GRAIN TRADE AUSTRALIA

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Member Update

Title: **Australian Grain Industry Code of Practice – Call for Second Round of Submissions**

Update No.: **05 of 13**

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Distribution

- GTA Members – primary contact list. Please circulate to all appropriate internal parties

1. Issue

GTA is seeking industry comment in relation to the second public draft of the new *Australian Grain Industry – Code of Practice.*

2. Background

Following evolving market conditions and the industry's desire to demonstrate self regulation, GTA Members and the broader grain industry recognise that the development of a more prescriptive Code of Practice which better defines processes and procedures will negate the need for government imposed regulation.

For this reason GTA has developed a new Code of Practice known as the "Australian Grain Industry - Code of Practice (the Code).

The Code is intended to cover all Australian Grain industry participants throughout all stages of the supply chain.

The Code has been designed to promote the use of best management practice by all industry participants.

The Code is intended to detail/reference:

- mandatory requirement of all GTA members by FY14;
- alignment to the GTA Constitution;
- outline a complaints mechanism;
- seek Government endorsement.

The Code will reference many of the existing industry best practices documents, including a combination of quality assurance systems, storage and transport practices and sampling and testing regimes to assist the commercial marketing of grain in compliance with commercial and regulatory requirements.

It is intended that the Code will continue to be developed and reviewed over time, building on:

- additional Technical Guidance Documents;
- generic forms outlining data to be collected for various activities.

3. Industry Feedback

GTA Members are encouraged to review the Code and forward comments by way of submissions to GTA for consideration no later than **COB Friday 12 April 2013.** Submissions to be titled **Code of Practice Submission** and emailed to admin@graintrade.org.au

MANAGEMENT OF GRAIN

WITHIN THE

AUSTRALIAN GRAIN SUPPLY CHAIN:

Australian Grain Industry - Code of Practice

DRAFT V13

First Edition Published March 2013

Compiled on behalf of the Australian Grain Industry by:

Grain Trade Australia

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1. About this Code of Practice

1.1 Purpose of the Code

The purpose of this Code of Practice (Code) is to describe practices that the grain industry use to ensure Australian grain and grain products marketed meet domestic or export customer requirements. Customer requirements include those stipulated in contracts and regulatory requirements at the Australian State, Territory and Federal levels and international and overseas country level. There are also a range of industry standards that are covered under this Code.

The processes employed by industry at each point along the grain supply chain vary depending on the outcome required. Each industry participant manages their own operations based on the needs of their customers and their own internal procedures and systems.

The Code focuses on those common standards, operating procedures and documented processes. The Code assumes that all participants in the grain supply chain have in place established practices that ensure compliance with this Code.

By following this Code, the grains industry, including all sectors related to the grains industry, governments, researchers and consumers will gain confidence that processes exist in Australia to successfully produce, store and supply grain that meets the expectations of the entire grain supply chain.

The grain industry is committed to self-regulation. This Code assists that purpose by providing a process that is transparent and which outlines minimum requirements of all involved in the Australian grain supply chain.

This Code has been developed in line with the Australian Grain Industry Code of Conduct[1] developed in 2009 and subsequently revised in 2010. That Code of Conduct was developed by Grain Trade Australia (GTA) on behalf of industry with the financial support of the Australian Government Department of Agriculture, Fisheries and Forestry (DAFF) as part of the wheat marketing transitional funding assistance measures for the new wheat export marketing arrangements that commenced on 1 July 2008.

While GTA has agreed to be the custodian of the Code of Conduct, on behalf of the industry the new Code of Practice has been developed to provide further guidance to industry and confidence to customers that the grain industry is committed to meeting its obligations of providing grain according to Best Management Practice and according to regulatory requirements.

GTA will review this Code with input from industry, to ensure the integrity of the Code is maintained.

[1] Australian Grain Industry Code of Conduct Second Edition July 2010 – http://www.graintrade.org.au/publications

1.2 Scope of this Code

This Code is intended to cover all participants of the Australian grain industry. It has been developed to be applicable to all grain and grain products and applies to all stages along the supply chain. The Code has been designed to promote the use of best management practice by industry participants. It is the intention of GTA to seek Australian Government endorsement of the Code.

The Code outlines a number of key elements that are common to all industry sectors, apply to particular sectors of the industry or elements that relate to specific commodities only.

Industry recognises the value of formal Quality Assurance systems. While some sectors of the industry have implemented formal Quality Systems, their widespread adoption has not occurred. Implementation of this Code may assist adoption of Quality Assurance systems at all stages of the supply chain.

Industry uses a range of practices including a combination of quality assurance systems, storage and transport practices and sampling and testing regimes to assist the commercial marketing of grain in compliance with commercial and regulatory requirements.

1.3 Industry Endorsement

This Code applies to all participants in the supply chain from plant breeding through to the end consumer, and applies to grain and grain products marketed on the Australian domestic and export markets.

All organisations involved in the Australian grains industry are encouraged to adopt this Code. All GTA members support this Code. A list of GTA members that endorse the Code and commit to promoting the Code to their members is published on the Grain Trade Australia website at www.graintrade.org.au

Those industry participants who abide by this Code of Practice agree to:

- Comply with all laws and regulations relating to the growing, merchandising, inspection, grading, weighing, storing, handling and transport of grain, including relevant Occupational Health and Safety regulations;
- Conduct activities considering the impact on the environment;
- Comply with legal requirements for the application and use of chemicals at all stages along the supply chain;
- Comply with Australian and importing countries maximum residue limits (MRLs) and other regulated import requirements;
- Implement financial management standards where applicable;
- Comply with industry standards, processes and procedures where contractual obligations dictate;
- Comply with industry and individual company procedures where contractors are used;

- Maintain and promote the use of best management practice, standards and procedures in the transaction of business;
- Promote the adoption of safe practices at all stages along the supply chain; and
- Improve the standards of practice and service in the Australian grain industry.

1.4 Technical Guideline Documents

As this Code is further developed and reviewed over time, GTA will develop the following:

- Additional Technical Guideline Documents (see Appendix 2) providing more detailed information to industry on specific activities required to be conducted. These documents will assist implementation of each listed activity as outlined in this Code; and
- Generic forms outlining data to be collected for various activities, to support those Technical Guideline Documents.

Industry is encouraged to provide input into topics for inclusion and development of Technical Guideline Documents.

2. Code of Practice Requirements

This Code lists a number of activities that industry will undertake along the supply chain. Activities are listed based on the main supply chain locations where grain is managed. There is no intention to prioritise each activity, as all are considered essential to managing grain within the Australian grain industry.

There are a number of generic processes that occur along the supply chain that are applicable to more than one of these activities. For example:

- Compliance with applicable regulations
- Staff training
- Documentation of procedures
- Collection of data and maintenance of records
- Traceability through the supply chain

2.1 On-Farm Activities

2.1.1 General Processes

This activity refers to all processes occurring on the farm including:

- Pre-sowing
- Growing of the crop
- Harvesting
- Storage
- Transport

Best management practices are implemented over a range of activities to manage yield, grain quality, agronomic aspects of the crop and environmental impacts, and to limit and/or eliminate the presence of toxins, microbial and other contamination, non-approved chemical residues and Stored Grain Insects.

Activities conducted in all areas of operations for this purpose include:

- Maintaining the hygiene of storages, equipment and surrounds
- Minimising contamination of the commodity produced
- Following regulatory requirements and controls at all times
- Where contractors are used to carry out an activity, a declaration is provided by the contractor attesting to compliance with industry guidelines

Documentation and records of relevant management practices are kept. Records are kept as per requirements of any relevant Federal, State or Territory legislation or as required by industry. For the purposes of traceability of Variety to verify Declarations this includes identifying:

- The source of seed
- Seed retention
- Paddock utilisation
- Storage utilisation

2.1.2 Crop Growth

Where applicable, seed purchased for sowing complies with the Australian Seeds Federation National Code of Practice for Seed Labelling and Marketing.[2]

Seed is:

- Labelled;
- Accompanied by an assurance that the variety has been tested; and
- Treated prior to sowing to minimise potential disease infestation during crop growth.

During crop growth a range of agronomic practices are conducted:

- To maximise the quality of grain produced;
- To maintain the integrity of the crop;
- To minimise contamination of the harvested grain;
- To control pests and diseases as required; and
- Records are maintained of all treatments applied.

Principles of managing pests are followed, as outlined in the Farm Biosecurity Manual for the Grains Industry[3]. This includes at a minimum:

- Crop monitoring and pest surveillance;
- Maintaining good farm hygiene;
- Keeping records; and
- Reporting suspect pests.

