

# FRUITOPIA

## NEWSLETTER

ARC-Tropical and Subtropical Crops campus, Mbombela



October - December 2020

### FOOD MOUNTAIN FOR WORLD FOOD DAY

**O**CTOBER marked the commemoration of World Food Day; a time of the year when the plight of

870 million undernourished people in the world is highlighted. Most live in rural areas where the main source of income is agriculture.



ARC-TSC food mountain.

To acknowledge the day, ARC campuses participated in the food mountain challenge, where non-perishable food items were collected at each campus and the campus that produced the highest food mountain was declared the winner and could donate the food to a charity of their choice. Our campus took second place with 69 food items collected, just barely losing out to the winners, ARC-SCW with 74 food items.

**A special thanks to everyone who participated and contributed, lets keep up the good work and bring the trophy home in 2021!**



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### EDITORIAL COMMITTEE:

Ms Lecarmen Alves  
Dr Elliasha Hajari

### LAYOUT AND GRAPHIC DESIGN:

Estelle Nieuwenhuis  
Lecarmen Alves

### SEND YOUR CONTRIBUTION TO:

[AlvesL@arc.agric.za](mailto:AlvesL@arc.agric.za)



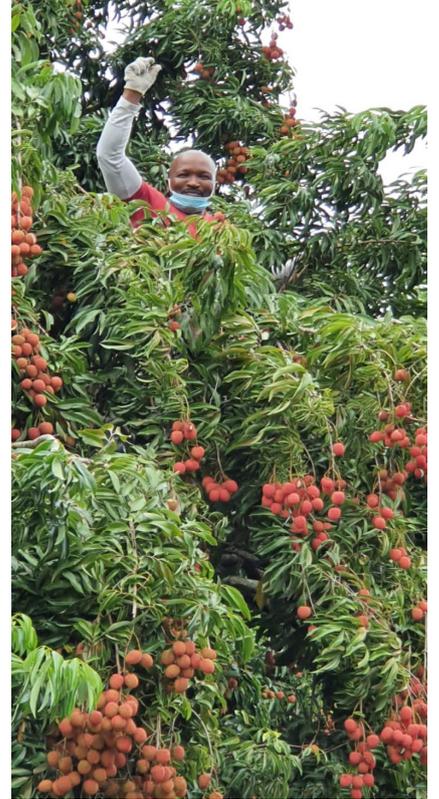
## ARC-TSC's FIRST ANNUAL LITCHI HARVEST

**D**ECEMBER marked a new tradition at our Nelspruit campus where the Litchi Harvest Season was celebrated. Litchis are harvested every year around the festive season. Colleagues took time away from their office and lab stations to

assist the farm in harvesting fruit from the orchards. Although the harvest had to be cut short due to heavy rains, the team managed to collect an incredible 56 crates within half a day. Activities included picking, sorting and loading of litchis.

*Thank you to everyone who participated, see you all on the next harvest day!*





## RESEARCH HIGHLIGHTS

### Entomopathogenic Nematodes - Biocontrol Agents Against Lepidopteran Pests Occurring on Macadamia in South Africa

Dr Willem Steyn

**M**ACADAMIA fruit in South Africa are attacked by a complex of Lepidopteran moths, including the litchi moth (*Cryptophlebia peltastica*), false codling moth (*Thaumatotibia leucotreta*) and the macadamia nut borer (*Thaumatotibia batrachopa*).

Damage to macadamias is caused by the larvae boring into the fruit before shell hardening. In small nuts the entire kernel is eaten, whereas in large fruit, part of the kernel may remain (Fig. 1).

These three lepidopteran pests have a stage/s of their life cycle in the soil providing the opportunity for exploring the use of entomopathogenic nematodes for their control. Entomopathogenic nematodes (EPNs) of the genera *Steinernema* and *Heterorhabditis* occur naturally in soil throughout the world where they parasitize different life stages of various soil-inhabiting insects (Fig. 2). The nematodes are symbiotically associated with bacteria and together they kill and utilize their insect host within 48 hours. The EPN's are

commercially available in numerous countries in several formulations. Concerns with using exotic EPNs in South Africa include the possible displacement of native nematodes, effects on non-target organisms and strict South African regulations regarding the importation of exotic organisms. Furthermore, exotic nematodes are not adapted to local environmental conditions.

Surveys are currently being conducted in many countries, other than South Africa, to find endemic nematode isolates with good efficacy against a specific target insect. Currently, there is no endemic EPN product available in South Africa.

