Citrus Packhouse

Module 8:
Quality Management

Learner Guide

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

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Introduction

We have now looked at the complete packhouse process, from where fruit is received to the point where it has been packed in cartons and stacked on pallets. The last step, before the pallets can be loaded for transport, is inspection and approval for export by the PPECB.

But end-point inspections are only part of the quality management system in a packhouse. The essential components of the system also include accreditation, fruit intake assessments, and internal quality assurance systems. The final product inspections not only verify the suitability of the product for export, but also provide information about how well the quality management systems are performing. If the packhouse product consistently meets the quality requirements, the product quality management systems are functioning well.

The purpose of quality management in the packhouse is twofold. Firstly, it aims to ensure that fruit leaving the packhouse is safe for human consumption and will not expose any person handling or consuming it to undue food safety risks. Secondly, it aims to ensure that the final product leaving the packhouse complies with the regulated Standards and Requirements for export fruit, and with the Standards and Requirements of the target market and overseas client. In the module on sorting and grading we look at export standards and requirements. Please review this module to ensure you understand these concepts.

Packhouse Accreditation

Packhouses must maintain high food safety standards to ensure that their products will not cause harm to any person eating or handling them. SA GAP certification is the minimum food safety requirement for any packhouse to operate, including those that only pack for the local market. Export target markets and clients require packhouses to be certified by additional accreditation schemes.

The most common of these are GLOBALG.A.P., which applies to on-farm packhouses, BRC with HACCP as a requirement, and SIZA. It is also quite common to have additional food safety checks, as required by the specific buyers whom the packhouse supplies. Audits for accreditation schemes are done by external, independent certification bodies. More information about all these schemes is readily available.

GLOBALG.A.P. is a global organisation aimed at ensuring safe, sustainable agriculture by creating a set of standards for good agricultural practices. One of these models is the Produce Handling Assurance (or PHA) standard, which applies specifically to cooling, packing, re-packing, handling, and storage facilities. GLOBALG.A.P. also offers add-on certifications, such as GRASP, which is the GLOBALG.A.P. Risk Assessment on Social Practice. These add-ons are sometimes required by clients such as supermarket groups.

BRC certification is now required by most leading food retailers. The standard was developed by the British Retail Consortium, or BRC, and aims to assess the ability of food processing facilities, including packhouses, to comply with food safety standards and demonstrate due diligence. BRC audits focus on the processes and systems in the packhouses. The principal requirements of the BRC standard are the adaptation of HACCP, having a documented quality management system, and demonstrating control of factory environmental standards, products, processes and personnel.

HACCP stands for Hazard Analysis Critical Control Point. The primary goal of HACCP is to prevent problems from occurring by proactively identifying and pre-empting possible hazards. The seven principles of HACCP are hazard analysis, identifying critical control

points, establishing critical limits, monitoring procedures, taking corrective actions, verification procedures, and recordkeeping and documentation.

SIZA stands for the Sustainability Initiative of South Africa. SIZA is a non-profit company which was established by the fruit industry. It provides a Standard and system to measure and communicate the performance of the businesses on ethical and environmentally sustainable practices. Third party auditors verify this performance as part of the overall approach to provide stakeholders with the required assurance.

Accreditation systems may seem to be just another compliance requirement, but it can and should be used as an opportunity to improve the operational standards of the packhouse by benchmarking it against others, with audits as an objective assessment of current practices.

Occupational health and safety is an important component of accreditation systems, in addition to being a regulatory requirement as all packhouses have to comply with the Occupational Health and Safety Act. Packhouses are highly industrialised environments, with equipment, machinery, vehicles, and agrochemicals that can cause injury to workers and visitors. Measures aimed at limiting the probability of injury must be in place and enforced, and notices must be put up to create awareness about possible hazards.

Fruit Intake Assessment

A fruit intake assessment is done at receiving. When the packhouse starts tipping the first fruit from an orchard, a sample of the fruit is analysed to determine the average quality and size range. This information is used to make decisions about the packhouse process, such as how many sorting stations to use. If the fruit is of good quality with a high pack-out percentage, less sorting on the line is required.

In addition to this assessment of external quality, the quality control officer conducts tests to determine the internal quality of the fruit in the intake sample. In the module on sorting and grading during the discussion on internal quality factors, we describe in detail how these tests are conducted. This information is recorded and used to verify that the fruit meets minimum export Standards for internal quality.

The quality control officer also conducts a cull factor analysis, which can be done with the intake sample, but can also be done with a sample taken after the washing system, when it might be easier to identify marks on the fruit. For the cull factor analysis, the fruit deemed unfit for export is sorted according to the reason for being unfit. These reasons may include under- and oversize, colour, pest or disease damage, decay, and fruit injury, with special attention to picking injuries. Fruit with pest and disease damage is further separated per the type of damage. This information is recorded, and feedback is given to the production unit.