[2] Australian Seeds Federation National Code of Practice for Seed Labelling and Marketing – http://www.asf.asn.au/content.php?id=39

[3] Farm Biosecurity Manual for the Grains Industry "Reducing the risk of exotic and damaging pests becoming established on your farm" – http://www.farmbiosecurity.com.au/toolkit/farm-biosecurity-plansmanuals/

2.1.3 Grain Harvesting and Storage

Grain is harvested, handled and stored to preserve its integrity according to industry standards. Where relevant, on-farm storage facilities are managed as per requirements outlined in Section 2.3 "Storage Facilities".

During the storage period:

- Documentation and records of all storages used on-farm are kept by the producer;
- All storages are maintained in a suitable condition;
- Grain is monitored to preserve its quality;
- Documentation is kept of grain storage and handling to provide traceability through to the next segment of the supply chain; and
- Stored grain is managed to comply with the need to be free of live stored grain insects on outturn.

All chemical treatments to storages, handling equipment and grain are applied as per regulatory and industry requirements.

2.1.4 Movement ex-farm

Prior to loading, all transport is inspected to determine its suitability for loading and transporting grain. Best management practices for the transport industry as outlined under section 2.6, are followed where relevant.

For the purposes of traceability, producers provide appropriate documentation to transport agents when used to move grain from the farm through the supply chain. Grain is accompanied by declarations that provide details on the status of the grain as required by the market place.

At a minimum a declaration is required:

- For the tonnage of grain covered under each individual contract; and
- For each truckload tendered for delivery where no contract exists (e.g., at harvest)

The declaration must include:

- Variety;
- Chemical treatment and residue status; and
- GM status

2.2 Sampling and Testing Grain

Documented procedures for equipment use and sampling and testing procedures are outlined in the company Sampling Manual or the Operating Procedures.

2.2.1 Equipment to be Used

There is a range of equipment available for sampling and assessing the quality of grain against specifications listed in standards. The type of equipment used, the level of sophistication and accuracy will vary by organisation, location used, purpose of use and commodity being assessed.

Only equipment suited to its intended purpose is to be used. The preference is for the use of:

- Automated versus manual probes;
- A grain divider to obtain a sub-sample for assessment;
- Objective technology unless specified in the Contract and/or Storage and Handling Agreement; and
- Reference material where available.

2.2.2 Equipment Monitoring and Calibration

Equipment is to be routinely monitored, calibrated and checked to ensure correct operation as outlined in the company Sampling Manual or the Operating Procedures. The frequency of calibration and these checks will vary based on the type of equipment, frequency of use and operating procedures of the company.

Checking of the calibration will be done by a person appropriately qualified to carry out such a task. Personnel may be external to the company or internal staff skilled in that task.

If equipment is found to not be properly calibrated, the Sampling Manual or Operating Procedures is to be checked for actions to be taken.

2.2.3 Trade Certification of Equipment

Equipment used may be deemed "for trade", thus it must meet certain regulatory conditions[4].

Industry is committed to the use of all equipment of a standard for "use in trade" where the outcome of the grain classification process is a payment to the supplier of the grain. All other testing equipment that does not fall under this legislation is also to be checked under similar processes, as it is the desire of industry to adopt world's best practice in grain testing.

GTA committees communicate as required with the relevant State Departments of Fair Trading and the National Measurement Institute to assist industry in alignment of its standards and processes with State and Federal legislation and/or codes.

[4] National Measurement Institute - http://www.measurement.gov.au/Pages/default.aspx

2.3 Storage Facilities

2.3.1 Storage Construction & Maintenance

Grain storage facilities:

- Are to be soundly constructed;

- Must be maintained in order to prevent the entry of pests, vermin and moisture;
- Must prevent seepage of grain from the storage; and
- Are to be located in an area and the surrounds of suitable construction material to minimise contamination of grain and to prevent damage to stored grain through water ingress.

Where an individual storage is categorised as sealed and when used on that basis it is to comply with the Australian Standard AS2628[5]. This includes the requirement to comply with the pressure test as outlined in that Standard.

Storages should be suitable for the commodity to be stored. Preference is for the use of sealed and well maintained permanent storages for high value commodities. Aeration is a useful management tool for maintaining the quality of grain in storage.

The structural integrity of storages is monitored regularly during the storage period to maintain the integrity of the stored grain and to assist in maintaining its quality. Any storage condition that may impact on the quality of grain to be stored should be addressed as soon as possible following detection.

2.3.2 Grain Pest & Hygiene Management

A pest management strategy for all pests should be documented and regularly updated. Where required, additional pest management strategies should be implemented based on seasonal conditions (e.g., mouse plagues).

Industry follows the principles of Integrated Pest Management including where relevant using tools such as:

- Hygiene;
- Inspection; and
- Aeration.

Storages, their surrounds and all associated handling equipment should be regularly checked to prevent the entry of and to be practically free of pests, vermin and weeds. Where practical, the intention is that grain is to be maintained in an insect free condition.

[5] Australian Standard AS2628 Sealed grain-storage silos — Sealing requirements for insect control - http://infostore.saiglobal.com/store/default.aspx

Grain should be sampled regularly to determine the presence of stored grain insects:

- Any insect infestations should be treated as soon as possible following detection;
- Any chemical use should be done to follow industry guidelines, meet regulatory requirements and customer specifications;

- All chemical treatments to grain should be done to ensure compliance with all MRLs; and
- Only legal treatments for grain, storages, structures and surrounds are to be used.

Grain spillages and dust should be cleaned and removed from the site as soon as practical following grain movement. Facilities should be regularly cleaned down following outloading or movement of grain to remove carryover contaminants, assist insect control and assist maintaining hygiene.

2.3.3 Storage Operations

Any provider of a storage facility will operate that facility to ensure any commodity moving through that facility is not compromised in any way. This includes the use of a structural treatment for insect control.

All commercial Storage and Handling operators should provide a Storage and Handling Agreement outlining all terms and conditions.

As part of a Quality System, procedures will be documented for the major activities occurring at that facility.

All staff will be adequately trained and a documented Occupational Health and Safety procedure will exist as required by relevant legislation.

Services offered at the storage facility will be documented and where relevant, documentation will be publicly available that lists the range of commercial services including but not limited to:

- Storage and Handling Agreement outlining:
    - The nature of the service provided;
    - The responsibility of the storage provider in supplying the service to its customers;
    - Communication to the owner of the grain if an event has damaged the grain or prevents the owner from outturning or accessing the grain;
    - The liability of the storage provider should grain be lost or damaged;
    - Obligations of the storage provider covering insurance; and
    - The price for conducting those services.

- Notices of the requirement for industry to be compliant with relevant procedures and actions to be taken by the storage provider in circumstances where non-compliance is detected, such as:
    - Detection of pickled grain;
    - Detection of chemical residues in excess of legal requirements; and
    - Incorrectly completed CVDs.

As outlined in the Storage and Handling Agreement, trace back to the grain supply source will occur for investigation of all such non-compliances.

2.4 Chemical Use

2.4.1 Regulations

Industry is committed to complying with relevant Australian and International chemical regulations. The grain industry provides a product that is considered safe for human and animal consumption.

A whole-of-chain approach applies to food safety and chemical residue management and the provision of grain according to customer requirements through a combination of:

- Australian State, Territory and Federal Government legislation; and
- Industry approved quality assurance systems underlying the legislation.

At all times, the grain industry complies with all regulatory controls for chemicals. The key elements to the regulatory system are:

- Chemicals are registered for both pre-harvest and post-harvest use on grain. In Australia there are two Government bodies (Australian Pesticides and Veterinary Medicines Authority (APVMA) and Food Standards Australia New Zealand (FSANZ)) responsible for registration of chemicals and for determining MRLs of chemicals[6,7];
- Australia is a full signatory to the Codex Alimentarius Commission[8], an international body created by the World Health Organisation and the Food and Agriculture Organization to develop amongst other things International MRLs. The Australian MRLs, the registration and use of chemicals, are binding in all Australian States;

[6] The Australian MRL database - www.apvma.gov.au/residues/mrl.shtml The Food Standards Australia New Zealand (FSANZ) database - www.foodstandards.gov.au
[7] Maximum Residue Limits of agricultural and veterinary chemicals and associated substances in food commodities – http://www.apvma.gov.au/residues/standard.php
[8] Codex Alimentarius Commission - http://www.codexalimentarius.org/

- The Australian Government Department of Agriculture, Fisheries and Forestry (DAFF) controls exports under the Export Control Act 1982[9]. Plant Export Operations[10] is part of DAFF and is responsible for this task. Plant Export Operations interfaces with the grain industry through various means such as the Grain and Plant Products Export Industry Consultative Committee [11]; and
- The Australian National Residue Survey (NRS)[12] gathers information on chemical residues and environmental contaminants in the products of participating industries such as grain. Samples are taken from a range of

domestic grain products, container exports and all bulk exports of prescribed grains and assessed for levels of a range of chemical compounds. Where MRL violations are detected, the NRS initiates a trace-back system to determine the cause. That traceback system is done by the relevant regulatory authority in each State as required by legislation. As required by legislation, NRS reports on those violations.