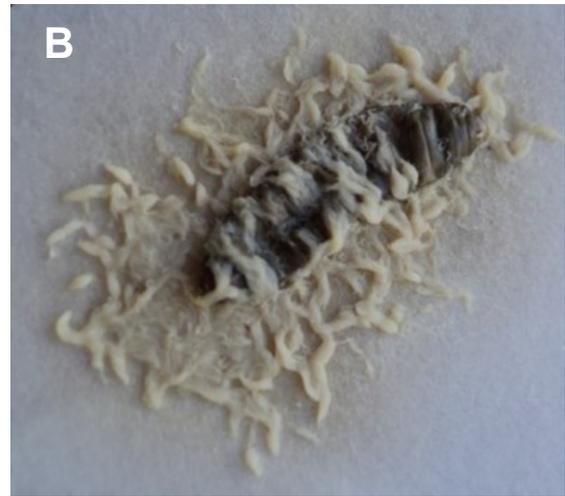
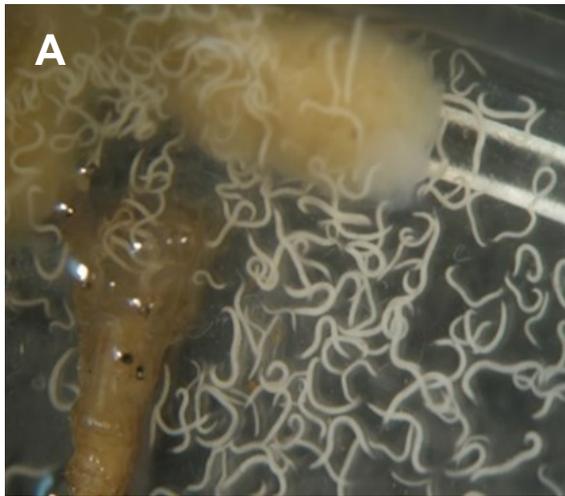
There will be additional benefits in the use of EPNs in macadamia orchards such as the possible control of other pests such as thrips species and it will play an important role in the elimination of nut borer (false codling moth, macadamia nut borer and litchi moth) individuals selected for resistance during previous chemical applications.



Figure 1: Feeding damage of macadamia nut borer. A) Larval entrance hole into a macadamia fruit. B) Damaged macadamia nut kernels.

The application of EPNs also have the additional benefit of prolonging the life expectancy of the chemicals used against moth pests through

reduced selection pressure (a useful tool in insecticide resistance management strategies).



**Fig. 2: A) Entomopathogenic nematodes dissected from a mealworm cadaver seen under a stereo microscope. B) Entomopathogenic nematodes (infective juveniles) emerging from a wax moth cadaver.**

## **Fruit Flies Associated with the Pepper-Bark Tree in Mpumalanga Province, South Africa**

**Dr Tertia Grové, Dr Karin Hannweg and Ms Karen de Jager**

**P**EPPER-BARK (*Warburgia salutaris*) trees are widely used in southern Africa owing to their multitude of medicinal uses and therefore play an important role in traditional healing systems. Earlier conservation work revealed that the trees in the north-eastern parts of South Africa were heavily infested with fruit flies and fruit fly larvae, thus damaging the seed. Furthermore, overharvesting, indigenous timber clearing, agriculture and human living requirements all threaten the tree's future existence in the wild and therefore it is categorized as an endangered tree on the IUCN Red List.

The aim of this study was to identify fruit fly species infesting pepper-bark trees in the Mpumalanga province of South Africa. Fruit were randomly sampled between 2014-2017 at three locations

in the Mpumalanga province and fruit flies were also trapped in the vicinity of pepper-bark trees at the Skukuza indigenous nursery, Kruger National Park. A total of 7 427 Marula fruit flies, *Ceratitidis cosyra* (Walker) (Diptera: Tephritidae), emerged from the sampled fruit. The trees produce fruit over several months and were affected throughout the fruiting season and the infestation index for the Marula fruit fly varied between 399 and 2 852 adult fruit flies per kg of fruit. This is extremely high and therefore when fruit are collected for seed extraction and propagation, it is important to do fruit fly trapping and fruit inspection. For severe infestations, fruit can be covered with bags or sleeves for protection against the Marula fruit fly. Bait stations and sanitation can also be used for the suppression of fruit fly numbers.



**Fruit fly larvae inside fruit of the pepper-bark tree.**



**Fruit of the pepper-bark tree.**

## **Students from the University of Mpumalanga visit the Drying Unit Ms Tshimangadzo Malindi**



**O**N the 21<sup>st</sup> of October, Ms Tshimangadzo Malindi and her team hosted sixteen curious advanced diploma in Agriculture students from the University of Mpumalanga. Students received practical training on processing and drying of banana using the electric dehydrator and solar drier. Fruit drying is a useful strategy to preserve and extend the shelf life of fruit and leads to new products.

