

DRONES SPUR SMALL-SCALE FARMERS TO REACH NEW HEIGHTS

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Welcome to the future – drones are here to revolutionise sugarcane farming, much to the exhilaration of small-scale growers (SSGs) who stand to benefit greatly.

The South African Sugarcane Research Institute (SASRI), one of the leading facilities of its kind in Africa and the whole world, has initiated a project to explore the application of chemical ripeners with drones to small-scale grower cane fields. The project took flight in April this year. "The recent entry of crop spraying drones into the SA sugarcane industry brings exciting chemical ripening opportunities to the SSG sector due to the technical ability of these drones to operate effectively within a fragmented, irregularly-shaped, small-field environment," explains Riekert Van Heerden, project leader and a senior scientist (sugarcane physiology) at SASRI. He adds: "In the large-scale grower (LSG) sector within the South African sugarcane industry, chemical ripening has been a long-standing strategy to increase cane quality (RV%) in immature crops. In stark contrast, SSGs have been nearly completely deprived of the benefits that chemical ripening brings."

This development has been welcomed and hailed by both the South African Cane Growers' Association (SACGA) and the South African Farmers Development Association

Below: Dr Riekert van Heerden (Top row, third from the left) with members of the small-scale grower community at the Empangeni grower day.

(SAFDA). "The project model that was presented by SASRI of using drones instead of conventional aerial application methods was impressive and showed more potential to working in SSG fields, as they are smaller and scattered around as compared to large-scale sugarcane fields. The use of drones to apply chemical ripeners on SSG fields has great potential to help SSGs improve and increase sugar content from their sugarcane. This will result in SSGs getting improved RV% and will have great impact on cash flow," says SACGA Development Manager Makhosazana Dlamini.

SAFDA Agricultural Specialist Gordon Spalding remarks: "SAFDA's Farm Management Services Company is excited about the exploratory work we are carrying out with leading drone agricultural crop spraying pioneers. A large percentage of our growers are in remote parts of the province and tend to farm small plots of land making scales of economy unrealistic when moving machinery and inputs to undertake agricultural operations. We are learning that the GPS enabled drone provides accurate precision and spot spraying capabilities that are ideally suited to our farmers needs by improving agricultural productivity and sustainability at costs significantly below conventional methods."





Dr Riekert van Heerden and Tshililo Ramusandiwa (SASRI Assistant Research Officer) explain the purpose and objectives of the participatory drone ripener trials to members of a small-scale grower community in the KZN Midlands.

According to Van Heerden, the project objectives are:

- a) To develop regional partnerships between all the relevant role-players (SASRI ripener specialist, SASRI SSG extension specialists, DARD agricultural advisors, SAFDA and SACGA representatives, regional mill/CTS representatives, crop spraying drone contractors and SSG harvesting/transport contractors) needed to advance cane quality management in the SSG sector;
- b) Through these partnerships to develop an approach consisting of informed ripening decision-making, state-of-the-art ripener application via drones, and harvest scheduling needed to advance cane quality management in the SSG sector;
- c) To implement this approach on a pilot scale in selected SSG regions through a series of participatory demonstration trials;
- d) To quantify the economic benefit that the advancement of cane quality management brought about within these SSG regions.

“The first step in this project is to establish regional partnerships between all the role-players required to fulfill the objectives of the project in the various SSG regions. A phased approach will be implemented covering different SSG regions in each year of the project. These partnerships will involve the SSG co-operators, SASRI ripener specialist, SASRI SSG extension specialists, DARD agricultural advisors, SAFDA and SACGA representatives, regional mill/CTS representatives, crop spraying drone contractors and SSG harvesting/transport contractors. Project implementation workshops, with the regional partnership members as participants, will be convened in each region to establish mutual working agreements and to develop a fit-for-purpose approach for pilot-scale implementation,” he explains.

Van Heerden further states: “The advantage of this project is that, for the first time ever, the benefits of chemical ripening can be demonstrated to SSGs. Numerous SASRI research trials, and several participatory demonstration trials conducted under both rainfed and irrigated conditions on LSG farms, have unequivocally shown that chemical ripeners substantially increase RV% and RV yields in sufficiently immature sugarcane crops. Growers who adopt chemical ripening best practice benefit under the relative RV cane payment system. Besides the relative RV benefit, these growers also unlock RV yield potential on their farms because they are capable of combatting low cane quality, which is an inherent problem in high yielding crops during certain parts of the milling season. The availability of crop spraying drones now enables SSGs to also start to reap the economic benefits associated with chemical ripening.”

The use of drones are starting to benefit LSGs and it is hoped that this will also be the case for SSGs, thereby positively contributing to the sustainability of SSGs, who are usually the hardest hit by serious external challenges facing the industry. “Over the past few years, the efficacy of crop spraying drones has also been assessed in the South African sugarcane industry. A number of LSG participatory demonstration trials have been conducted to confirm the suitability of crop spraying drones for chemical ripening of sugarcane under commercial conditions. The economic results obtained in these trials have been very favourable with increases in gross margin monetary returns ranging between R4000 - R8800/ha.” He stresses: “Provided SSGs are properly educated on the judicious use of chemical ripeners, so that only fields in need of these chemicals are sprayed, there is a lot of potential for reaping similar economic benefits by these growers.”

Dlamini emphasises that it is incumbent on all stakeholders to ensure that the drone project succeeds. “It is important to incorporate all stakeholders who work with SSGs in each area including growers for greater impact and success of the project,” she adds. Spalding also expresses the importance of stakeholder involvement, adding that SAFDA is committed to the success of the project.

Van Heerden concludes: “The first series of project implementation workshops held along the KZN South Coast were very well attended by all relevant stakeholders. Feedback received from the participants indicate overwhelming support for the project (which will continue until 31 March 2023).”