

# FARMSCAPING PLAN LOOKS TO CUT PEST LOADS AND BOOST BIODIVERSITY ON SA SUGARCANE FARMS

Colleen Dardagan

*Farmscaping (n): An inclusive approach to pest control that focuses on increasing biodiversity on farms to maintain healthy populations of beneficial insects, birds and other wildlife as a vital element of a best management Integrated Pest Management strategy. (Wikipedia)*

A landmark observation study is underway to increase biodiversity on South Africa's sugarcane farms in a bid to further boost integrated pest management strategies.

Expected benefits include cutting back on pesticide use and reducing costs while developing healthy, robust biodiverse systems in a monoculture such as sugarcane.

The observation study - under the leadership of Iona Basdew - a Biosecurity Scientist at the South African Sugar Research Institute (SASRI) - began late last year with initial sites demarcated on farms in KwaZulu-Natal's Northern and Southern Midlands, North Coast and Zululand South.

*BELOW: Farmscaping plot.*





Dr Thomas Funke who is the CEO at SA Canegrowers is urging growers to participate in the project saying the future sustainability of the sugarcane sector is integrally linked to farming methods that harness a range of diverse strategies, particularly when linked to pest control.

“For our industry to remain viable into the future – which is very uncertain and unpredictable in the face of growing global insecurity and the climate crisis – we need the kind of innovation that this project promotes. It is also very important particularly as we look to the certification of South Africa’s sugarcane crop to make sure our sugar is eligible for export to destinations such as the European Union,” Funke said.

*BELOW: Ant Edmonds – a commercial sugarcane and avocado farmer at Table Mountain outside Pietermaritzburg – is just one of several growers who are participating in the South African Sugarcane Research Institute (SASRI) evidence collection enterprise.*

*BELOW BOTTOM: The plants chosen for the project include flowering annuals and perennials, aromatic herbs, aloes and indigenous nectar and pollen rich plant which are attractive to insects and birds.*



### Sustainable and responsible

Basdew, who is a Biosecurity Scientist at the South African Sugar Research Institute (SASRI), said the study dovetailed with the industry’s Sustainable Sugarcane Farm Management System (SUSFARMS®). The system was first introduced in 2002 as a farm management tool aimed at encouraging sustainable and responsible sugarcane production.

The management system encourages the use of better management practices and is designed to reduce the negative impact on the environment of farming activity while helping sugarcane farmers to achieve compliance with legislation, maintain a high level of social responsibility and secure financial sustainability.

SUSFarms® has funded the development of two observation sites in the Midlands North and two sites in the Midlands South and while Farmscaping is not a new concept it has never been tested in the South African sugarcane industry before.

“On some farms we have up to three sites demarcated and ready for planting, whereas other farmers have opted for just one site. Once the area is marked out, I collect insect species within a 1km radius of the site. I take the samples back to the laboratory where I record each species of insect and their prevalence. This I will do every six months to track the progress and changes in predatory insect diversity and abundance,” Basdew said.

It is hoped that this important grower-led observational study will not only encourage farmers to embrace increased biodiversity on their farms but will allow for a collection of evidence on how farmscaping can assist to cut back on pest loads.

Ant Edmonds who farms at Donovale Farms outside Pietermaritzburg has hailed the initiative as “crucial” for an improved Integrated Pest Management plan. “Farmscaping is essentially creating safe havens for predatory or beneficial insects such as lacewings (*Neuroptera*) and ladybirds (*Coccinellidae*) among others. Creating biodiverse sites in and around our orchards and sugarcane fields, we believe, is building symbiosis between our multi-crop commercial agriculture venture and the natural environment. The days of blanket



*LEFT: Iona Basdew, who is a Biosecurity Scientist at the South African Sugarcane Research Institute (SASRI) and project leader on a landmark Integrated Pest Management biodiversity observation study.*

spraying are long gone, orchards and sugarcane fields with neatly mown inter-rows are no longer desirable. For us it is all about harnessing the power of nature by increasing biodiversity on our farm to allow insects, birds and the like to thrive resulting in a balance between predators and pests,” he said.

According to research, one ladybird can eat up to 5 000 insects in its two-year cycle, while lacewings can eat anything up to 100 Yellow Sugarcane Aphids (*Sipha flava*) in a day.

### Diversity absence

Basdew said prior research had shown that a diverse range of insects predate on aphids, including hoverflies, ladybirds, lacewings, parasitoid wasps, pirate bugs, damsel bugs, ground beetles, mantids, paper wasps, predatory mites, dicyphus bugs and certain arthropod species such as spiders and earwigs.

“Field surveys carried out in the Midlands, coastal and Northern inland regions produced contradictory findings. The primary predators captured were ladybirds and that was mainly on the coast. Lacewings were more prevalent in the Midlands. The captures also delivered little in the way of diversity. However, up to four different pest species were found which included Eldana, the Yellow Sugarcane Aphid, mealybug, scale bug and thrips.”

Basdew said this was a clear view of the absence of diversity among predators and the growing incidences of pests which, she added, was a direct consequence of the monoculture nature of sugarcane production.

“Our farms are devoid of indigenous vegetative diversity which translates into a sterile agriculture system that provides an ideal breeding ground for pests,” she said.

In her initial proposal, Basdew details the long and short-term objective of the project. “The long-term objective is to transform the sugarcane landscape to attract and harbour beneficial insects and fauna by cultivating verges, roadways, water courses and natural zones with specific flora, each with reported benefits for specific groups of insects,” she said.

In the short-term she would test the theory of ecological engineering and its benefits for improving biodiversity and pest control.

“The growers who participate are provided with a list of plants which they must plant out. I assist in the sourcing and planting of these species, however - except for those growers supported by SusFarms® - the growers do need to fund the plants themselves. Plants will differ in each area based on climate, space and the resources available. Their selection will depend

on how effectively they harbour predators as well as providing habitats for pollinators particularly on farms where multi-cropping – sugarcane, macadamia, avocado and granadilla or litchis - is prevalent.”

### Guidelines

Basdew outlines what she calls the “SAFE” principles for Farmscaping as follows:

1. Shelter: The chosen areas should be protected from insecticides, intensive tillage, or other practices such as burning and could include a permanent border such as a strip between a macadamia orchard and a sugarcane field.
2. Alternative food source: Some pests are present over a short period of the crop growing cycle. This is not the case with the aphids and Eldana which are present all year round, however, population density does vary which means the provision of alternative food sources e.g. nectar and pollen is crucial.
3. Flower-rich habitat: Pollen and nectar are essential foodstuffs for parasitic wasps, hoverflies and lacewing adults and provide an alternative food source for ladybirds, pirate bugs, soldier beetles, lacewing larvae and predatory flies.
4. Environment: Beneficials thrive in an environment with floral diversity and minimal exposure to insecticides. A healthy environment also promotes beneficial and healthy diversity.

With a substantial list of plants specifically chosen to meet the required criteria, Basdew said farmers could start small and keep it simple. “This is not a quick silver bullet solution, and I think we will all learn, adapt and fine tune as we go along. Some maintenance will be required in the first few seasons as the plants become established. And to start we have chosen flowering annuals planted alongside flowering perennials mixed in with strong aromatic plants such as Sacred Basil and Lavender together with softer pollen and nectar producers,” Basdew said.

**To participate in the study or for further information please contact [iona.basdew@sugar.org.za](mailto:iona.basdew@sugar.org.za)**

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