Next Generation Solutions to Reducing Losses and Enhancing Safety …

Post-Harvest, Technology and Agro-processing of Horticultural Crops

26th, 27th and 28th March 2025 • The Premier Hotel Seapoint • Cape Town

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2 CPD POINTS

SACNASP South African Council for Natural Scientific Professions

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Accreditation

AgriSETA

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Dear Delegate

Food loss and waste occur at every stage of the supply chain, from production to consumption, with each participant contributing to some degree of loss. In South Africa, significant food losses occur during the production and immediate post-harvest phases, accounting for 25.2% of total losses. These issues stem from inadequate technology, poor post-harvest handling practices, and inefficiencies in food supply chains. Conversely, in developed countries, advancements in mechanisation and post-harvest technologies, such as cold storage, have minimised post-harvest losses to less than 10%. However, they face higher losses during the retail and consumption stages.

According to the United Nations, the global population is projected to reach 9 billion by 2050. During this time, Africa's population is expected to double from the current 1.2 billion to 2.5 billion. To satisfy the food and nutrition needs of this growing population, food production will need to increase by 70% under current trends. This increase requires additional resources—such as land, water, energy, and other agricultural inputs—that are already scarce and difficult to expand.

One effective strategy to enhance food availability is to improve the utilisation of food that is already produced. Currently, it is estimated that about one-third (30%) of food intended for human consumption is lost or wasted globally throughout the supply chain. This amounts to approximately 1.3 billion metric tons, based on limited data regarding food loss and waste, which is likely an underestimate.

Food Losses and Waste (FLW) impact food security and nutrition in three ways: 1) reduction of global and local availability of food; 2) a negative impact on food access, for those who face FLW-related economic and income losses, and for consumers due to the contribution of FLW to tightening the food market and raising prices of food; and 3) a longer-term effect on food security results from the unsustainable use of natural resources on which the future production of food depends.

- The summit on Post-harvest Management will focus on sustainable technological and re modelling strategies around reducing losses in the agricultural chain.
- A dynamic platform will be introduced aimed at bringing together diverse stakeholders in the food supply chain including farmers, transporters and traders.
- The overall aim of summit is to create a discussion forum where technology developers and promoters can interact with presenters/experts with an ultimate goal of scaling up for wider adoption in an enabling policy environment.

Join us for two engaging workshops on Day 3:

- Reducing Losses Among Small-Scale Farmers
- Agro-processing and Post-Harvest Technologies

Don't miss out on these interactive sessions!

- Success stories of technologies, practices, strategies and models that have worked to reduce food losses in the South African context will also be showcased and presented.

Participants will be drawn from a diversity of stakeholders across South Africa who are involved in the food sector. This includes farmers, traders, researchers, academia, innovators, policy makers, development partners, government departments, private sector/investors, amongst others as listed below:

- Relevant government departments representatives (Department of Agriculture)
- Universities/Tvet colleges/Agricultural Schools (Department of horticulture, Plants, Post-harvest Pathology/Physiology, Biotechnology, Microbiology
- Research Organisations
- Development agencies
- Funding organisations and banks
- Private Sector organizations/companies
- Regulatory Bodies
- Exporters
- Farmer/Producer Organisations
- Packhouse Managers/Operations/Owners
- Cold Chain Transport and Logistics
- HVAC Aircon companies
- Refrigeration Engineers
- Technology promoters/distributors/partners
- Packaging material manufacturers
- Commercial/ Small Scale Emerging Farmers
- Extension Officers

The Summit will provide an excellent platform for researchers, academics, farmers, development agencies and policy makers to learn, share information, build networks and partnerships with the overall objective of identifying effective strategies and interventions to reduce losses.

The objectives of the summit are as follows:

- Fighting Food Loss with Data: How Post-harvest is Revolutionising Fresh Produce Management.
- Identify Post-harvest Gaps Within the Supply Chain

What are the "Skill Gaps" and "Technology Gaps" within the Sector?