- All grain organisations outturning on the domestic market to an end-processor (who is not defined as a primary producer) are required to participate in the NRS grains residue monitoring program;
- All bulk grain exporters are required to participate in the NRS; and
- All container exporters are required to participate in the NRS.

As required by legislation:

- Industry will not trade in grain that contains a chemical in violation of relevant legislation; and
- If any violation of an MRL or mis-use of a chemical is identified, it is to be reported to the relevant authority.

2.4.2 Industry Practices

Industry implements a range of quality assurance systems and practices relating to the safety and compliance of Australian grain with market and regulatory requirements, including insect control and chemical residues of pre and post-harvest chemicals. These measures:

- Incorporate the principles of Integrated Pest Management;
- Incorporate rotating the use of chemicals and judiciously using chemicals to manage resistance, to assist in ensuring chemicals are available in the long term;
- Include compliance with FSANZ "Draft voluntary Code of Practice to reduce national security-related risks in the chemicals supply chain"[13];

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[9] Export Control (Plants and Plant Products) Orders 2005 - http://www.comlaw.gov.au/Series/C2004A02606
[10] Exporting grain from Australia - http://www.daff.gov.au/aqis/export
[11] Grain and Plant Products Export Industry Consultative Committee - http://www.daff.gov.au/aqis/about/clients/consultative-committees/gicc
[12] National Residue Survey - www.daff.gov.au/nrs
[13] Draft National Code of Practice for Chemicals of Security Concern http://www.chemicalsecurity.gov.au/Pages/default.aspx

- Apply across the Australian grain supply chain from on-farm production to export in bulk vessels, containers or bags and trade to the domestic market; and
- Are updated based on a range of factors such as changes in regulations, variable agronomic practices and environmental conditions or the pest status of stored grain.

Chemical Application

At all times, chemicals are applied:

- Based on best management practice;
- To comply with labels for those chemicals;
- To comply with MRLs for those chemicals; and
- By appropriately qualified personnel.

Prior to and during crop growth, chemicals are applied:

- Based on agronomic and environmental conditions.

During and following harvest, chemicals such as structural treatments and stored grain treatments are applied:

- At rates based on a range of factors including end-use of that grain;
- To maintain and prolong the life of those chemicals;
- To comply with MRLs for each market;
- To comply with the Phosphine Resistance Management Strategy to prolong the life of phosphine[14]; and
- Abiding on outcomes, recommendations and activities of the National Working Party on Grain Protection[15].

Industry adopts a nil tolerance for live stored grain insects on outturn to the domestic or export market. Storages are actively monitored for the presence of live stored grain insects and industry strives for grain in storage to be free of live insects.

Fumigations are monitored to ensure recommended concentrations are achieved.

Commodity Vendor Declarations

Preference is for a single Commodity Vendor Declaration (CVD) [16] to be used across industry where possible. It is recognised CVDs may be developed by individual industry participants.

[14] Phosphine Resistance Management Strategy - http://www.crcplantbiosecurity.com.au/content/strategy-manage-phosphine-resistance or http://www.graintrade.org.au/chemical_tolerances
[15] National Working Party on Grain Protection - http://www.graintrade.org.au/nwpgp
[16] Commodity Vendor Declaration forms - http://www.graintrade.org.au/contracts

CVD forms:

- Are routinely used in the grain supply chain on receipt of grain from a producer or during the transfer of ownership within the trade;
- Must include details such as chemical residue status, variety and GM status of the grain;
- May include details of the quality status of the grain;

- Contain information that is used by the buyer or handler of the grain to confirm the status of the grain and to verify the grain meets regulations and/or market requirements; and
- Are only to be provided where information documented can be supported by records or other suitable means.

Quality Checks

Quality control checks:

- Are carried out from the time grain is harvested and received into storage up to the time it is placed on a shipping belt for loading onto a vessel for export, into a container for export, or as it is delivered to a domestic end-user; and
- Involve assessment of a range of samples taken along the supply chain to ensure customer and regulatory requirements will be met on outturn of that grain.

Samples and certification documentation may accompany each grain parcel as it moves through the supply chain, provided by each participant in the supply chain or by independent third parties.

Market Requirements

All involved in the grain supply chain, including producers, storage providers and marketers are to be aware of the relevant domestic and international MRLs applying to grain. These are outlined in the Australian Grains Industry Post Harvest Chemical Usage Recommendations and Outturn Tolerances publication[17] and on the NRS website[12].

Grain is only outturned:

- Following compliance with the legislated label requirements such as With-holding and Ventilation Period; and/or
- Analysis of grain to confirm residue levels.

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[17] Australian Grains Industry Post Harvest Chemical Usage Recommendations and Outturn Tolerances 2012/13 - http://www.graintrade.org.au/chemical_tolerances

Where grain is known to contain a chemical that is in violation of a regulatory or market requirement, industry will not supply that grain to that market unless:

- A mitigation strategy is implemented; and / or
- The supplier receives written agreement from the customer of the grain, provided regulatory requirements are not violated.

Traceability

All involved in the supply chain are responsible for providing traceability of grain through the supply chain. This is based on the principle that any entity in the supply chain has capability to trace grain one step forward and one step backward. Documentation is used to implement investigations on non-conformance.

2.5 Grain Quality Management

Industry complies with various competency standards that exist for the receival and management of grain[18].

All involved in the supply chain are responsible for providing traceability of grain through the supply chain. This is based on the principle that any entity in the supply chain has capability to trace grain one step forward and one step backward. Documentation is used to implement investigations on non-conformance.

2.5.1 Grain Receival

Industry preference is for the use of industry standards to classify grain. On receival of grain, the storage provider:

- Applies industry best management practice;
- Applies industry sampling and testing protocols;
- Documents operational procedures associated with sampling, testing and classification of grain and where possible, makes these publically available;
- Classifies grain according to industry or end-buyer standards[19];
- Conducts assessment and classification at the point of receival, recognising the practical difficulties of this process in certain situations;
- Assesses individual loads of all grain tendered for delivery according to those standards;
- Where feasible, uses reference methods for assessment;
- Documents and makes known to industry where variations to industry standards occur;

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[18] Various Competency Standards for Receival, Testing and Storage of grain - http://www.graintrade.org.au/CompetencyStandards

[19] Various Commodity Standards for the applicable season - http://www.graintrade.org.au/commodity_standards

- Uses reference material where available (e.g., GTA Visual Reference Guides[19]);
- Makes available at each receival site a documented dispute and rejection procedure for each load tendered for delivery. Preference is for the use of a common industry procedure;
- Obtains a declaration from the deliverer of the grain on a range of parameters, including where applicable commercial contract/price issues, variety, GM composition, chemical use and QA status of the grain;

- Takes various samples for further analysis of grain quality or verification of the declaration at receival based on the risk assessment procedure of the storage provider. At a minimum grade running samples are collected;
- Maintains relevant records of each delivery; and
- Check documentation of each delivery prior to unloading to ensure the integrity of the grain in storage will be maintained.

Segregations are created according to market requirements and based on the industry standard for that commodity and grade. Grain of differing grade classification is not blended unless:

- Procedures are documented;
- The outcome is known; and
- Appropriate approval has been obtained.

2.5.2 Grain Quality Management during Storage

During the storage period:

- Segregations and grain integrity are maintained to meet market requirements;
- Regular sampling and grain inspection occurs, and these processes are documented;
- Hygiene of the grain is maintained;
- Insect and pest control programs are implemented to assist in maintaining the hygiene of the stored commodity and meet marketing requirements on outturn;
- Following grain movement, grain spillages are to be cleaned on a regular basis; and
- Relevant records are maintained for all storages and when grain is moved within the storage facility. These records may include:
    - Commodity
    - Grade
    - Quality
    - Chemical treatments

2.5.3 Grain Outturn – Domestic

All handling and transport equipment is inspected prior to moving grain to ensure:

- It is of an adequate standard; and
- It will not compromise the integrity or quality of the grain.

During outturn:

- Samples are taken and grain is physically inspected to ensure its quality has been maintained in storage;

- Samples obtained are retained for a suitable period. A documented sampling, testing and sample retention procedure ensures all staff are aware of requirements;
- Transport units to be loaded with grain are to comply with relevant weight limits;
- Where grain weight is assessed, it is determined on a Registered Weighbridge; and
- Suitable documentation is supplied with the outturned grain to identify its quality and integrity.

2.5.4 Grain Outturn – Export

All export premises, pathways and processes must meet any regulatory requirements, including those stipulated by Plant Export Operations.

Documented procedures are to be maintained at the export premises relating to a range of procedures including storage and grain pathway hygiene, grain sampling, grain testing and sample retention.

Grain loading may commence:

- Once the empty vessel (e.g., bulk vessel, container or bag) is deemed fit to load, as per Plant Export Operations and Australian Maritime Safety Authority regulations and requirements;
- If grain pathways and the empty vessel have been inspected and it is determined they do not to contain any material that may adversely impact on the quality of the grain to be loaded; and
- Once the quality of grain accumulated is known. No grain is to be loaded unless the quality is known.

