dorsalis*

- *B. tryoni* and *B. dorsalis* are extremely invasive pests.
- The Queensland fruit fly is consistently described as the most damaging pest to Australia’s horticulture industries with an annual economic cost averaging around $25.7 million from 2003 to 2008 (Aguilar 2015).
- Both species have multiple hosts.
- Both are highly plastic. Their plasticity allows them to survive almost anywhere in varying climates — cold temperatures won’t necessarily kill it, as some of these flies are known to survive in temperatures as low as –5°C.
- Ecologically, they are r-selected species (meaning it can produce many eggs, and many of those eggs hatch and become mature adults), and are capable of rapid population increase.
- Both can lay up to 2000 eggs in a lifetime, out of this number 800 mature to adult flies (400 male and 400 female). Only two to three populations like this can mean an explosion of the pest, which could make it uncontrollable.

Bactrocera dorsalis

- *B. tryoni* and *B. dorsalis* flies will lay their eggs in anything small and round — even unripe fruit or tennis balls (as tested by Jessup and his team).
- These flies have a symbiotic relationship with bacteria, and they carry it with them throughout their lifetime. They inject this bacteria into fruit to break down the tissue around the egg laying site, which means when the egg hatches there are broken down proteins and amino acids immediately available for the larvae to feed from.

Comparison between the *Bactrocera* species and *Ceratitis capitata* (Medfly)

- While the *Bactrocera* species can lay up to 2000 eggs per lifetime, the Medfly only lays about 500 to 800 eggs per lifetime.
- The Medfly also doesn't tend to fly very far, so it's more controllable than the *Bactrocera* species, which can fly up to 40 to 50 km in its lifetime.

Primary Control of the *Bactrocera* species

- Reading the signs and monitoring before the problem occurs is key — prevention is better than cure.
- In Australia, they have to manage fruit flies all year round. They start with one to several monitoring traps per 10ha in fruit fly zones.
- Australians also monitor their fruit through periodic visual inspection of crops as it matures.
- Set up action programs before the problem occurs (e.g. baiting program, start baiting well before the fruit is ripe, particularly after flowering [flies are around even during this time])
- Baiting is regarded as the most valuable method for fruit fly control, and proves most effective when used together with male annihilation.
- Constant year-round area baiting is key, because *Bactrocera* has multiple hosts.
- Orchard baiting should be done 6 weeks prior to harvest, and continue 3 weeks after harvest.
- Remember it must be done weekly and again after rain.
- Public awareness: many of South Africa's fruit fly issues are urban. Awareness needs to be created in urban communities, these communities need to be educated on how to detect and report fruit flies.

Take home message

Stop the spread of fruit flies by doing the following:

- Year-round monitoring with traps, and fruit collection
- Public awareness, educate urban communities about the pest
- Working collaboratively with government and communities to annihilate the pest

Want more information? Watch Andrew Jessup talk to Hugh Campbell about dealing with the *Bactrocera* species in our short five-part video series (total viewing time 8 minutes) here: http://bit.ly/2BWq7zb