- Advances in Post-harvest Packaging and Technologies: Machine Learning, AI…Biosensors, and Blockchain Technologies for Smarter Post-harvest and Agro-processing Systems.
- "A Packhouse Perspective" on Post-harvest Challenges.
- Post-harvest Losses in Small Holder Farmers
- How Integrated Post-harvest Technologies Combined with Environmentally Friendly Disinfection Treatment and Evaporative Cooling have Proven Effective in Extending the Shelf life of Horticultural Crops
- Post-harvest Management Technologies: Enhancing Shelf Life and Quality.
- Biological Control and its Role in Management of Post-harvest Diseases.
- Can Gene Editing reduce Post-harvest Waste and Loss of Fruit, Vegetables, and Ornamentals?
- Post-harvest Pathology: Next Generation Solutions to Reducing Losses and Enhancing Safety
- Reducing Post-harvest Losses in Africa: Training for Extension workers, Technical Specialists and Field Practitioners.
- Advance Packaging to Overcome Post-harvest Losses
- What is the Climate Smart Techniques Needed to Implement to Reduce Post Harvest Losses?
- Rethinking Post-harvest Management Interventions and Strengthening Policies in Ensuring Food Security.
- Insight into Success stories and Case studies on: Reducing Post-harvest Losses and ensuring Food Safety in South Africa
- Innovative Post-harvest Strategies for Maintaining the Quality of Food During Storage.
- Post-harvest Loss, Causes, and Handling Practices of Fruits and Vegetables.
- To Provide a Solution Roadmap to Reduce food Loss Along Your Post-harvest Supply Chain
- Monitoring of Controlled Atmosphere as Cold Chain Support for Extending Post-harvest Life.
- Addressing Post-harvest Losses Through Agro-processing for Sustainable Development.

For more information contact Ryan on 073 946 9796 | Email: Ryan@empiretraining.co.za

2025 MEET THE EXPERTS

DAY ONE: 26th MARCH 2025

CHAIRPERSON: Nitasha Baijnath-Pillay | Resource Management & Sustainability Manager **|** Hortgro

Dr Cheryl Lennox
Stellenbosch University
Cheryl Lennox obtained her PhD in Plant Pathology from the University of Kwa-Zulu Natal. Cheryl was appointed senior scientist and programme manager of the Weeds Pathology Unit. In 2008, Cheryl joined the department of Plant Pathology, Stellenbosch University, and established the Fruit and Postharvest Pathology Research Program.

08:30-09:15 Post-harvest Disease and Control

Post-harvest decay impacts significantly on quantity and quality of deciduous fruit crops produced in Southern Africa.
Delve into this session as we explore the strategies on how to manage Post-harvest losses.

Professor Ryk Rues
Central University of Technology
Professor Ryk Lues is a highly acclaimed Food Safety Professor and Director of the renowned Centre for Applied Food Sustainability and Biotechnology (The Central University of Technology), with his exceptional expertise in social-behavioural aspects impacting food safety, organisational food safety culture, and food safety innovations, he has made a name for himself in the field.

09:15-10:00 Regulatory and Safety Measures
Enhanced Food Safety Standards: With increasing global trade and the complexity of supply chains, food safety measures will become stricter. More emphasis will be placed on sanitisation, traceability, and monitoring systems to ensure that produce is free from contaminants and meets international standards.

10:00- 10:15 TEA BREAK

TECHNOLOGY TRACK

Mr Samuel Jacobs,
Head Business Executive
Energy Partners HVAC and Refrigeration
Samuel has concentrated expertise over the last 15 years with a particular focus on Servitisation, Sustainability and Energy efficiency in cold chains. He is currently the programme lead for South Africa's demonstration pilot programme to phase-out hydrochlorofluorocarbons (HCFCs) out of refrigeration and ventilation systems and introduce natural refrigerants as part of South Africa's obligation towards the Montreal Protocol.

10:15-11:00Fresh from farm to table: How Cooling-as-a-Service can solve Africa's cold chain challenges
Food loss and wastage have far-reaching effects on communities and the economy. These issues can be tied to loss of revenue for farmers and more broadly, the wastage of water, fertilisers, energy and land. Furthermore, in light of the fact that as per recent estimates, one in every five Africans face hunger,solving the cold storage conundrum is a continental imperative.
The answer could lie in servitisation – and more specifically, Cooling-as-a-Service.

Mr Pieter Pienaar
Founder and CEO of Informed Decisions as well as the Chairman of the IoT (Internet-of-Things) Industry Counsel.
Pieter, an entrepreneur fuelled by a passion for problem-solving! After years in the corporate world, he launched Informed Decisions, driven by a vision to revolutionize technology. Collaborating with top international clients, he and his brilliant partners developed next-generation LPWAN technology, now proven across multiple industries worldwide.