During loading:

- Grain is inspected as per Plant Export Operations requirements;
- Grain is sampled and tested for quality;
- Analytical results obtained using objective testing technology take precedence over results obtained by subjective assessment methods; and
- Independent Inspection companies are used where contractually required to independently verify the quality of grain loaded.

Following loading, samples are to be obtained representing the grain loaded. These may be assessed or retained as required.

2.6 Transport

For every grain movement, transport providers comply with transport industry best management practices to:

- Maintain the quality and integrity of the grain;

- Prevent unintentional contamination of the load; and
- Transport grain to their designated markets quickly, safely and within the relevant laws.

This is achieved through compliance with the Grain Transport Code of Practice jointly developed between GTA and the Livestock and Bulk Carriers Association (LBCA)[20] or other industry approved Transport Codes of Practice.

2.6.1 Regulations

All transport providers including staff and contractors involved in the transport of grain comply with:

- Regulations relating to all activities associated with transport vehicles such as
  - Loading and unloading
  - Consigning
  - Scheduling
  - Driving
  - Vehicle mass
- Relevant Chain of Responsibility legislation;
- Fatigue Management requirements;
- Relevant Biosecurity requirements; and
- Relevant industry Codes, including any industry approved Transport Code of Practice.

All transport providers are to have the relevant permits and be appropriately trained.

2.6.2 Processes

All transport providers:

- Must have suitably documented systems, procedures, facilities and training for all staff and contractors to meet the legislative and industry requirements for the transport of grain;
- Must be able to demonstrate adherence to the relevant Transport Code of Practice through records and audits, and must provide those records on request;

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[20] Various freight contracts http://www.graintrade.org.au/contracts

- Where there is a risk of contamination of subsequent loads, industry preference is for the use of dedicated transport units;
- When required, are to sample grain during loading or unloading to minimise the loading or discharge of inappropriate quality grain;
- Must ensure grain is loaded into transport units safely and within legal weight limits, using a Registered Weighbridge; and

- Are not to use non-compliant practices. This includes the end recipients of transport providers.

Where non-compliance has been detected:

- Actions must be taken to remedy the situation as soon as possible; and
- Where required, such incidents must be reported to the relevant authority.

All transport units (e.g., rail wagons, road trucks, containers):

- Are to be inspected and cleaned to an agreed industry standard in a suitable biosecurity area prior to loading;
- Are to be of suitable condition to maintain the integrity and quality of the product to be loaded (e.g., able to be enclosed);
- Are to be suitably dry and free of contaminants to preserve the quality of the grain to be loaded (e.g., free of fertiliser);
- Must comply with any industry or regulatory "prior load" requirements;
- Must be accompanied by relevant documentation and not be loaded unless the required documentation is provided;
- Are not to contain chemical residues that may impact on the integrity of the grain to be loaded or violate market or regulatory requirements;
- Must only be loaded with grain meeting legal weight limits;
- Are not to be used to fumigate grain while in-transit unless legally permitted to do so; and
- Are to be cleaned in a suitable biosecurity area following discharge.

2.7 Marketing

The Australian grain industry:

- Proactively identifies, engages in and maintains access to domestic and international markets;
- Strives to adopt common documentation and data management processes to assist these aims;
- Supports the use of documented contractual terms to facilitate aspects of the grain trade outlined within this Code, including where appropriate the use of the Commercial Resources developed by GTA[21] covering grain sales contracts, storage and freight agreements and grain standards; and

[21] Various contracts and documents http://www.graintrade.org.au/contracts

- Implements appropriate procedures for the management of grain quality to:
    - Underpin the product standard; and
    - To comply with food safety requirements.

2.7.1 Marketing Australian Grain

When marketing Australian grain:

- Industry participants do so with the intention of promoting and maintaining the reputation of Australian grain;
- Where applicable, the relevant grain standard and description as applied by industry will be used. This includes where relevant any varietal classification rules as outlined in the Varietal Master List;
- Preference is for the use of industry contracts and published grade standards;
- All grain traded is to be supplied with appropriate documentation;
- Buyers communicate relevant grain standards and specifications to their suppliers in clear, meaningful and accurate terms;
- GTA grade standards (e.g., referring to CS number) will only be used where the final grain out-turned meets all specifications of that standard including objective quality parameters, relevant Varietal Master Lists, varietal purity, and all rules associated with those grades are complied with, including:
    - Applicable dates for implementation of new seasons standards
    - Re-classification of old seasons grain
    - Blending of old and new seasons grain
- Where samples or analytical results are required to be provided as per contract terms, the marketer or supplier of the grain arranges these to be taken and assessed as per industry sampling and testing protocols;
- Certification is only to be supplied based on appropriate information such as records; and
- Provision of analytical results is only to be supplied based on appropriate sampling and testing or as outlined in the relevant contract or according to national or international standards.

For grain destined for the domestic market, grain meets all relevant Australian regulations such as:

- The Food Standards Australia New Zealand Food Standards Code;
- APVMA MRLs; and
- Where supplied for stockfeed use, all State and Territory stock food regulations.

For grain exported, the grain complies at all times with:

- Quarantine requirements of the importing country[22]; and

[22] Quarantine requirements of Importing Countries, MICoR http://www.daff.gov.au/micor/plants

- Relevant international standards such as:
    - Codex Alimentarius Commission
    - The Cartagena Protocol on Biosafety[23]

2.7.2 Market Access

Industry will cooperate with the Australian Government and industry organisations to:

- Maintain access to existing markets;
- Improve market access where applicable;
- Develop new markets for grain domestically and internationally; and
- Meet all of the requirements of its markets.

Each industry stakeholder recognises its responsibility to maintain the reputation of Australian grain. Through its actions, each stakeholder will adopt policies and processes to ensure that future trade to markets is enhanced.

2.7.3 Contract Documentation

The commercial relationship between parties will be managed by a contract. Services offered by stakeholders along the supply chain are documented and publicly available.

GTA will maintain templates for grain sales contracts as required by industry. Freight and storage contracts are also available.

The contractual relationship will be bound by provisions of one or more of the following:

- Contract law;
- Government legislation;
- Industry rules such as the GTA Trade Rules[24]; and/or
- The provisions of the terms and conditions of the specific contract.

The GTA Trade Rules can be used to govern the rules and guidelines that underpin transactional relationships between parties. Where used, all parties involved in buying and selling grain should be familiar with those GTA Trade Rules and ensure they understand the terminology of the industry.

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[23] Cartagena Protocol on Biosafety - http://bch.cbd.int/protocol/
[24] GTA Trade Rules - http://www.graintrade.org.au/trade_rules

Where used the GTA Trade Rules assist to harmonise the various contracts and trade rules in operation within the Australian market. GTA Trade Rules underpin the GTA Contracts and where used are the basis of trade for other specialty grain contracts. The Trade Rules assist to reflect trade practices and facilitate trade between buyers and sellers in the grain industry.

All parties involved in buying and selling grain should ensure they understand the terminology used by industry:

- Where appropriate all parties involved in buying and selling Australian grain will conduct trading activities in accordance with the GTA Trade Rules, or practices equivalent to or exceeding the GTA Trade Rules, and all parties should have a full appreciation of the GTA Trade Rules;
- Grain contracts will clearly define payment and other contract terms. Where terms and conditions are outside the industry standard, parties will make their counterparties aware of these terms;
- When using industry terminology, buyers will use this in line with the intent of the definition;
- Industry participants will ensure that they understand the nature of the contract, its pricing characteristics, the risks in relation to the contract and under what circumstances and through what mechanism the original terms of the contract can be altered[25];
- Producers should clearly understand at the time of contracting what the implications are in the event of production difficulties and the inability to fulfil contract obligations due to reduced or failed production;
- Where variations to the contract are agreed, these should be confirmed in writing between the parties in a clear and transparent manner;
- Parties to a GTA contract should reference the GTA Dispute Resolution Service in all contracts; and
- Parties to contracts incorporating the GTA Trade Rules are obliged to refer any dispute to GTA for settlement under the GTA Dispute Resolution Service.

Buyers and other industry participants will implement the following protocols:

- Publish all fees and charges associated with any products or services in a transparent and clear manner. This will be achieved by buyers posting all fees and charges on their respective web sites and/or making such information freely available upon application;
- Deduct statutory and industry levies[26] and end point royalties[27], as required by law or contract and remit same to the relevant agency (e.g., Plant Breeder's Rights); and
- Post all grain prices exclusive of GST.