Internal Quality Assurance System

Every packhouse needs to implement a quality assurance system with components that ultimately guarantee overall product quality. In this sense, the packed and palletised fruit is the product, while quality refers to the quality of the fruit itself – whether it is safe, protected from postharvest diseases, and complies with market standards and requirements –, the quality and soundness of the packing material, and the quality of packing, palletisation and marking practices.

The perfect product looks as follows: The right number and quality fruit, packed using packing material that complies with packing material specifications, with the right number of cartons stacked neatly and squarely in the correct stacking pattern, on a sound pallet that complies with specifications, with strong corner pieces precisely on the corners and resting

on the pallet, strapped together with the right number of straps in the prescribed positions, with a pallet cap and securing sheets in place if required, and with labels on every carton stuck down squarely and neatly without any peeling corners. This is what a quality assurance system must aim to achieve with every single pallet that leaves the packhouse.

The principle of quality-at-source is fundamental to quality assurance. This is where every person who handles any part of the final product or controls any part of the process that impacts on product quality, takes responsibility for maintaining quality in that moment, prior to external control or supervision. This requires that every person in the packhouse must fully understand the impact that their actions can have on the final product.

Quality Supervision

Supervisors and section managers are principally responsible for quality assurance in their particular section of the packhouse process. It is up to them to monitor and correct the behaviour and actions of the workers in their sections, and to ensure that the quality assurance system is maintained. They are also responsible for doing spot-checks, such as on packing material, fruit quality, and stacked pallets.

Every packhouse also has quality control officers who are responsible for monitoring quality control points to ensure that processes are running within set parameters, thereby ensuring that product quality is being maintained throughout.

Quality Control Points

The number of quality control points differs from packhouse to packhouse, but as many of these points should be put in place as is necessary to assist with operations, and to give comfort that process and product quality is being monitored well enough to ensure consistently high performance of the packhouse.

One way of verifying that processes are running within set parameters is by taking fruit samples at various quality control points along the packline and checking that sorting and grading practices are accurate. This may include samples taken right after the main sorting stations from the main line and from the processing lines, as well as samples taken by the automated grading machine from any of the categories it is grading at the time. These samples are analysed by the quality control officer to determine whether the correct standards are being applied by the sorters and grading system. An approach that uses regular and random sampling patterns is encouraged to ensure the performance is being monitored thoroughly.

Other quality control points that are monitored closely are the settings for the de-greening chambers, and parameters such as pH, temperature, and the concentration of actives in the drench, washing system and fungicide treatment solutions. In some packhouses this is done by the quality control officers, but in some cases the packline manager has this responsibility.

An important quality control point is at the packing tables. Quality control officers regularly inspect packed cartons of fruit to assess whether they meet market standards and requirements, and whether the fruit inside the cartons corresponds with the label on the carton.

The final quality control point is after palletisation, when all stacked pallets should be checked to verify that they comply with the quality standards that the packhouse sets for its final product. Remember, never let a pallet leave the packhouse that you are not proud to claim as your own, and happy to call proudly South African.

Retention Samples

Best practice is for the packhouse to keep one carton from every consignment of fruit that is dispatched, until the consignment reaches its destination, and is accepted. This is called a retention sample. Retention samples are the last important component of quality assurance. They allow the packhouse to monitor fruit quality even after a consignment leaves the packhouse door. If the packhouse management detects quality issues with the retention samples, they can choose to divert the consignment in question to a different market.

Retention samples are kept in special rooms, which can be cooled or at ambient temperature, depending on the quality parameters for which the packhouse wants to monitor. The main purpose of retention samples is to verify reports and claims from the fruit importer. For instance, if there is a claim that the fruit in a consignment exceeds maximum residue levels, the fruit in the retention sample can be tested to verify whether this is the case. Likewise, if there is a claim that the fruit in the consignment does not meet the export standard, the retention sample can be assessed to verify the claim.

PPECB Inspections

The Perishable Products Export Control Board, or PPECB, is a public entity that is the mandated certification agency for perishable products intended for export. The PPECB delivers inspections and food safety services assigned to it by the Department of Agriculture, Land Reform and Rural Development, or DALRRD. The European Commission also recognises the South African inspections by the PPECB as equivalent to that of the European Union inspection bodies, which means that less frequent checks are performed at the port of import into the EU.

The PPECB provides two types of inspection services used by the citrus industry, namely quality inspection services at packhouses, and cold chain services.

The first purpose of packhouse quality inspections is to ensure compliance with Export Standards, and the quality and shelf-life of the fruit. The second purpose is to verify compliance with phytosanitary requirements. Note that the PPECB will only inspect against the regulated Export Standard, and not against any specific Standards set by a client or export agent.

At the start of season, the PPECB conducts a facility inspection, during which they verify that the packhouse and production unit is registered with DALRRD, that valid food safety certificates are in place, that registrations for special markets have been done where required, and that the packhouse facility is suitable for packing export citrus and has the required equipment for inspection. These facility requirements include sufficient space, reliable electricity supply and potable running water supply, sufficient light on the packhouse floor, sufficient inspection space and equipment, lockable cupboards, safe storage space for flammable material such as packing materials, and so on. Throughout the season, the packhouse must ensure that the PPECB inspection area and equipment are compliant with the requirements. A checklist, which also includes specific requirements for specific kinds of fruit, is used during this inspection.

