P.O. Box 461
Hillcrest, 3650
Unit 7 – 22 on Main,
22 Old Main Road,
GILLITTS 3610
Kwa Zulu Natal, South Africa
Tel: +27 31 765 2514
Fax: +27 31 765 8029
Email: info@cga.co.za

Citrus Sustainability Forum

27 February 2026

09:00-10:30

DRAFT MINUTES

Welcome

This CSF was focussed on agrochemical residue analysis in the form of a panel discussion with the ISO 17025 accredited laboratories that specialises in this type of residue analyses.

About 70 participants were online during the forum. PB had requested parties to come prepared to respond to questions that were designed to lead the meeting through the relevant topics and challenges at hand. The approach was to deal with the topics in a panel discussion.

Administrative tasks

- André Combrink and Annari Prins sent their apologies.
- No new points were added to the agenda.
- The minutes of the previous CSF (24 October 2025) were approved.

Other matters

1. The international Finance Corporation was asked by a group of retailers to conduct a global survey on the content of audit standards. The aim is to try and establish if standards and/or the certification process can be redesigned or better integrated to drive real economic, environmental and social benefits for suppliers. To participate in the survey, please follow the link:

   https://forms.office.com/Pages/DesignPageV2.aspx?subpage=design&token=32bee4e78db24f919cc2cc6e59a226be&id=soLW_7avskucn1c6EL8YvmGPT5FtTeNLtgm3ldgqot5UMVVJNFdHTVVMMUdDTUIzMzhOSEVWTENPUi4u

2. CGA is aware of ongoing challenges experienced by certification bodies to migrate to the new GLOBALG.A.P. IT platform which may affect visibility of certificates and the validity period of certification. If growers are experiencing any difficulty, please contact your certification body directly and they will gladly assist you. Please refer to the letter from the Perishable Products Export Control Board (PPECB) dated 19 February 2026 for noting provided with the minutes.

Panel discussion with the agrochemical residue analysis service providers

Online: Hearshaw and Kinnes (Ms Sue Kinnes), Labserve (Mr Willem Immelman and Mr Larne Auerswald), Mérieux NutriSciences/Hortec (Mr Wessel Kriek), Microchem (Mr Stephen Newborn), and the PPECB lab (Mr Hein Engelbrecht)

1. **Question: What does the ISO 17025 standard covers and what does it mean when a lab is ISO or SANAS accredited?**

Citrus Growers' Association OF SOUTHERN AFRICA
Grower levies working for you!

P.O. Box 461
Hillcrest, 3650
Unit 7 – 22 on Main,
22 Old Main Road,
GILLITTS 3610
Kwa Zulu Natal, South Africa
Tel: +27 31 765 2514
Fax: +27 31 765 8029
Email: info@cga.co.za

Answer (H&K): The accreditation gives confidence that a lab can accurately and reliably identify and/or quantify molecules. Not to be confused with for example, microbiology labs where there are other ISO standards involved. The ISO 17025 covers from the management system, through to the quality control procedures in the laboratory and measurements of uncertainties. The accreditation cycle is every 5 years with periodic surveillance visits. Independent SANS accessors perform the technical assessments.

2. **Question: Please explain % variation (uncertainty factor) allowed in pesticide residue results. Why is this inevitable and does this still mean that results are accurate if there is an uncertainty factor?**

Answer (Labserve): The uncertainty factor is a range (±) around the reported result where the true concentration of the analyte is expected to lie. This range is determined during method validation and specified in SANTE documentation.

> *SANTE documentation for laboratories refers to a set of guidelines and technical documents issued by the European Commission's Directorate-General for Health and Food Safety (DG SANTE), focusing primarily on analytical quality control, method validation, and residue monitoring in food and feed. These documents are designed to ensure consistent, high-quality analytical results across laboratories conducting pesticide residue analysis.*

An example of a 50% uncertainty factor, corresponding to a 95% confidence level: 0.01 mg/kg ± 0.005 mg/kg, meaning the true concentration of the analyte is between 0.005 and 0.015 mg/kg and when comparing many different analyses from different labs, they would all likely report a residue in this range. This uncertainty comes from various factors, including:

- Sample homogeneity
- Extraction efficiency
- Matrix effects
- Instrument variability
- Analyst and environmental factors

The uncertainty factor or range does not change the result, it merely indicates how confident the analytical service provider is that this is the true result (i.e. it defines the confidence range). A larger uncertainty range is expected at lower concentrations (or smaller amounts of the active substance detected). Important to note, due to this uncertainty factor that will always be built into results, multiple results obtained from the same sample will likely not be identical.