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[25] A Guide to Taking out Grain Contracts – http://www.graintrade.org.au/contracts
[26] Various Government controlled levies by commodity - http://www.daff.gov.au/agriculture-food/levies/grains
[27] PBR Licence and EPR Collection Agreement, list of the varieties and contact details for the Agent - http://varietycentral.com.au/ or http://www.grdc.com.au/director/events/grdcpublications/pbr_epr

Industry participants who offer grain pools will implement the following protocols:

- Where a pool operator posts an Estimated Silo Return (ESR) (or similar terminology) for a forthcoming harvest, that ESR will be a fair and reasoned estimate that the pool operator will be able to justify to potential pool customers;

- ESR will be regularly updated via a posting to the pool operators website at least monthly;
- Pool estimates (expressed on either a Free on Board (FOB) or ESR basis) will be posted net of management and administration fees;
- Advance Pool silo based estimates (ESR) will be posted net of estimated finance and compulsory underwriting costs;
- Loan Payment Pool silo based estimates with fixed draw down schedules will be posted net of estimated finance and compulsory underwriting costs;
- Have in place the necessary skills, payment systems, risk systems/procedures and resources you could reasonably expect to be in place to manage the Pools that they offer and regularly review these to evaluate the currency of their application; and
- Operators of Pools will provide relevant reports on the operations of the Pool to Pool participants. At a minimum these should be detailed reports on the Pools actual performance, operations and returns to Pool participants.

2.7.4 Grain Quality Data Management

Industry will manage the capture, processing and transfer of data according to best practice management guidelines:

- At a minimum, data to be captured and records maintained by the company should include those required for compliance with regulatory requirements and industry standards, including for the purposes of traceability;
- The use of automated processes to capture and transfer data to participants along the supply chain is encouraged;
- Data is captured and stored for periods relevant to its use and purpose;
- Where required, there are documented procedures relating to what data is captured, the mechanism of capture and the storage period for data retention; and
- Other records will be captured and retained based on the individual company Sampling Manual or Operating Procedures Manual.

2.7.5 Financial Management

Industry participants employ financial management processes:

- To ensure that there are adequate resources to meet their objectives;
- To remain solvent;
- To ensure continual operation within the grains industry;
- To ensure they are sustainable, properly capitalised and funded; and
- To ensure they have adequate cash flow to support their operations over the duration of their lives and to contribute to achieving their goals. Sound financial management is undertaken.

At all times industry complies with relevant financial legislation (e.g., Financial Services Reform Act)[28] including any requirement for:

- Record keeping;
- Financial reporting;
- Auditing; and
- Those companies offering financial advice must operate under an Australian Financial Services License.

Companies have a documented procedure relating to financial management.

2.8 Training

This Code encourages professional development though the continual development of training to maintain high professional standards.

All staff including contractors and/or registered officers are to be adequately trained in the requirements of this Code. Where required, all suppliers are audited against their stated competency and records kept.

While the specific training required will differ across the supply chain and depend on the tasks undertaken, industry participants are to ensure that all principals and staff:

- Are trained and given clear guidance so they can competently and efficiently discharge their functions and provide the services they are authorised to provide;
- Are to have an adequate knowledge of the provisions of this Code. There is to be sufficient personnel with the ability to carry out the provisions of this Code.
- Have completed training relevant to their roles (e.g., samplers are trained in industry sampling and testing protocols). Training may be:
    - Formal
    - Informal through guidance and instruction "on the job"
- Undertake training relevant to industry practices and as offered by industry experts (e.g., GTA Professional Development Courses);
- Comply with all relevant industry regulations and / or standards (e.g., sampler training referenced back to Industry Competency Standards);
- Keep skills and accreditations up to date through ongoing training (e.g., yearly refresher training on application of grain standards);

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[28] Financial Services Reform Act - www.comlaw.gov.au/Details/C2005C00498

- Where appropriate, increase their skills through further training;
- Maintain documented evidence of training completed (e.g., Accreditation/Completion Certificate displayed in sample stand); and
- Have the appropriate support and ongoing training to ensure they can carry out their role:
    - Adequately

- In a professional manner
- In accordance with all current regulations and industry standards (e.g., wearing appropriate clothing as per Occupational Health and Safety regulations).

Following appointment and training, all staff involved in particular activities:

- Are to be assessed;
- As required be “deemed competent”; and
- Have their relevant records duly noted.

2.9 Complaints

2.9.1 Customer Complaints

Industry participants will have in place a procedure for dealing appropriately with any customer complaints which may include reference to Australian Standard "Customer Satisfaction - Guidelines for complaints handling in organizations" (ISO 10002:2004, MOD)[29].

2.9.2 Complaints against a Code Signatory

In the first instance any complaint about the conduct of a Code Signatory should be referred to that Code Signatory who should be allowed a reasonable time to address or resolve the complaint.

If the complaint is not resolved to the complainant's satisfaction the complainant should contact the GTA [CEO] [Code Compliance Officer] who can advise whether the complaint falls under the jurisdiction of this Code and the GTA Board of Directors.

Any complaint will be dealt with in accordance with the Complaint Handling Guidelines.

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[29] Customer Satisfaction - Guidelines for complaints handling in organizations" (ISO 10002:2004, MOD). Available at www.saiglobal.com/shop

3. Reference Material

Appendix 1 Glossary & Definitions

AFSL (Australian Financial Services Licence)

An AFS licence authorises an individual and their representatives to provide financial services to clients. Without an AFS licence, a financial services business cannot be carried out.

AOF (Australian Oilseeds Federation)
The peak industry body for the oilseed industry.

AMSA (Australian Maritime Safety Authority)
In relation to grain exports AMSA is focused on policies and guidelines relating to ship construction standards, ship survey and safety, crewing, seafarers' qualifications and welfare, occupational health and safety and the safe carriage and handling of grain cargoes.

APVMA (Australian Pesticides and Veterinary Medicines Authority)
APVMA is an Australian government authority responsible for the assessment and registration of pesticides and veterinary medicines and for their regulation up to and including the point of retail sale. The APVMA administers the National Registration Scheme for Agricultural and Veterinary Chemicals (NRS) in partnership with the States and Territories and with the active involvement of other Australian government agencies.

AQIS (Australian Quarantine Inspection Service)
Refer to Plant Export Operations.

Authorised Representative
In relation to all operational activities of a commercial enterprise outlined in this Code, refers to all staff (permanent, casual, contractor or otherwise employed) that are permitted to conduct the relevant activity.

Cartagena Protocol on Biosafety
The Cartagena Protocol on Biosafety is an international agreement on Biosafety. Its aim is to contribute to the safe transfer, handling and use of living modified organisms (LMOs) – such as genetically engineered plants, animals, and microbes – that cross international borders. The Biosafety Protocol is also intended to avoid adverse effects on the conservation and sustainable use of biodiversity without unnecessarily disrupting world food trade. The Protocol provides countries with the opportunity to obtain information before new biotech organisms are imported.

Certified Reference Material
A sample with a known quality parameter. This sample is used to determine if the testing instrument is operating within known accuracy limits

Code Compliance Officer
Person appointed by GTA for the purposes of dealing with Complaints falling under the jurisdiction of this Code, according to the Complaints Handling Guidelines.

Code Signatory
Any person and/or company who have agreed, in writing, to abide by this Code.

Code of Conduct (2nd Edition, July 2011)
Code developed by GTA on behalf of the grain industry designed to promote best practices and continually enhance behaviour of industry participants.

Codex Alimentarius Commission
The Codex Alimentarius Commission was created in 1963 by FAO and WHO to develop food standards, guidelines and related texts such as codes of practice under the Joint FAO/WHO Food Standards Program. The main purposes of this Program are protecting the health of consumers and ensuring fair trade practices in the food trade, and promoting coordination of all food standards work undertaken by international governmental and non-governmental organisations.

Commercial Resources
Commercial resources for the grain industry refer to the set of tools developed by Grain Trade Australia that enable the facilitation of trade. These include GTA Grain Standards, GTA Trade Rules, GTA Contracts and the GTA Dispute Resolution Service.

Contact Insecticides
Contact insecticides are pesticides that are toxic to insects when brought into direct contact with them. Examples of contact insecticides include Fenitrothion, Dichlorvos and Chlorpyrifos-methyl.

Contract
A contract may be defined as an agreement between two or more persons, which is legally enforceable.

CVD (Commodity Vendor Declaration)
Commodity Vendor Declaration forms are routinely used in the grain supply chain on receipt of grain from a producer or during the transfer of ownership within the trade. These commodity vendor declaration forms can include details such as chemical residue status, variety, GM status and quality status of the grain.

DAFF (Australian Government Department of Agriculture, Fisheries and Forestry)
Under the Export Control Act 1982, DAFF controls grain exports. Plant Export Operations is part of DAFF and is responsible for this task.

Estimated Silo Return (ESR)
May also be referred to using various other terminologies. The ESR for a storage site approved for the delivery of a grain commodity into the respective Pool is generally calculated as the Estimated Pool Return (EPR) plus any applicable commitment or quality premiums, less the estimated "site to sea" costs involved in receiving, storing and moving the grain from the storage site to port/s and onto a vessel.

