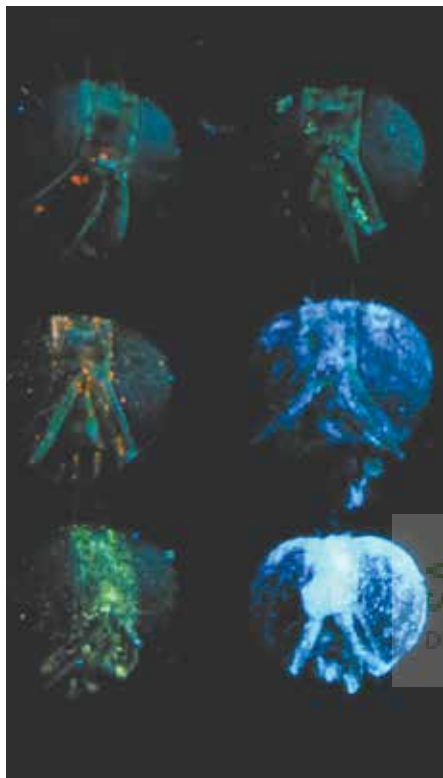


Colour run for Oriental Fruit Flies

Fluorescent pigment powders can be used to mark oriental fruit flies for field experiments and sterile insect releases, says Dr Chris Weldon from the University of Pretoria.



To many people, one fly looks much like another, but the correct identification of fruit flies in traps is important for monitoring infestation risk of fruit grown commercially. For scientists performing field experiments on pest fruit flies, or releasing sterilised insects for sterile insect technique programmes, it is even more important to correctly identify flies that have been released. But how is it possible to tell one fly apart from another one of the same species? Louisa Makumbe, a PhD student in the Department of Zoology and Entomology at the University of Pretoria, and funded by Citrus Research International, Hortgro Science and the South African Tablegrape Industry, investigated this question. She focused on the highly invasive oriental fruit fly (*Bactrocera dorsalis*) and obtained glowing results that are now published in the journal *African Entomology*. The most commonly used method for marking pest fruit flies is to apply fluorescent pigment powders. The fluorescent dust is mixed with the pupae, coats emerging adults, but even after flies groom themselves some pigment is retained in part of the head between their compound eyes. When viewed under ultraviolet light, the brightly glowing spot between their eyes can easily identify marked flies. For some fruit flies, like the Mediterranean fruit fly, the best colour and dose has been studied and determined, but this information was not available for the oriental fruit fly. Due to this, Louisa set out to optimise the application of fluorescent pigment powders to effectively mark the oriental fruit fly.

Bright spots of colour between the compound eyes of flies and other body parts seen under ultraviolet light can be used to identify those marked with fluorescent pigment powders and released into the field. PHOTOGRAPHER: CHRIS WELDON

Local Citrus Specialist Honoured in Florida



Dr Graham Barry of XLnT Citrus in Somerset West recently returned from a trip to Florida, USA, where he participated in the centennial celebrations of the University of Florida's citrus research and education centre.

Dr Barry was invited as one of the international distinguished alumni.

Dr Barry (on right of pic with Dr Bill Castle) studied for a PhD at the University of Florida from 1997 to 2000 before returning to South Africa to continue his career in citrus research and later citrus breeding before starting a consulting business to citrus growers and exporters both in various parts of South Africa and internationally, for example Spain, Egypt, Turkey, California and Argentina.

Dr Barry has been involved in the South African Citrus Industry for the past 27 years, and is the owner of XLnT Citrus, a company focusing on the development and implementation of novel and innovative citrus products and services, and provides independent technical and strategic consultation services to stakeholders in the Citrus Industry.

In 1917, the Legislature of the State of Florida established the Citrus Experiment Station (CES)

The oriental fruit fly is highly invasive and now found in the north-eastern parts of South Africa. PHOTOGRAPHER: NINA PARRY

Louisa began by running laboratory tests on how different doses (0, 2, 4 or 6 g/l of pupae) of pink, orange, green, yellow, blue and “invisible blue” (a light yellow powder that glows blue under ultraviolet light) affected adult emergence, survival, and the visibility of marks. She found that dose had no effect on adult emergence, and survival to 28 days was actually higher in marked flies than unmarked ones. The different colours had no effect on the number of flying adults or survival to 28 days. Visibility of marks was above 90% for up to 14 days, but gradually decreased thereafter. Pink and orange marks were the most visible after 28 days, with approximately 80% of flies retaining marks of these colours.

The laboratory results were then verified under field conditions. Louisa placed flies marked with doses of 0 or 2 g/l in sleeve cages on a loquat tree and their survival and mark visibility was again assessed. Pigment concentration and colour had no effect on survival or mark visibility. However, high levels of mark visibility were retained for only seven days before declining to an average of 67% by 28 days after adult emergence.

These results show that all tested fluorescent pigment powder colours may be applied at 2–4 g/l of pupae to mark adult oriental fruit flies. Although pigment marks were lost over time, this is thankfully not a major problem in SIT programmes where millions of sterile flies are released weekly and few flies are recaptured after two weeks of release.

So this work represents a bright start to studying oriental fruit flies in the field and the potential future development of their control using SIT in South Africa.



These results are published in full in: Makumbe, L. D. M., Manrakhan, A. and Weldon, C. W. (2017). Optimisation of fluorescent pigment marking for *Bactrocera dorsalis* (Diptera: Tephritidae). *African Entomology* 25: 220-234.

For more information, contact Dr Chris Weldon, Department of Zoology and Entomology, University of Pretoria: cwweldon@zoology.up.ac.za

in Lake Alfred, Florida to conduct research in support of Florida's growing citrus industry. Since that time, the Florida citrus industry has grown to become a major contributor to Florida's economy, thanks in part to the many advances in citriculture that occurred through the research programs at the CES, later named the Citrus Research & Education Center (CREC).

2017 marked the 100th anniversary of the CREC, and the many accomplishments of the CREC during the past century were celebrated. Dr Barry was invited to serve as an invited speaker in the “Distinguished CREC Alumni Forum: 100 years of Citrus Production and Processing Research” which took place on 30 November 2017.

Dr Barry's keynote presentation on “Global Trends in Citrus Varieties” was well received. Dr Michael Rogers, center director at the research center said: “As a former CREC alumnus, we are excited to have you return to the CREC to participate in this special event with us.”

“The best part of my travels is seeing how well the South African citrus industry is doing. The most down-heartening part is seeing the devastation that plant disease has wreaked in Florida”, said Dr Barry. Contact details: ghbarry@gmail.com: 082 900 0616