The ARC is committed to its role in developing the capacity of the next generation of scientists and entrepreneurs.

**Students from the University of Mpumalanga at the ARC-TSC drying unit.**

## **Farmer Development and Commercialization of Tropical and Subtropical Fruit**

**Dr Candy Khosa, Mr Oscar Maphanga and Mr Bongumusa Mbatha**

**D**R Khosa, Mr Maphanga and Mr Mbatha had the opportunity to visit a group of smallholder farmers from the Thengane area that is 160 km east of Hluhluwe, uMhlabuyalingana Local Municipality at the uMkhanyakude District Municipality. Dr Khosa presented information on the research programmes at the ARC and highlighted the range of

services available to commercial and smallholder farmers in the agriculture industry.

Farmers shared the challenges experienced in the lack of support from other organizations and have since formed an informal group called INSIKA YABALIMI aimed at creating a supportive structure for the group. The goal is to farm sus-

tainably and to expand existing operations to improve quality and profits.

The farmers also indicated an interest in acquiring new, improved cultivars with predictable yield and quality. Farmers also expressed a need for certified disease-free seedlings from nurseries with

affordable prices. The ARC-TSC will be stepping in to assist farmers with cultivars suitable for their area, help to design management programs for crops, assist in gaining market access and provide access to agro-processing and other appropriate opportunities.



**INSIKA YABALIMI**  
members. Back row: (left to right)  
**Mr MR Mkhonto (chairperson),**  
**Mr JB Mthembu (treasurer) and**  
**Mr SW Maphanga.**

Front row: (left to right) **Ms PZN**  
**Mageba, Mrs NN Gumede and**  
**Ms NN Khumalo (secretary).**

**Pineapple genebank at ARC-TSC**  
**(Hluhluwe Campus) with edible**  
**and ornamental cultivars.**



## **Mango Tree Planting at Friedenheim Farm**

**Mr Moses Molope, Ms Tshimangadzo Malindi and Ms Marsia Mazibuko**



**T**HE ARC-TSC post-harvest division joined the Friedenheim farm team to plant 80 mango trees ('Tommy Atkins' cultivar) at the Friedenhiem research farm. The trees will be used for agro-processing of mango in the near future to increase the volume of mango fruit products (leathers and dried fruit).

**Mr Moses Molope, Ms Tshimangadzo Malindi,**  
**Ms Marsia Mazibuko and farm assistants**

## STAFF NEWS

### Retirements



**Mr AS Mhlanga**

Early retirement at the end of October 2020 (Levubu).

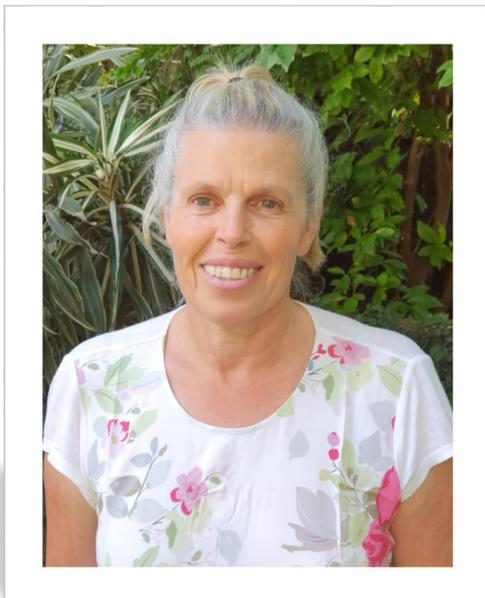


**Mr M Machava**

Retired at the end of October 2020 (Burgershall).

**“It's been a privilege working with you, and now it's an honor helping you celebrate your retirement”.**

### Achievements



**D**R MIEKE DANEEL has been appointed as an Extraordinary Associate Professor in the Research Unit for Environmental Sciences and Management at the Potchefstroom Campus of the North-West University for a period of three years.

**D**R **CANDY KHOSA** has been appointed as the ARC Coordination Chairperson responsible for effective responses to National and International funding opportunities at a corporate level for a period of three years.



**CONGRATULATIONS colleagues.  
You deserve this success !!!**

## Contact information:

**Tel:** +27 (0)13 753-7000

**Fax:** +27 (0)13 752-3854

**Email:** [infoitsc@arc.agric.za](mailto:infoitsc@arc.agric.za)

### Postal Address:

ARC-TSC  
Private Bag X11208  
Nelspruit/Mbombela 1200,  
South Africa

### Physical Address:

Corner of Bosch Street and  
Kanyamazane Rd R2296,  
Mbombela

<http://www.arc.agric.za>

