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KAISP final workshop – Advances in technology for avocado production in Kenya – Focus group industry priorities

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This report is a compilation of the constraints to production and bottlenecks in the value chain, as well as priorities for research and investment and focal areas of interest and needs for the Kenyan avocado sector. It originates from 16 interactive focus group sessions held simultaneously during an avocado production technical workshop. Participants consisted of a diverse range of stakeholders throughout the avocado value chain in Kenya, plus a few participants from Uganda. The Kenya Avocado Industry Support Project (KAISP) project team were so impressed with the energy and passion with which the stakeholders conveyed their messages, we thought it important to document and share the findings, with hope for further investment and implementation in the areas most critical to the strengthening of the sector.

1 Workshop summary

After 10 years of working on the ground in Kenya, the KAISP team held a final workshop in Nairobi in May 2023 to celebrate and extend the key outcomes from the project work with their collaborative stakeholders. The two-day event was well supported and the high level of interaction, engagement, positive feedback and thirst for knowledge was testament to the practical solutions to production and industry issues that this project has produced during the last decade.

The workshop, representing the final activity of the project, aimed to present to stakeholders the key advances in knowledge and technology that KAISP has delivered to the Kenya avocado industry. Activities delivering new or novel technologies with the potential to significantly transform the industry were presented in detail (see Appendix for programme), these included:

1. The risk to the industry by phytophthora root rot and the concept of phytophthora-free nursery stock and its value to growers and the industry.
2. Meeting the challenges of fruit quality and market reputation by understanding the importance of fruit maturity and introducing a novel (world first) predictive model (Time to Harvest - TTH) that can predict target maturity, expressed as % dry matter (DM), for any avocado producing region and altitude in Kenya.

3. Addressing the question of reputation and sustainability of the Kenya avocado industry, integrating growing consumer concerns around issues of biodiversity in orchards, and water use by the crop. The KAISP Water Use and Irrigation Needs Model that matches rainfall with potential water requirements for over 7000 villages in the avocado areas was introduced. The model allows county governments and other agencies involved with avocado development to identify areas most suited to avocado production in relation to rainfall versus evapotranspiration rates and the potential for supplementary irrigation.

The PowerPoint presentations delivered during the workshop can be viewed at the following link: https://drive.google.com/drive/folders/1olL7N7bn1ZE1BtGu2XW0cbTG0Pw6YAlU.

The workshop was held at the conference facility at Kenya Agricultural and Livestock Research Organisation (KALRO) Headquarters in Nairobi, which aptly reflected the close collaboration between KAISP and KALRO over the 10 years of the project and the ongoing the support of the Director of Crops Research Dr Lusike Wasilwa. The workshop was introduced by Dr Wasilwa, and officially opened by Mr Seamus Dunn, New Zealand Deputy High Commissioner to Kenya.

2 Participants

The workshop was attended by a broad cross-section of stakeholders including growers, nursery operators, exporters, marketers, NGOs, agronomists, county agricultural officers, and national government agencies including Ministry of Agriculture, Livestock, Fisheries and Cooperatives (MALFC) agriculture officers, policy officers; KALRO research scientists, Horticultural Crops Directorate (HCD), Kenyan Plant Health Inspectorate Service (KEPHIS), college lecturers and trade advisory services.

The number and diversity of participants, the level of interest and the degree of audience participation in the open forum discussions for each of the sessions exceeded expectations. Details of attendance are shown in Table 1.

Table 1. Attendance records for Kenya Avocado Industry Support Project (KAISP) workshop, Kenya Agricultural and Livestock Research Organisation (KALRO) Headquarters, 23–24 May 2024.

	In person	Zoom	YouTube views	Total
23 May	184	100	153	428
24 May	139	161	615	960

KAISP has always been all-inclusive in its attitudes and knowledge sharing. This was evident by the strong support shown by a cross-section of industry stakeholders attending the workshop. Participants comprised 38% women from all manner of vocations including scientists/researchers, traders, processors, marketing, agronomists and farmers. Furthermore, some participants (of both genders) had travelled long distances from very remote locations to attend the workshop, including from neighbouring Uganda. All approached the event with a highly collaborative attitude and were given the opportunity to ask questions and give feedback as to their thoughts on the strengths, constraints and direction the industry should be headed and how to get there.

2.1 Stakeholder group feedback for industry consideration

An interactive group session on Day Two gave all participants the opportunity to voice their priorities and concerns for the avocado industry, which we have summarised in this document. The process involved each table (~10 people) working as a group to brainstorm what they considered to be the technical and regulatory priorities for the future of the avocado industry. Every group answered a set of questions relating to either production, or to the value chain, which were randomly assigned to tables. The questions were as follows:

1. What do you see as the greatest constraints to production of avocado in your region/country?
    - Ideas to address this at producer/county/national level
    - Areas of focus you would like to see for research, development and extension
    - Specifically what technical information would be most useful for you.
2. What do you perceive to be the major barriers and deficiencies in the avocado value chain?
    - Ideas to address this at producer/collector/marketer/processor/county/national level
    - Areas of focus you would like to see for research, development and extension.