11:00-11:45 Implementation of IoT to Minimize Post-harvest Losses
- IOT (Internet of Things) solutions are increasingly being used to address the issue of post-harvest loss, particularly in agriculture.
- Post-harvest losses can occur due to various factors such as improper storage, poor handling, inefficient transportation, and lack of proper monitoring during the entire supply chain.
- By integrating IoT technology, farmers and supply chain operators can minimize these losses and improve the overall efficiency of agricultural systems.
- Several IoT solutions that are being used to reduce post-harvest loss will be discussed.

Dr. Honest Machekano
University of Pretoria
Dr. Honest Machekano, Department of Zoology and Entomology, and an affiliate of the Forestry and Agricultural Biotechnology Institute (FABI) University of Pretoria. He holds a PhD in Biological Sciences specialising in Applied Entomology

11:45-13:00 Proper Post-Harvest Storage and the Use of Smart Technology targeting Insects
Creating a low-cost, climate-smart technologies tailored for small-scale farmers in South Africa. "Through investment in such research UP plays a leading role in addressing storage deficits at grassroots level, creating awareness on FLW and generating knowledge that can be used as a basis for future national food policy adjustments to mitigate FLW.

13:00-14:00 LUNCH

Mr Ken Treloar
Aerobotics
Ken Treloar(MBA, BTech) is an author, AgTech advocate, and Drone Data Technologist with nearly a decade of experience helping farmers leverage cutting-edge technologies. As part of Aerobotics, a leader in AI-driven agricultural solutions, Ken supports global farming operations with drone and cloud-based tools that deliver impressive results.

14:00-15:00 Smart Harvesting and Sorting Technologies
Fighting Food Loss: A Proactive Focus on Quality Using Drones and AI. Production challenges including crop quality and yield have real-world knock-on effects along the supply chain. Including food loss due to unmet standards. This is a presentation exploring the use of remote sensing and advanced A.I mobile application technologies that help fight against harvest and post-harvest food loss proactively.

15:00-15:15 TEA BREAK

Dr Peter Johnston,
Climate Scientist University of Cape Town
Dr Peter's research focuses on the applications and impacts of climate variability and change on various user sectors. He specialises in agriculture and water related activities with special emphasis on vulnerability and adaptation options. He has worked closely with the Western Cape Government in developing a climate change vulnerability study and this was followed by a strategy and action plan

15:15-16:00 Climate Change: A Challenge for Post-harvest Management, Food Loss, Food Quality, and Food Security
Climate change has a strong impact on the food industry as it affects cultivation, post-harvest
management (PHM), food loss, food quality, and food security. Changing climatic factors (temperature, rainfall, greenhouse gases (GHGs)) have a significant impact on post-harvest quality parameters of fresh produce, specifically with respect to the integrity of the value chain.

Mr Gavin Marshal
Founder of Hippytech

16:00-16:45 What is the role of blockchain in minimizing post-harvest losses?

17:00 END OF DAY ONE

DAY TWO: 27TH MARCH 2025

CHAIRPERSON: Nitasha Baijnath-Pillay | Resource Management & Sustainability Manager **|** Hortgro

	**Mr Norman Nieder** Heitmann: Gossamer Packaging Machinery Is an Industrial Engineer turned Salesman who currently serves as the Business Development Manager at Gossamer Packaging Machinery. His focus is on driving strategic growth and managing key accounts within the packaging automation industry. With over a decade of experience spanning process engineering, customer success, and business development, Norman brings a unique perspective to automation	**09:15-09:45 Sustainable Packaging** **Edible Packaging:** As part of the growing sustainability movement, edible packaging will be developed to reduce waste. Made from natural plant-based materials, these could replace plastic, ensuring that the packaging itself is biodegradable or even edible. **Smart Packaging:** Packaging with embedded sensors that can detect changes in temperature, humidity, or even spoilage levels will become common.This will help to monitor the freshness of the produce throughout the supply chain and provide consumers with better quality products.
	**Prof Malcolm Dodd -Director** ColdCubed Solutions Currently a Director of Coldcubed and Cold Chain Solutions (Pty) Ltd. Both businesses associated with innovation in cold chain management and associated technologies. Prior to this, Malcolm acted as a consultant to multi-nationals such as Thermoking and Maersk and local companies on atmosphere modification and refrigeration techniques for long distance transportation of perishables	**09:45 -10:30 Packaging of the Future: Integrated Model-based design and Performance Evaluation of Packaging** The primary purposes of packaging are to transport and store food while shielding it from contaminants, chemicals, air, moisture, and light to maintain its quality and safety and lengthen its shelf life. Despite the fact that there are several causes of food loss and spoiling, this session will concentrate on how to develop solutions for smart packaging, which can improve food quality and safety by minimizing food loss.