Comment (Paul Hardman): The market (retailers) is sensitive to the amounts of residues on fruit, even if below the MRL. Packhouses tend to adjust their residue loading to try and meet retailer demands like limiting the number of residues on fruit. This point illustrates that growers make decisions based on data from the lab results without necessarily understanding the uncertainty factor.

Follow-up question (Sarah le Grange): A lab report is potentially used by multiple parties, e.g. the grower, exporter, client/retailers and there are a number of terminologies used that may not be fully understood by everyone, like 'non-detected', 'limit of detection' and 'limit of quantification' – it is important that we make sense of what is communicated in the reports.

Citrus Growers' Association OF SOUTHERN AFRICA
Grower levies working for you!

P.O. Box 461
Hillcrest, 3650
Unit 7 – 22 on Main,
22 Old Main Road,
GILLITTS 3610
Kwa Zulu Natal, South Africa
Tel: +27 31 765 2514
Fax: +27 31 765 8029
Email: info@cga.co.za

Comment (H&K): This uncertainty factor is used to verify if the residue complies with MRL regulations. If the variation range is detracted from the result and the answer is still within the legal MRL, the sample is compliant. The actual uncertainty factor or range is usually much lower in reality when labs report results.

> *The European Guide SANTE /12682/2019 titled "Procedures for analytical quality control and method validation for the analysis of pesticide residues in food and feed" specifies that laboratories in the EU should report results with uncertainty factors to verify the compliance of the sample. To cover inter-laboratory variability between different labs, it's recommended that national authorities use a default "increased" measurement of uncertainty of 50%. The guide states that the results should be reported as follows:*
>
> *Results= X ± U, where X is the value and U the measurement uncertainty. In the context of official food controls by regulatory authorities, compliance with the EU MRL should be verified as follows: the sample is non-compliant if the X-U> the MRL.*
>
> *A default expanded Measurement Uncertainty of 50 % (corresponding to a 95 % confidence level and a coverage factor of 2) has been calculated from EU proficiency tests. In general, this 50 % value covers the inter-laboratory variability between the European laboratories and is recommended to be used by regulatory authorities in cases of enforcement decisions (MRL exceedances). A prerequisite for the use of the 50 % default expanded MU is that the laboratory must demonstrate that its own expanded MU is less than 50 %.*

Comment (Paul Hardman): The commercial reality is that retailers tend to (wrongfully) reject fruit even if the residue is below the legal MRL after applying the regulatory 50% uncertainty range.

Comment (Wayne Mommsen): This uncertainty range is quite big with the implication for potential MRL exceedances if the 50% range is applied. It does not seem accurate enough for what we need.

Question (Sarah le Grange): This 50% uncertainty sounds like a theoretical consideration when regulators interpret residue results to verify MRL compliance, but results from labs normally have a narrower uncertainty range.

3. **Question: Why will a residue result obtained from the same sample/batch never be exactly the same if analysed between two different labs? Please explain what a proficiency test is, how the labs perform these tests and what it means if you "pass" this test? Please explain the difference in local versus international proficiency tests if there are any**.

Answer (Microchem): Although not a simple answer, there are generally two parts to it. Results are expected to be statistically comparable, while they might not be identical. When participating in a proficiency test (or 'ringtest') the labs receive a homogenous sample (a pulp split into parts and given to different labs). It is more difficult to statistically compare results from two different samples from the same PUC/batch.

Participation in proficiency tests is a prerequisite of ISO 17025 accreditation. Labs will receive a homogenous pulp with unknown concentration of analytes, and the analysis is done as if it was a normal submission. The residue results are submitted to the proficiency body, and the performances are then statistically compared to reference values and the other laboratories taking part in the test. If a lab passes this test, it demonstrates competence – that the lab can accurately identify and quantify

Citrus Growers' Association OF SOUTHERN AFRICA
Grower levies working for you!

P.O. Box 461
Hillcrest, 3650
Unit 7 – 22 on Main,
22 Old Main Road,
GILLITTS 3610
Kwa Zulu Natal, South Africa
Tel: +27 31 765 2514
Fax: +27 31 765 8029
Email: info@cga.co.za

unknown analytes. This test offers protection against false confidence and assists with 'method-fit-for-purpose', verifies staff competence and checks if instrument calibrations and quality control measures are within specifications.