All groups were also asked to discuss:

3. What do you consider to be the major strengths of the avocado industry in Kenya?
    - How would you build on this further?
    - Ideas to ensure the viability and sustainability of the industry into the future.

3 Summation of group responses

3.1 Constraints to production and recommendations for investment

Eight groups discussed what they believed to be the greatest constraints to avocado production in their region/country. The groups comprised participants from different areas of expertise including farmers, researchers, marketers and policy makers. The five most common responses were as follows:

1. Clean planting material from certified nurseries – a lack of access to clean (phytophthora free) seedlings is a producer level constraint that has effects felt throughout the value chain.
2. Cost of production – specifically rising costs of production inputs like irrigation and fertiliser was a recurring concern. Further along the value chain costs, faced by marketers and processors were also identified as limitations.
3. Lack of knowledge – and/or poor knowledge transfer between different value chain actors is another constraint to production and there is demand for more training and capacity building.
4. Climate change – participants did not elaborate on what specific aspects of “climate change" were of concern but identified the need for tools and training to adapt to environmental change.

5. Pest and diseases – in addition to phytophthora root rot, the industry is concerned about pest and disease management more generally and developing biocontrol agents and integrated pest management plans.

Other recurring themes included limited land resource, theft, subpar infrastructure, lack of technical support and tech adoption, postharvest losses, mono-variety cropping and agronomic practices.

Table 2. Ideas to address constraints to production, areas of focus for R&D and extension and useful technical information.

Ideas to address these constraints	Areas of focus for research, development and extension	Useful technical information
Good agricultural practices for pest and disease control	Value addition through use of technology	Fruit maturity testing protocols
Empowerment of enforcement bodies	Pests and diseases management (phytophthora, IPM)	Agronomical advice, water, heat, light, input per tree
Capacity building for farmers	Consumer and market trends research that influences production	Postharvest handling
Climate-smart agriculture (especially irrigation systems and water conservation)	Broadening the gene pool; assessing suitable varieties or cloning quality seedlings	Appropriate varieties
Use of social media to distribute content	Zone-specific production; relationship between altitude, temperature and maturity	Timetable for soil nutrition
Traceability mechanisms		
Contractual farming		
Youth involvement in industry		

3.2 Major constraints in the avocado value chain and recommendations

A second set of eight groups discussed the major barriers and deficiencies in the avocado value chain in Kenya. Again, the groups were comprised of participants with different areas of expertise. The five most common responses were as follows:

1. Lack of physical infrastructure – particularly for postharvest and logistics , examples included roads, transport, packhouses and coolstore facilities.
2. Lack of government involvement and regulatory systems – where regulations do exist participants perceive there to be a lack of enforcement. Several groups identified the lack of government involvement at the County level to be a particular barrier.
3. Knowledge gaps throughout the value chain. There is limited knowledge transfer between farmers, researchers and exporters and a lack of extension services to bridge this gap.
4. Sourcing clean planting materials from certified nurseries – as well as being a key constraint to production, this was also identified as a major barrier at the very start of the value chain.
5. Production and environmental factors such as water availability, suitable land, and climate uncertainty.

Other barriers and deficiencies identified in the avocado value chain were a lack of organisational development, theft, traceability, lack of qualified personnel, marketing and market access, and the cost of certification.

Table 3. Ideas to address constraints in the avocado value chain, areas of focus for R&D and extension and useful technical information.

Ideas to address these constraints	Areas of focus for research, development and extension	Useful technical information
Extension services, support and training for farmers	Pest and disease management	Dissemination of research findings to public/industry
Regulation, policy and enforcement	Agronomic practices	Production techniques
Postharvest technologies	Soil type and disease prevalence	Postharvest processing
Private sector investment	Virus and control	
Strengthen marketing channels	Data collection system for decision making	
Access to clean planting material		
Investment in drought mitigation infrastructure, i.e. dams		

3.3 Major strengths of the avocado industry in Kenya

All groups discussed the strengths of Kenya's avocado industry. The top five strengths identified were:

1. Favourable climate and geographical location – most groups regarded the climate in Kenya as being a strength and considered there to be many growing regions in the country to be favourable for avocado production.
2. Willing producers and skilled labour.
3. Government support for industry.
4. Information available – there has been research done on the industry, and stakeholders (KEPHIS, KALRO etc.) are knowledgeable.
5. Taste/quality of fruit.

Other industry strengths include availability of different varieties, growing demand, support from NGOs, peer to peer farmer support.

Table 4. How to build on strengths of the avocado industry in Kenya and ideas to ensure industry viability and sustainability.

How to build on these strengths	Ideas to ensure industry viability and sustainability
Ensure market availability	Government support and involvement in avocado industry, infrastructure, policies, regulation and enforcement
Ensure consistent quality	Access to new, stable markets with good market structure
Dissemination of information and integrated learning (e.g. demonstration plots)	Producing for the organic market
Adoption of technology	Building collaborations and linkages (domestic and international)
Promotion of local eating culture	Good agricultural practices (GAP)
Collaborations and linkages	Grow the domestic market
Increase production areas	Value addition
	Consistent production
	Penalties for non-compliance

4 Concluding remarks

The active engagement from a diverse group of stakeholders in this final workshop and the focus group sessions, was a fair representation of the passion and drive within the avocado sector in Kenya. There is a clear demand for further technical support within the industry and a deep thirst for knowledge, which is paired with a willingness for uptake of new technologies. If the support can be realised, the cumulative gains towards a sustainable industry that not only lifts smallholder livelihoods, but also places Kenya as a reputable exporter of avocado fresh fruit and oil would be significant.