10:30-10:45 TEA BREAK

	**Prof Asanda Mditshwa** University of Kwa-Zulu Natal Prof Mditshwa is a postharvest expert and he holds a PhD in Horticultural Sciences. His research is focused on postharvest physiology and technology with special interest on finding effective non-chemical technologies for preserving quality and extending shelf-life.	**10:45-11:30 Emerging Innovative Post-harvest Technologies** The use of synthetic post-harvest treatments has serious implications for environmental and human health. This session explores such of the innovative and environmental-friendly technologies for reducing food losses.
	**Dr Lizyben Chidamba** University of Pretoria Is an Agribusiness specialist with extensive research experience in food systems, food security, microbiology, food safety, plant pathology and bioinformatics. He holds a PhD in Crop Protection from the University of Pretoria	**11:30-12:15 Impact of post-harvest loss on food security** Effective post-harvest management is an important opportunity for progress towards achieving food security–the technologies exist, there are success stories in several parts of the world, there are business opportunities. We need coherent action by multiple actors, access to finance, and policy support.
	**Mr Braam Mouton** Dutoit Agri Experience includes research involving different systems for controlled atmosphere (CA). He holds a BScAgric. Crop production systems (Horticultural science & Plant pathology) from the University of Stellenbosch	**12:15-13:00 Post-harvest Losses: Horticulture in the Circular Bioeconomy** Strategies for mitigation of Post-harvest losses in Horticulture; Economic, social, and environmental consequences of post-harvest losses across the food chain; Technological innovations: Product and Process innovations

13:00-14:00 LUNCH

	**Dr Suzan Oelofse , Principal Researcher** CSIR Prof Oelofse obtained a PhD degree in Botany in 1994. After a short career in botany, she worked in a policy development and regulatory environment in the waste and water sectors for 10 years. She joined the CSIR in a research capacity 2006. Her research interests include the institutional and legal framework within which waste is managed in South Africa; waste information and data; re-use of industrial waste streams and reducing the environmental impacts of waste. The focus of her research over the past 13 years was mostly on municipal solid waste and food waste.	**14:00-14:45 Integrated water management and its significance prior to, during, and after harvesting of fresh horticultural produce.** Optimal recirculation of water used during postharvest washing, precooling, and sanitation of fresh produce reduces waste of water while avoiding pollution that can happen when wastewater contaminated by chemicals normally applied during postharvest handling is discarded. However, research on optimal ways of linking water management at different postharvest stages and wastewater recirculation in postharvest handling of fresh produce is limited.
	**Dr Anel Botes** Agricultural Research Council Dr Anel is the chief post-harvest researcher in the Post-harvest and Agro-processing Technologies Division at the ARC Infruitec-Nietvoorbij. Research interests involve both basic and applied aspects of fruit physiology.	**16:15-17:00 Reduction of the incidence of post-harvest quality losses, and future prospects** Quality cannot be improved after harvest, only maintained; therefore, it is important to harvest fruits, vegetables and flowers at the proper stage and size and at peak quality
	**Elrita Venter CEO** AgriEdge Experienced professional with a proven track record of engagement and comprehensive knowledge across all facets of the fresh produce value chain. This includes expertise in plant material selection (importation) and propagation (nursery), production, and export. Proficient in the technical intricacies of Market Access initiatives for fresh produce, particularly concerning SPS (Sanitary and Phytosanitary) matters, supported by a PhD in post-harvest Plant Pathology.	**15:30-16:15 post-harvest fruit loss and waste in speciality crops: A producer's perspective** Producers play a critical role in managing post-harvest food loss. Their decisions and practices at a production level significantly impact their crop's quality, shelf life and marketability. The responsibilities and impact though, continue along the value chain with various challenges contributing to food loss and wastage - How do we define responsibilities and effectively manage to reduce losses, improve sustainability, and simultaneously enhance profitability and food security?