Generally, the international proficiency tests have more labs that participate and SA labs then benchmark themselves against these labs. The institutions performing the proficiency tests also need to carry an accreditation to make sure that the unknown sample prepared for all the participating labs meets certain criteria. A Z-score of ± 2 is usually the acceptable range. If a lab fails to report results within the Z-score it will trigger a root cause analysis to resolve the issue, e.g. it might be the extraction process or matrix effect that could be the root cause. *(One of the most widely used statistical methods to interpret the results of proficiency tests, is the **z-score**, a metric that helps identify significant deviations from the assigned reference value.)*

4. **Question: What is the difference between non-accredited and accredited active substance screening? And are the results valid if a non-accredited active substance is reported?**

   Answer (PPECB): An accredited result must comply with certain criteria:
   - Completed a method validation according to an international standard for example, SANTE or EUROCHEM guidelines.
   - Fulfil all requirements according to the ISO 17025 standard and certain South African National Accreditation System (SANAS) requirements.
   - Accuracy must be evaluated by means of a proficiency test (one challenge here is that a single blind sample might only be spiked with 10-12 unknown analytes and there are many more analytes the labs need to analyse). These analytes are typically the most frequently used on the specified matrix, for example the expected residues one would find in orange pulp.
   - Precision needs to be demonstrated through instrument repeatability and reproducibility performed by different analysts on different days to give confidence that different analysts will get comparable results.
   - The reporting limit or limit of quantification must be determined for the analyte: the lowest concentration the lab can determine at a 95% confidence level
   - The measurement uncertainty
   - The validation reports must be assessed and approved by SANAS

Non-accredited results may include partially completed validation studies or certain criteria or parameters that were not met, for example the measurement uncertainty is not reported. These actives can be included in the scope of analysis, but must be indicated on the certificate or residue report as such. (PPECB indicates these results with an asterisk* as an example). The same quality control principles are applied for these actives as for the accredited actives, like daily monitoring charts. It's not an ISO or SANAS requirement that measurement uncertainty must be reported with the results, but it should be available on request. Meaning, a PPECB inspector will look solely at the residue result that is reported to determine if a sample is compliant.

When clients or retailers ask about the "non-accredited" results in residue reports, please liaise with your service provider to assist with an explanation as to why the results are valid and may still be used.

Comment (Willem Immelman): The non-accredited results are checked by the Department of Agriculture, Directorate Food Safety and Quality Assurance by means of audits. Meaning, all results (both accredited and non-accredited) are assessed by external bodies.

Citrus Growers' Association OF SOUTHERN AFRICA
Grower levies working for you!

P.O. Box 461
Hillcrest, 3650
Unit 7 – 22 on Main,
22 Old Main Road,
GILLITTS 3610
Kwa Zulu Natal, South Africa
Tel: +27 31 765 2514
Fax: +27 31 765 8029
Email: info@cga.co.za

5. **Question: What does it take to broaden the pesticide testing scope of a lab? And what are examples of 'stand-alone' methods/analyses and does this require more effort to validate or set up in the labs?**

Answer (Hortec): Labs often get asked if they can 'quickly add' a new molecule to their testing scope, unfortunately, this process is not as straight forward and requires planning and investment. If the active can't be detected by means of a multiple residue analysis, it will require a single residue method which is often more complex. Certified reference standards need to be procured; a new method would have to be validated involving multiple extractions and analyses; and the availability of instrumentation and staff may be limited in peak seasons to perform this work (taking into account that the validation must be performed for each relevant commodity). The communication stream to the labs can improve; by the time the labs see a new molecule MRL published, they need to catch up with the analysis work which is particularly challenging for new/novel molecules not yet available as reference standards.

Citrus stakeholders are reminded to specifically indicate to the labs if they want a stand-alone analyses to be performed on their samples, for example, the dithiocarbamates (including mancozeb) will not be detected through a multiple residue analysis. Other examples of stand-alone reside analysis are for ethephon, phosphonic acid (fosetyl-aluminium), total 2,4-D and dichlorprop. If growers or packhouse managers are unsure about which methods to indicate on their request form, please talk to your analytical service provider.

Suggestion (Sarah le Grange): The Food Safety Forum with the Department of Agriculture, Directorate: Food Safety and Quality Assurance may be the appropriate platform where Directorate Inputs Control can share information on new molecules registered to all the ORLs. We should find a practical way to inform all ORLs in South Africa about what is registered in the country on which crop. Registration holders should have a list available of all the ORLs to inform them in time about a new active substance registration.

6. **Question:** How can sampling on farm level influence the residue result and please share an example (pre- and post-harvest). Any suggestions or small changes that can be implemented at packhouse/farm level that can make a difference?