Throughout the season every pallet of fruit that is packed in the packhouse must be inspected and passed for export by PPECB inspectors before it can be transported to the port. When the packhouse has a consignment ready for inspection, it sends a request to the local PPECB office. To ensure a quick response and avoid delays, the PPECB stations

inspectors in all citrus-growing areas throughout the season, and even places inspectors permanently at large packhouses.

In preparation for inspection, the inspector is given the consignment note for the fruit to be inspected so that the correct standards can be applied. The consignment note can be in hardcopy or an equivalent electronic file containing the same information. It is essential that the document or file contains all the relevant, correct information, and is readily available to the inspector. If the fruit is destined for a special export market, this will also be indicated. Pallets destined for special and normal markets should be in separate consignments.

Special markets refer to export markets that have specific quality, marking and inspection requirements. These special requirements are based on bilateral agreements with these countries, and form part of the regulated Export Standards. The requirements for special markets change from time to time, and it is important that packhouse management and the quality assurance team are familiar with any special requirements for their target markets. Special market requirements can be found on the DALLRD website.

For phytosanitary markets, fruit inspections also include checking for the presence of specific pest insects and disease symptoms, as per the requirements of the specific market.

For most markets, a standard inspection procedure is employed. A sample of 2% of the cartons on a pallet or consignment is taken. The boxes are marked carefully to ensure that they can be returned to the correct place, so that traceability is maintained. The carton is opened, and the fruit is examined by the inspector. The number of fruit that is examined from each carton depends on the target market. The evidence and outcome of the fruit inspection are captured electronically, or manually on finding sheets.

If a PPECB inspector is certified as competent for a kind of fruit, such as citrus, it means that they have been trained on the Export Standard for that kind of fruit for each export market. They undergo intensive theoretical and practical training, after which they work under the supervision of a senior inspector until they are competent to work alone. Inspectors always carry the Standards and Requirements with them as a reference while doing inspections.

The inspector also verifies that all the cartons on the pallet comply with marking requirements, especially for special markets. For this reason, it is important to make sure that the inspector has access to all sides of every pallet. Note that labels must never be stuck over one another, as superimposing of labels is not allowed in many markets and can lead to rejection of the consignment.

If the inspectors find that the fruit in the consignment complies with the relevant Standard that is applied, the consignment note is stamped, and each pallet is marked as approved for export. If pallets are loaded into a container at the packhouse, the PPECB inspector monitors the loading process, provided that they are a competent cold chain inspector as well. The inspector seals the container.

Maximum residue level, or MRL, samples are taken once at the start of packing for each production unit for each fruit type, after which samples are taken every three weeks. The PPECB inspector takes the samples for MRL testing during the inspection of the first consignment. The MRL analysis is conducted by a certified laboratory officially recognised by DALRRD. The sample is tested for all actives on the MRL list applicable to the specific target market. The results are received within four days, but the consignment from which the sample was taken can be despatched to the port in the meantime. The grower is informed of the outcome of the tests. In case of non-conformance, a follow-up sample is taken and analysed, and the frequency of sampling for that fruit type is increased.

The outcome of a quality inspection is valid for 28 days for oranges and grapefruit and for 21 days for soft citrus after the inspection is conducted. If the fruit is delayed in the port or cold store for longer than this, it must be re-inspected to verify that the fruit quality still complies

with the export standards. For this purpose, the PPECB stations inspectors at the fresh fruit terminal at the port, where they also conduct inspections from time to time along with DALRRD inspectors.

PPECB inspectors have the best interests of the South African fresh produce industry at heart. Their purpose is not to play policeman, but rather to provide a service to growers and packhouses and to support them in achieving the best possible returns from exporting fruit. They are always willing to help, to answer questions, and to assist with ensuring that standards are met.

Conclusion

Quality is a result of a process. To achieve the required quality, whether in fruit selection, how fruit is packed, quality of packing material, quality of palletising, or quality of logistics and handling, there is a process made up of many steps and stages, each one dependent on a person or a team following a proper process, complying to a standard operating procedure, and making good decisions. The better the process and the better the team, the more assured you are of a quality outcome. It is vital that you think in terms of a quality management and assurance system, and not just control.

Think honestly about the following important questions:

- Are your quality assurance process and outcomes well-defined and communicated?
- Does every person in the packhouse understand their contribution to quality?
- Do you accurately measure and track quality performance?
- Do you experience recurring quality problems? If so, look at your process and your practices, identify root causes and implement a permanent solution.
- Are you relying too much on final inspections, or inspections by an external party to manage quality? If so, have a good look at how well your quality control and assurance system is embedded in your teams.
- Are you assuring a quality product to the client by working closely with your upstream suppliers, including growers, equipment and machinery suppliers and materials suppliers, and downstream service providers, such as logistics, port services and cold stores?
- How close are you to zero defects?