Appendix. Workshop announcement and programme

Kenya Avocado Industry Support Project

FINAL WORKSHOP

'ADVANCES IN TECHNOLOGY FOR AVOCADO PRODUCTION IN KENYA'

May 23-24, 2023

Venue: KALRO Headquarters, Kaptagat Rd, Loresho, Nairobi Kenya




The **New Zealand Institute for Plant and Food Research Limited** (PFR) in partnership with the **New Zealand Ministry of Foreign Affairs and Trade** (MFAT), Kenya Agricultural and Livestock Research Organisation (**KALRO**), Kenya Horticulture Crops Directorate (**HCD**), and **Olivado EPZ Ltd** would like to welcome you to a workshop on 'Advances in Technology for Avocado Production in Kenya' at KALRO Headquarters, Loresho, Nairobi, on 23-24 May 2023.

In 2013, the New Zealand Ministry of Foreign Affairs and Trade, in partnership with The New Zealand Institute for Plant and Food Research Ltd and Olivado EPZ Ltd, initiated the **Kenya Avocado Industry Support Project (KAISP),** aimed at developing and introducing new and improved technologies to support the growth of the avocado industry in Kenya. This workshop marks the end of this project, and it is our pleasure to welcome you all as we present the key outputs from our research, implementation and extension on the ground in the Kenyan Central Highlands, and discuss pathways to ensure a sustainable future for the industry.

Workshop programme

DAY 1 Tuesday May 23rd		
8.30	Registration	
9.00	Welcome and housekeeping	Dr Lusike Wasilwa, KALRO
	Welcome by PFR	Dr Suzie Newman, PFR
9.15	Keynote: Overview of Kenya avocado industry - challenges and opportunities	Willis Audi, Director, General AFA
9.35	Opening remarks	Seamus Dunn, NZ Embassy
9.45	Official Opening	Hon. Cornelly Serem, Chair AFA
10.00	Morning tea	
10.20	Introduction to the Programme	Dr Bob Fullerton, PFR
Session 1: Plant health		
10.30	The Phytophthora story	Dr Ruth Amata, KALRO
10.55	Phytophthora free nursery protocol	Dr Bob Fullerton, PFR
11.20	Value of Phytophthora free plants	David Priest, FIPS
11.55	Plant health forum	Panel + audience
1.00	Lunch Break	
Session 2: Sustainable avocado production in Kenya		
2.00	How Kenyan smallholders could prosper from a challenging horizon	Dr Allan Woolf
2.10	Avocado industry production constraints and sustainability challenges	Dr Anthony Esilaba
2.45	Water needs for avocado in Kenya - is water limiting? Decision support irrigation model	Dr Steve Green
3.20	Biodiversity and genetic conservation for sustainable avocado growing systems	Dr Desterio Nyamongo, Genetic Resources Research Institute
3.55	Maximising Avocado Potential: Research and Market Options	Dr Lusike Wasilwa
430	Sustainability forum	Panel + audience
5.15	Close of Day 1	

Should you wish to join remotely by zoom please click the link below.

Topic: **Avocado Workshop Day 1**

Time: May 23, 2023 09:00 AM Nairobi (EAT)

Join Zoom Meeting
https://us02web.zoom.us/j/89388741047?pwd=N2xZY0dlWkgweWlOSzZXczlRS0dzZz09

Meeting ID: 893 8874 1047

Passcode: 465281

Workshop programme

DAY 2 Wednesday May 24th		
Session 3: Fruit quality		
9.30	Reputation of Kenyan avocado – What the market wants	Gary Hannam
10.05	Importance of dry matter for quality	Dr Allan Woolf
10.40	Morning tea	
11.10	Challenges of fruit 'maturity' and principles of the Time To Harvest (TTH) model	Dr Steve Green
11.40	Demonstration of the TTH tool	Ednah Komen
12.10	Fruit Quality Forum	Panel + audience
1.00 PM	**Lunch**	
2.00	Prioritisation of technical and regulatory needs of avocado in Kenya	All participants
3.00	Evaluation and feedback	All participants
3.20	Acknowledgements	Dr Bob Fullerton
3.30 PM	**Workshop Closing Remarks**	Hosea Machuki, CEO FPEAK

Should you wish to join remotely by zoom please click the link below.

Topic: **Avocado Workshop Day 2**

Time: May 24, 2023 09:30 AM Nairobi (EAT)

Join Zoom Meeting
https://us02web.zoom.us/j/84222699060?pwd=NFlHc0lrci91L1FrZUtiUlFaSm1mUT09

Meeting ID: 842 2269 9060

Passcode: 556844

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