Answer (Labserve): Sampling can skew residue results massively. For example, if a fruit that has been sprayed twice is picked or fruit on the edge of the tree canopy or orchard. Some labs have found variation in residue results from tree-to-tree inside a single orchard due to alternating tractor speed and movement at time of application. There is much less variation at the analytical stage where frequent quality control checks are in place (e.g., internal, external, and matrix QCs). Growers or packhouse managers need to submit a **representative sample** to the labs.

Suggestions to get a better average of residue load on fruit:

- Sample throughput an orchard on several trees
- Make sure the person sampling is well trained on how to obtain a representative sample
- Sample with clean hands (labs have encountered cross contamination from workers handling bait stations prior to sampling)
- Avoid sampling at a single point in the packhouse line
- Avoid sampling when the packhouse line is standing still
- Take applicator various inside orchards into account
- Avoid storing residue samples for analyses close to air freshener or insect killing sprayers
- Avoid cross contamination issues when packaging and shipping samples:
    - Don't mix different citrus types in one container

Citrus Growers' Association OF SOUTHERN AFRICA
Grower levies working for you!

P.O. Box 461
Hillcrest, 3650
Unit 7 – 22 on Main,
22 Old Main Road,
GILLITTS 3610
Kwa Zulu Natal, South Africa
Tel: +27 31 765 2514
Fax: +27 31 765 8029
Email: info@cga.co.za

  - Use clean sampling bags
  - Avoid using fruit nets
- Missing or incorrect information on the request form causes delays and could lead to incorrect analysis

Generally, labs will create a pulp of the representative sample to create a homogenous sub-sample.

Sometimes a specific analyte is not detected above the limit of quantification (LOQ) on the pre-harvest sample, but it appears on the postharvest sample from the same orchard. If this occurs, packhouse managers are encouraged to talk to their analytical service providers as the lab may be able to confirm if trace amounts of the active was detected (below LOQ which is generally slightly higher that the limit of detection).

Stakeholders were reminded that a mere detection of an analyte could mean that it was detected in parts per billion, comparable with 1 second in nearly 32 years of time. The equipment is extremely sensitive.

7. **Question: Do the labs calculate/report the ARfD of active substances, and if so, how is this calculated?**

Some labs report the % ARfD of active substances due to international clients seeking the formation. Some labs make use of a third party to perform the calculations.

Feedback from CGA: We've seen an increase in demand for the %ARfD calculations abroad, especially on the retailer side, but we recommend growers to follow the legal label instructions and not to base their dosage rate on ARfD calculations. We've been informed that not all calculators are equal or accurate. Safety margins within legal MRLs are a responsibility that should preferably be handled by independent scientific bodies, such as the European Food Safety Authority or Great Britian Health and Safety Executive when establishing legal MRLs (and not driven or interpreted by non-scientific bodies such as anti-pesticide NGOs).

8. **Question: What is the difference between 2,4-D free acids vs total 2,4-D residues and what should packhouses indicate when they request 2,4-D residue analysis especially for sensitive markets with a low 2,4-D MRL?**

Answer (Hortec): 2,4-D free acids can be detected by a multiple residue analysis, however, this will not give you the total concentration of 2,4-D present. (it will generally be 2-8 times lower than the total amount). The total 2,4-D analysis, known as the alkaline hydrolysis method, requires additional steps and is a standalone method to determine the salts, esters and conjugates of 2,4-D. Please note: when comparing 2,4-D results between different labs, make sure that the same analysis was carried out.

9. **Question: Apparently, formetanate is sometimes undetected? How can this be overcome?**

Answer: The stability of the compound is sometimes challenging for the labs, but overall, it's a fairly easy analyte to detect and quantify. There shouldn't be a problem.

10. **Question: Ethephon breaks down into ethylene. How can the analytical method and/or machinery distinguish between applied ethephon vs naturally occurring ethylene or applied ethylene in ripening rooms?**

Answer: Ethephon residues are analysed with a specific, stand-alone method. A very selective instrument is used to look for the parent compound's molecular mass. Ethylene residue analysis is generally performed on a different instrumentation is much more volatile compared to ethephon.

Potential action items:

Citrus Growers' Association
OF SOUTHERN AFRICA
Grower levies working for you!

P.O. Box 461
Hillcrest, 3650
Unit 7 – 22 on Main,
22 Old Main Road,
GILLITTS 3610
Kwa Zulu Natal, South Africa
Tel: +27 31 765 2514
Fax: +27 31 765 8029
Email: info@cga.co.za

- Orchard and packhouse sampling guideline from CGA/CRI
- Growers would like communication on trends from abroad that would require additional testing apart from the usual residues

Date of next meeting

5 June 2026. A *Save the Date* will be sent out beforehand.

Close

All participants and the guest speakers were thanked, and the meeting was closed.