



Sweet Success

Case study

Background

To date, 85% of South Africa's electricity is generated via burning coal, resulting in significant greenhouse gas emissions. State-owned Eskom supplies up to 95% of South Africa's electricity, however, a third of its power stations are undergoing maintenance.

This has resulted in widespread "load-shedding" which regularly leaves up to 50% of people without power, impacting basic services including running water, cooking and sanitation, resulting in economic impacts such as urban poverty and unemployment.

Bio-energy offers a fantastic renewable alternative to fossil fuels for South Africa. As biomass grows, it absorbs carbon from the atmosphere, which is then released when incinerated, making it carbon neutral.

Sugarcane is an example of a crop with bio-energy potential. Sugarcane in South Africa is a significant contributor to the national economy, ranking in top 15 of 120 sugar-producing countries. Sugarcane is expected to increase by 3%, with raw sugar production expected to increase by 9%. The industry produces approx. 2.2 million tons of sugar per season, with 60% marketed in Southern African Customs Union and remainder exported. The sugar industry creates approximately 85,000 direct jobs, which represents 11% of the total agricultural workforce in South Africa.

Innovation story

Over the last year, the UK Agri-Tech Centre has worked collaboratively alongside AgriSound and Grow Your Own Systems, on an international UK – South African R&D project entitled 'SWEET SUCCESS' with the aim of driving the net zero transition by accelerating bio-energy production in South Africa.

The Sweet Success project responds to the bio-energy demand and the just and inclusive net zero transition, by utilising the consortium's unique capabilities and innovations to increase yields of bio-energy crops, subsequently aiding energy generation, whilst not compromising land-use for food and housing.

The project aims to combat a major cause of sugarcane loss by adapting and deploying innovative acoustic monitoring technologies to track sugarcane stalk borers for actionable outcomes, and investigate urban land areas for expanding bio-energy production that would otherwise be inappropriate for housing and food through introducing innovative low-cost hydroponic technologies.



"We took a bold step into uncharted waters with this project and stumbled upon a new world of opportunity for agriculture in non arable areas."

Carine Kroukamp, Managing Director at Grow Your Own

Collaboration and support

Funded by Innovate UK, the SWEET SUCCESS project received over £200,000 in funding from the African Innovation Collaborations for Net Zero Places to look at enhancing renewable energy generation. Through collaboration between the UK Agri-Tech Centre, AgriSound and Grow Your Own systems, the project delivered a live demo site using the Grow Your Own low-cost hydroponic technology alongside AgriSound's PollyTM acoustic based technology to combat a major cause of sugar cane loss.

The project has demonstrated that sugarcane can be grown using Grow Your Own hydroponic technology with faster germination, growth rate and increased yield. The correct flow rate and nutrient mix have been determined, and power and pump requirements have been refined, and an app based system has been developed to track nutrient mixture remotely. Furthermore, soil borne diseases were eliminated using the Grow Your Own hydroponic system.

A total of 118 AgriSound PollyTM sensors were deployed in sugarcane crops across KwaZulu Natal. PollyTM hardware functions as a low-cost listening device, equipped with bioacoustic algorithms (edge computing) to detect sugar cane stalk borer visitations. In addition to microphones, the device also contains environmental sensors (temperature, humidity and light). For very quiet sugar cane stalk borers and/or sugar cane stalk borers requiring active 'luring' using pheromone traps, hardware can be installed into conventional sugar cane stalk borer trap designs.

The demo site was set up near Camperdown, an urban settlement in Umgungundlovu Municipality, KwaZulu-Natal, South Africa. The town is rapidly expanding but has challenges regarding urban poverty, rising youth unemployment and lacks employment opportunities especially for women. In South Africa, the agriculture industry is particularly male dominated, with few opportunities for women, despite 46.4% of households being female headed. This is due to inequalities regarding land, capital, water and extension support.

During the project, the team was keen to address Gender Equality and Social Inclusion barriers in Camperdown, and as such, offered full hydroponics and agribusiness training to 17 local women, resulting in 3 businesses being established as a direct result of the training.

The demo site was also opened up to stakeholders from across the supply chain in November 2024