FSANZ (Food Standards Australia New Zealand)

FSANZ is an independent statutory agency established by the Food Standards Australia New Zealand Act 1991. It works within an integrated food regulatory system involving the governments of Australia and the New Zealand. FSANZ set food standards for the two countries.

Food Standards Code
The Code developed by FSANZ that lists the MRLs on food in Australia and New Zealand.

Grain
Refers to cereal grains, oilseeds, pulses and their products.

Grains Industry Consultative Committee
The Grains Industry Consultative Committee (yet to be named) is the principal advisory forum for Plant Export Operations to consult with the grain and related industries on export certification, export market access, quarantine and other relevant issues.

GTA (Grain Trade Australia)
Industry organisation providing industry with a range of commercial resources to facilitate trade.

GTA Contracts
These contracts developed by Grain Trade Australia provide standard terms and conditions for the trade of grain within Australia.

GTA Dispute Resolution Service
Grain Trade Australia provides a dispute resolution service that is industry based. Its aim is to avoid litigation and thereby reduce the time and expense required to resolve a dispute between parties transacting in the Australian grain industry. This service provides an equitable means to settle a dispute by a committee of industry peers.

GTA Grain Standards
Grain standards are used to measure and describe the physical and biological properties of grain at the time of inspection. These include any varietal classifications that may be developed by external organisations as listed in relevant Varietal Master Lists. Grain Trade Australia develops and distributes the wheat and coarse grain standards for Australia. It also distributes the standards for oilseeds (developed by the Australian Oilseeds Federation), pulses (developed by Pulse Australia) and birdseed (developed by the Queensland Agricultural Merchants).

GTA Standards Committee
Is an industry committee administered by GTA. Its primary role is to review and make recommendations for updates of commodity standards in cooperation with Pulse Australia, Australian Oilseeds Federation and other industry participants.

GTA Trade Rules
These rules, developed with industry consultation by Grain Trade Australia, reflect trade practice and facilitate trade between parties in the grain, feed, oilseeds and processing industries. They govern all disputes of a mercantile, financial or commercial character connected with grain, feed, oilseeds and other commodities when traded under the terms and conditions of Grain Trade Australia.

Harvest Manual
A document that outlines amongst other things various services offered by a storage provider at harvest.

Industry Standards
In this Code, refers mainly to Grain Standards and their application.

IPM (Integrated Pest Management)
Integrated Pest Management is an effective and environmentally sensitive approach to pest management that relies on a combination of common-sense practices. IPM programs use current, comprehensive information on the life cycles of pests and their interaction with the environment. This information, in combination with available pest control methods, is used to manage pest damage by the most economical means, and with the least possible hazard to people, property, and the environment.

Maximum Residue Limits (MRLs)
APVMA sets MRLs for agricultural and veterinary chemicals in agricultural produce, particularly produce entering the food chain. These MRLs are set at levels which are not likely to be exceeded if the agricultural or veterinary chemicals are used in accordance with approved label instructions. At the time the MRLs are set, the APVMA undertakes a dietary exposure evaluation to ensure the levels do not pose an undue hazard to human health. The MRL Standard lists MRLs of substances which may arise from the approved use of those substances or other substances, and provides the relevant residue definitions to which these MRLs apply. Foreign country MRLs may be accessed directly from foreign government websites, the NRS grains database at http://www.daff.gov.au/agriculture-food/nrs/industry-info/mrl and an Outturn tolerance document that provides guideline advice on post-harvest chemicals used in the treatment of stored grain and the MRLs that apply to grains marketed in Australia and overseas and can be found at http://www.graintrade.org.au/chemical_tolerances

NWPGP (National Working Party on Grain Protection)
The NWPGP is the industry body responsible for providing management and leadership to industry in the areas of post harvest storage, chemical use, market requirements and chemical regulations. Refer to http://www.graintrade.org.au/nwpgp

NMI (National Measurement Institute)
The National Measurement Institute is Australia's peak measurement body responsible for biological, chemical, legal, physical and trade measurement. It stipulates a number of requirements for instruments used for assessing grain quality.

NRS (National Residue Survey)
The NRS monitors residues of agricultural and veterinary chemicals and environmental contaminants in Australian food commodities. The cost of this monitoring is largely industry-funded through levies on the animal and plant commodities that are tested.

Non residual fumigants
Used to control insects in stored grain by completely filling an area with gaseous pesticides or fumigants that suffocate or poison the pests within. There is effectively no retention of the pesticide after application.

Objective Assessment Technology
Analysis of grain quality where the result is determined by an instrument (e.g., protein).

PA (Pulse Australia)
The peak body for the pulse industry.

Plant Export Operations
This service is part of the Australian Government Department of Agriculture, Fisheries and Forestry (DAFF). Plant Export Operations provides import and export inspection and certification to help retain Australia's animal, plant and human health status.

QA (Quality Assurance)
Quality assurance is a 'guarantee of excellence' with the adoption of minimum standards of control and monitoring. QA involves a planned and systematic pattern of all actions necessary to provide confidence that adequate technical requirements are established, that products and services conform to established technical requirements, and that satisfactory performance is achieved. Formal systems are often developed on behalf of industry by a peak industry body or association.

Registered Weighbridge
Registered Weighbridge means a weighbridge that is registered with the relevant government or trade authority.

Running Sample
A sample obtained via sub-sampling each load delivered into grain segregation. Compiled based on the tonnage received. The sample is then analysed for all quality parameters to determine if individual loads into the segregation were assessed correctly.

Sampling Manual or Operating Procedures
A document that outlines a range of activities performed by the company when sampling, testing and classifying grain or other activities such as operating a grain Storage facility.

Storage and Handling Agreement
An agreement outlining the storage and handling terms and conditions for the storage and/or warehousing and/or on-farm storage of various grain commodities.

Subjective Assessment
Analysis of grain quality where the result is determined by a sampler using visual analysis

Supply Chain
The grain supply chain includes all elements of on-farm, storage and transport infrastructures

Trade Legislation
Outlines the regulation of measuring instruments used for trade and provides for a system of verification of utility meters and measuring instrument used for trade.

Varietal Master List
This list designates the varietal group into which each variety may be assigned for relevant commodities. The Varietal Master List may be developed by an external organisation to GTA but is an integral part of the GTA Grain Standards.

Variety
Variety refers to a group of organisms within a species, having similar characteristics but not distinct enough to be a separate species.

Visual Reference Guide
The Visual Reference Guide is a Booklet containing a range of definitions and photographic depictions of various defects of grain. Used as a reference for assessment of grain quality parameters listed in standards.

Appendix 2 Technical Guideline Documents

The following tables list technical guideline documents that have been requested by industry as a supplement to the Code.
There are two levels of prioritisation for development of these documents:

2.1 IMMEDIATE DEVELOPMENT

During the 2013 fiscal year, the following technical guideline documents will be developed as a priority. These will be developed concurrently with finalising the Code.

Reference in Code		Document Name – to be Developed in 2013
2.2.1	Testing Equipment to be Used	Falling Number use
2.2.1	Testing Equipment to be Used	Test Weight assessment
2.5	Grain Quality Management	Blending of grain relating to variety. Variety contamination and level in wheat loads received versus outloaded – use of CVD to collect information
2.5.1	Grain Receival	Dispute Resolution and Rejection Procedures at the point of tendering a load for delivery
2.7.3	Contract Documentation	Requirements for the operation of Pools and reporting on performance
2.9.2	Complaints Handling	Complaints Handling Guidelines' that cross references GTA, WQA, Barley Australia, Pulse Australia, GRDC or whatever is the relevant authority on the nature of the complaint

2.2 LONGER TERM DEVELOPMENT

For the following technical guideline documents, a proposed timeframe for development is as listed below. It is expected that additional topics will be added to this list by industry over time and the priority for development may alter based on industry feedback.