DAY THREE: 28TH MARCH 2025: WORKSHOPS

WORKSHOP A : 09:00-12:00 REDUCING LOSSES AMONGST SMALL-SCALE FARMERS

Ms Tintswalo Mololekoa
University of Pretoria

Ms Manoshi Mothapo
Agricultural Research Council

Smallholder farmers and rural communities heavily depend on the income generated from selling surplus crops. However, post-harvest losses prevent them from earning a sustainable income, destabilizing their economic situation and trapping them in the cycle of poverty. Small-scale farmers are particularly vulnerable to these losses due to limited access to proper storage, infrastructure, and technologies. To tackle post-harvest losses and improve food security, a range of interventions should be implemented.
On its journey from farm to table, food is often lost along the way, a phenomenon known as food loss or post-harvest losses. This occurs when agricultural products, such as cereals or meat, never reach the market. For small-scale farmers, this results in significant losses, affecting their livelihoods and food security.

The objectives of the workshop will address the following:

- **Accessing Finance:** By improving access to finance, small-scale farmers and cooperatives can invest in post-harvest facilities and equipment, such as packing houses or threshers, to reduce food losses.
- **Linking Farmers to Markets:** Farmers are less likely to invest in equipment and activities that reduce food losses if they cannot make a profit. Connecting farmers to markets ensures a steady stream of buyers, minimizing food loss.
- **Improving Storage for Grains:** Insufficient storage can lead to infestations, microbial infections, and moisture-related damage, resulting in crop losses. On-farm storage technologies, like metal drums and hermetic bags, can virtually eliminate grain losses when used properly.
- **Upgrading Grain Drying Equipment:** Improper drying leads to mould and spoilage, causing major grain losses. Providing farmers with drying equipment, from simple tarpaulins to more advanced shelters, is crucial to reducing these losses.
- **Cold Storage for Fresh Produce:** Fresh produce, such as fruits, vegetables, fish, meat, and milk, faces the highest levels of spoilage, often due to inadequate cooling infrastructure. Supporting farmers with cold storage equipment can greatly reduce fresh produce losses.
- **Strengthening Transport:** In remote areas, poor transportation infrastructure prevents farmers from reaching markets on time, increasing the risk of produce damage. Improving transport connections to rural areas can significantly reduce food losses.
- **Building Commercial Storage:** Collective storage facilities allow farmers who cannot afford individual storage options to safely store their crops. Shared facilities, when well-maintained, provide a cost-effective way to prevent losses.
- **Training Farmers:** Educating farmers on post-harvest handling and storage such as proper harvest timing, drying, moisture management, and safe storage techniques is essential for reducing food losses.
- **Collecting Data:** Accurate data on food losses and their causes is necessary to identify and target effective interventions.
- **Developing Policies:** Long-term political commitment to reducing food losses can be achieved by incorporating this goal into national agricultural strategies. This may require governments to provide financial and technical support.

Outcomes: These actions, when combined, can help reduce post-harvest losses and move us closer to achieving food security and ending hunger in the region.

12:00-13:00 LUNCH

WORKSHOP B: 13:00-15:30 Agro-processing and post-harvest technologies

Dr Tumisi BJ Mololekoa
University of Johannesburg

In our country, food security is a challenging issue. Meeting the food and nutritional requirements of the people has become an issue for national policymakers and is of public concern. There is a critical need to enhance agricultural production, as well as, to reduce post-harvest loss, improve the quality of processed products, and add value to products to make more quality food available. Agro-product processing technology plays a major role to reduce post-harvest losses, improve the quality of processed products, and agro processing of fruits and vegetables enhances their overall acceptability, utilization, handling, storage, and transportation, thereby reducing food loss and waste. By processing these products, the availability of key nutrients and bioactive compounds is increased, improving their bio-absorption and utilization in the body value to the products. It also generates employment and ultimately contributes to food security.

The objectives of the workshop will address the following:

- Post-harvest losses in agriculture threaten food security and economic growth.
- Agro-processing adds value and transforms raw products into processed goods.
- Exploring Agro processing potential aligned with existing policies.
- Techniques like drying, canning, freezing, and packaging minimize losses along the value chain.
- Integrated policies, improved infrastructure, technology, and collaboration for sustainable development.

Outcomes: The workshop aims to address the significant challenges faced by farmers in managing their post-harvest losses, while also exploring opportunities in agro-processing to enhance food security, improve livelihoods, and reduce waste.

Post-Harvest, Technology and Agro-processing of Horticultural Crops

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