Reference in Code		Document Name and Timeframe for Development:	Year
2.1	On-farm Activities	Minimum records required for all on-farm activities – includes Pest Management Plan & link with existing/new programs	2014
2.1.1	Grain Production	Use of contract harvesters, processes to minimise contamination of delivered grain	2014
2.1.3	Grain Movement ex-farm	Proforma Commodity Vendor Declaration by contract & for each truckload tendered where no contract exists	2013
2.2	Sampling and Testing Grain	Sampling Manual and Operating Procedures – proforma content	2013
2.2.1	Testing Equipment to be Used	Operation of sampling equipment	2014
2.2.1	Testing Equipment to be Used	Minimum specifications for each type of probe equipment	2014

Reference in Code		Document Name and Timeframe for Development:	Year
2.2.1	Testing Equipment to be Used	A list of objective versus subjective tests by commodity and equipment available for assessment of each parameter listed in standards. Include associated reference material such as VRG	2014
2.2.3	Sampling and Testing Grain	Grain Testing Equipment monitoring – industry initial approval of equipment, software calibration updates, different calibrations	2013
2.2.3	Trade Certification of Equipment	A list of, explanation and link to relevant Trade Legislation in Australia	2013
2.3.1	Storage Construction & Maintenance	List of the range of storage types and a brief summary of their advantages and disadvantages	2013
2.3.2	Grain Pest & Hygiene Management	Best Practice for storage providers - Insect free storage of grain post-harvest and management of chemical residues according to market requirements. Link to Stored Grain website and relevant documents to assist industry i.e., Pest Management Strategy Develop a list / tick sheet of major requirements	2014
2.4.1	Chemical Regulations	Details of Government Regulators to notify when chemical violations have been detected, guidelines for industry on actions to take when inappropriate residues detected	2013
2.4.2	Industry Practices for Chemical Use	Use of Commodity Vendor Declaration by commodity and market sector	2013
2.5	Grain Quality Management	Vendor Declaration Requirements (include cross-reference to 2.1, 2.4)	2013
2.5	Grain Quality Management	Guidelines on blending of grain and potential outcomes	2014
2.5.1	Grain Receival	Sample collection and retention, including sample labelling requirements	2014
2.5.4	Grain Outturn – Export	Minimum requirements for provision of Certificates by independent inspection companies and laboratories	2013
2.5.4	Grain Outturn – Export	Testing during loading, Cargo Assembly Plan requirements	2014
2.6.2	Transport Processes	GTA Code of Transport Guideline document, Legislation and other Codes	2014
2.6.2	Transport Processes	Rail Transport included in Transport Code or Guideline Document if more appropriate	2014
2.6.2	Transport Processes	Guidelines for a biosecurity area at storage sites for cleaning transport prior to/following loading & unloading	2013
2.7	Marketing	Financial Management Standards	2014
2.7.1	Marketing Australian Grain	Commercial contract variations for quality parameters listed in Standards	2014
2.7.3	Contract documentation	Variety declaration requirements for the stockfeed and container industry under PBR legislation	2013
2.7.3	Levies	List of Levies by commodity, or link to relevant information sources	2015
2.9.1	Code Application	Code application and implementation by GTA members	2013
n/a	n/a	Environmental Management	2015
n/a	n/a	List of relevant and potential national and	2015

Reference in Code		Document Name and Timeframe for Development:	Year
		internationally recognised QA systems that may assist industry	
n/a	n/a	Process flow chart for different end-uses, linking major processes to control and major “hazards”	2015

GRAIN TRADE AUSTRALIA

Australian Grain Industry

Code of Practice

Technical Guideline Document

No. 1

COMPLAINTS HANDLING GUIDELINES

First Edition Published February 2013

Compiled on behalf of the Australian Grain Industry by:

Grain Trade Australia

1. Complaints Handling Guidelines

These Guidelines relate to complaints made against a [Code Signatory][Industry Participant].

1.1 Initial Complaint

Any complaint about the conduct of an Industry Participant will be referred to that Industry Participant who will have a reasonable time to attempt to resolve the complaint in accordance with its complaints handling procedures.

1.2 Complaint to GTA

If in the reasonable opinion of the Complainant the complaint has not been satisfactorily dealt with by the Industry Participant, the Complainant may refer the complaint to the GTA Compliance Officer.

The GTA Compliance Officer will discuss with the Complainant his or her options for the resolution of the complaint and ascertain whether the complaint properly and appropriately falls under the Code of Practice.

If the GTA Compliance Officer believes that the complaint properly falls under the Code of Practice he or she may send the Complainant a *GTA Code of Practice Complaint Form*. All complaints need to be substantiated with evidence of the subject matter of the complaint.

Once the completed form has been returned to GTA it will be assessed by the GTA Compliance Officer who may, if the circumstances warrant, send the completed form to the relevant Industry Participant who will be invited to respond to the matters raised.

If in the opinion of the Compliance Officer the matter should be taken further, the Compliance Officer may refer the complaint to the Board of GTA for review by two directors who will then report to the Board of GTA as to whether the complaint should be referred to a Disciplinary Tribunal, or to mediation.

1.3 Disciplinary Tribunal

A Disciplinary Tribunal will comprise of 3 GTA Board Directors.

That Tribunal may conduct itself as it deems fit, at all times in accordance with procedural fairness and natural justice.

The Tribunal may convene a hearing to inquire into the complaint.

At the completion of any hearing that Tribunal may report to the Board of GTA recommending that;

1. The complaint be dismissed; or
2. The Industry Participant be reprimanded; and/or
3. The Industry Participant's membership of GTA be cancelled, or suspended; and/or
4. The Industry Participant's privileges be cancelled, or suspended; and/or
5. Any conditions which the Tribunal see fit to impose.

The result of any such inquiry and recommendations shall be published on the GTA website.

GRAIN TRADE AUSTRALIA

Australian Grain Industry

Code of Practice

Technical Guideline Document No. 2

TEST WEIGHT ASSESSMENT

First Edition Published March 2013

Compiled on behalf of the Australian Grain Industry by:

Grain Trade Australia

1. Contents

2. Application

For the assessment of Test Weight in all commodities.

3. Discussion on Test Weight Assessment

3.1 What is Test Weight

Test weight is a measure of the density of grain. It measures how much a specific volume of grain weighs.

3.2 Units

In Australia, Test Weight is expressed in kilograms per hectolitre (i.e. the weight of a hundred litres).

3.3 Methods of Analysis

There are a range of methods of analysis used by industry for assessing test weight.

3.4 NMI Regulatory Controls

All reference chondrometer units are certified and approved by the National Measurement Institute (NMI). The NMI specifies a General Certificate, requiring that for the trade of grain, the Test Weight assessment method must meet Maximum Permissible Error specifications. See http://www.measurement.gov.au/Publications/CertificateOfApproval/GeneralCertificates/Pages/default.aspx and refer to the document titled "4/10/0A/- Grain Density Measuring Instruments" for details.
In that General Certificate, there is a requirement that:

- It is the responsibility of the manufacturer or their agents to ensure that all instruments to be tested and marked with this approval number are constructed in accordance with the General Certificate of Approval and its Technical Schedule.
- The filling hopper (height guide) is to be made of suitably rigid material and of a shape that allows the grain to fall into the measuring container (0.5L measure) to produce a repeatable bulk density.
- Any NMI approved weighing instrument (balance) with a verification scale interval of 0.1 g or better may be used to provide mass information for bulk density determination calculations.
- Instruments carry a descriptive marking relating to the manufacturer, pattern approval mark, serial number etc.

- The weighing instrument shall be verified in accordance with the National Instrument Test Procedures.
- Verification of the instrument shall be carried out by comparison with a reference chondrometer (instruments designated as either Franklin, Kern or Schopper are acceptable).
- The verification procedure shall be carried out using a grain sample that is free from impurities and under the same ambient conditions of temperature and humidity where measurements are normally made.
- Take one test sample large enough to fill the filling hopper.
- Carry out three measurements on both the instrument and the reference chondrometer using the same test sample of grain. For each measurement, determine the density of the sample of grain.
- The mean value of the density should then be determined for each instrument.
- The discrepancy of the two mean values shall be within ±0.5 kg/hL.

3.5 Industry Reference Method

As noted in the NMI General Certificate referenced above, reference chondrometers include the Franklin, Kern or Schopper. In Section 5 of all cereal trading standards booklets (e.g., wheat), reference methods for each unit are documented. Refer to the GTA website for details at http://www.graintrade.org.au/commodity_standards

These methods should be used to verify instruments used in the field that are not reference methods.

The presence of the General Certificate means that:

- All instruments used for TW assessment must comply with General Certificate conditions.
- Industry must audit its instruments to ensure compliance with the value ±0.5 kg/hL listed above.
- Where non-compliance is detected, industry should investigate the cause and rectify as soon as possible.

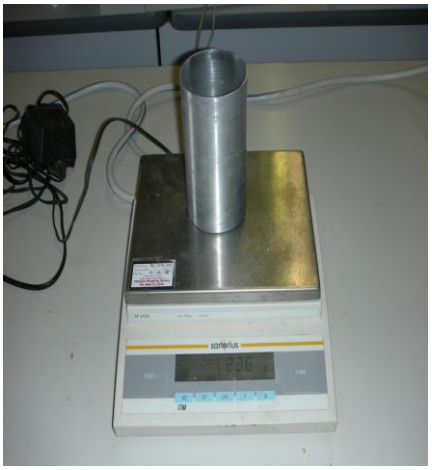
3.5.1 Industry Field Methods

There are various methods used in the field for Test Weight assessment. Industry is free to use these field methods provided they meet the General Certificate requirements stipulated by the NMI.

A field method generally involves measuring Test Weight by weighing a 0.5L sample. The 0.5L sample may be obtained by using a height guide to fill the 0.5L

container or a funnel device. While these field methods can be accurately done, a more accurate result is generally able to be obtained by using a chondrometers.

Pictured below are various field methods used for Test Weight assessment:

When using field assessment methods, industry is strongly encouraged to:

- Certify the equipment a minimum of once a year (e.g., immediately prior to harvest)
- Train staff in the correct method of use
- Regularly monitor the condition of all equipment
- Audit results obtained via provision of samples to third parties or internal assessment using the verification procedure outlined by the NMI

3.5.2 Overseas Methods of Assessment

Test Weight is a quality parameter listed in a wide array of international grain standards. Methods of analysis may differ from Australia but in general the main processes and equipment are similar. For example:

- In Canada, the equipment used is similar to the main method used in Australia, being a Cox funnel (height guide) and 0.5L measure.
- The USA use a similar method, allowing for calculation of the result by the beam balance or using a set of scales.

The major difference between Australia's and Canada's grain grading specifications for example, test weight is assessed after dockage is removed. Where there are large amounts of Foreign Material (FM), this may impact on the result obtained compared with a method used in Australia where FM is not removed before assessment.

Industry should note that generally the market does not stipulate which method is to be used.

3.6 What Errors can Occur During Assessment

There are many errors that may occur when using equipment to measure Test Weight, whether using the reference or a field method. While each may create only a

small error, combined, they may be a significant factor in incorrectly determining the Test Weight of a grain sample.

Potential errors when assessing Test Weight with a potential impact on the result obtained may include the following:

Procedure	Potential Impact on Result Obtained		Potential Resolution
	Higher	Lower	
General - All Methods			
½ litre measure not exact size	Y	Y	Replace
½ litre measure damaged/dented	Y	Y	Replace
Balance not calibrated or level	Y	Y	Re-calibrate, operate only on a level surface. Obtain balance with visible level indicator
Balance not sufficiently accurate (does not measure to 1 decimal place) or used incorrectly	Y	Y	Obtain appropriately accurate balance
½ litre measure containing grain following filling not levelled off correctly	Y	Y	Follow correct procedure and ensure levelled
½ litre container containing grain not zeroed on balance prior to filling	Y		Follow written procedure
½ litre measure not kept still or level during filling with grain	Y	Y	Set-up instrument prior to filling in a position that does not require moving (e.g., when inserting cutter bar)
Conversion from weight in grams to kg/hl not done correctly (multiply by 0.2 or divide by 5)	Y	Y	Develop and display conversion chart on wall, ensure analytical balance in correct mode (if using conversion balance), purchase suitable type of conversion balance
Foreign Material, Unmillable Material etc removed from some samples prior to Test Weight assessment as considered excessive, leading to variable results	Y	Y	Follow written procedure (in all instances sample to be assessed “as is”)
Sample to be used for Test Weight assessment not mixed	Y	Y	Re-sample and divide sample following written

Procedure	Potential Impact on Result Obtained		Potential Resolution
	Higher	Lower	
properly or representative of grain to be assessed			procedure used on-site
Insufficient grain poured into height guide apparatus (i.e., ½ litre measure does not overflow)		Y	Pour grain into height guide using a "container" that holds at least 1kg of grain
Calculated result not rounded correctly to the nearest 0.1 decimal point	Y	Y	Apply correct procedure
Height Guide Method			
Height guide too short (i.e., not calibrated to the ½ litre measure)		Y	Replace, only used approved and verified equipment
Height guide too long (i.e., not calibrated to the ½ litre measure)	Y		Replace, only used approved and verified equipment
Grain poured from container into height guide too high above height guide	Y		Use consistent and repeatable procedure (e.g., rest pouring jug on top of height guide)
Grain poured from container into height guide at variable heights (inconsistent and non-repeatable height) above height guide	Y	Y	Use consistent and repeatable procedure (e.g., rest pouring jug on top of height guide)
Shaking, knocking, moving apparatus during or after filling and prior to removal of cutter bar	Y		Following commencing test do not move instrument until test completed
Pouring grain too slow into height guide	Y	Y	Follow written procedure, use consistent rate of pour
Pouring grain too fast into height guide	Y	Y	Follow written procedure, use consistent rate of pour
Pouring grain process interrupted due to inadequate sample in pouring jar		Y	Re-start test. Pour grain into height guide using a "container" that holds sufficient grain to overflow from height guide when full
Insufficient grain poured into test unit		Y	Pour enough grain into height guide for grain to overflow from height guide (capture "spillage" using large tray under unit)
Jerking, knocking, not	Y		Apply smooth procedure

Procedure	Potential Impact on Result Obtained		Potential Resolution
	Higher	Lower	
smooth or single firm procedure for pushing cutter bar through sample			when inserting cutter bar. Gently toggle cutter bar into slot if a tight fit
Cutter bar removed too slowly		Y	Rapid withdrawal of cutter bar is required
Cutter bar not used		Y	Refer to correct operating procedures
By holding the height guide at the very top, pushing grain on top of the height guide when inserting the cutter bar	Y		Hold height guide steady by holding on side of height guide, rather than exert pressure from the top
Funnel Method			
Funnel too high above ½ litre measure	Y		Re-calibrate height against reference chondrometer
Funnel too low above ½ litre measure		Y	Re-calibrate height against reference chondrometer
Funnel diameter not appropriate	Y	Y	Re-calibrate height against reference chondrometer
Grain poured into funnel too slowly, resulting in grain coming out of funnel slowly		Y	Pour grain into funnel rapidly and in one motion (e.g., “dump” all grain into funnel rather than “pour”)
Method used to fill ½ litre not calibrated according to commodity type	Y	Y	Review written procedure to ensure correct method used

3.7 Impact of Incorrect Assessment & Potential Actions to Take to Rectify

There may be significant consequences arising from the incorrect assessment or a dispute between two parties on results of a Test Weight assessment. To minimise the occurrence of such events, or the impact, a range of measures as outlined in this Technical Guideline Document (TGD) can be undertaken. Other measures include:

- Verifying all sampling and testing equipment pre harvest, especially for that equipment used in Test Weight assessment (e.g., analytical balance)
- Ensuring a representative sample is taken for assessment (e.g., sampling procedure followed, sampling equipment not contaminated with prior sample)
- Routine collection of audit samples, and cross-checking results with other parties (e.g., laboratory using a reference method)

- Documenting procedures involved in the sampling and assessment of grain (e.g., as part of the storage operating procedures for a receival site)
- Checking existing instruments to ensure compliance and that they continue to operate as per their specifications and intended purpose. Damaged equipment should be inspected prior to commencement of grain testing (e.g., equipment such as height guide not bent or damaged in any way)
- When upgrading or purchasing new equipment, only purchase suitable instruments and seek certificates from the suppliers that equipment meets any industry or regulatory requirements (e.g., complies with NMI General Certificate and has a verification label attached)
- Ensure all staff are adequately trained in use of equipment and that training is ongoing to ensure staff are deemed competent at all times (e.g., annual refresher training)
- Have a documented dispute assessment procedure that outlines the processes to be followed when a result obtained is disputed. In the case of Test Weight:
    - Consider allowing a re-test if results are within a particular tolerance from the minimum standard
    - Consider adoption of other measures such as allowable tolerances where the potential impact is fully known
    - Investigate all activities associated with the test, including those of the other party involved in any dispute. This includes equipment used, monitoring of the equipment etc as outlined in this TGD

GRAIN TRADE AUSTRALIA

Australian Grain Industry

Code of Practice

Technical Guideline Document No. 3

SPROUTED GRAIN ASSESSMENT

First Edition Published March 2013

Compiled on behalf of the Australian Grain Industry by:

Grain Trade Australia

1. Contents

2. Application

For the assessment of sprouted grain in cereal commodities.

Industry should note the following:

- The assessment of sprouted grain and associated quality parameters in barley is currently under review and this Technical Guideline Document (TGD) may be updated following the outcome of that review;
- A separate quality parameter called Shot may exist in some standards, generally being described as the early stages of grain sprouting. Different tolerances may exist for shot and sprouted. In many instances while definitions and tolerances may differ, reference to sprouted grains in this TGD may equally apply to shot grains;
- This TGD mainly focuses on the use of the Falling Number (FN) instrument to assess sprouted grain, as this is the most common instrument used by industry; and
- This TGD does not include a detailed description of the Rapid Visco Analyser (RVA), however some information on the RVA is included.

3. Discussion on Sprouted Grain Assessment

3.1 What is Sprouted Grain

Sprouted grains are those grains in which the covering of the germ is split. It includes any further advanced stage of growth of the germ. Note that for different commodities:

- The level and extent of the split of the germ may vary before being classified as sprouted.
- Visual Recognition Standards Guides should be reviewed to determine the visual appearance of sprouted grains for each commodity.

Grains that have had the germ knocked off or scalloped out due to header damage, or grains with “pinholes” are generally not included in the definition of sprouted grains.

Note that there may also be tolerances for grain affected by drying operations, where the grain is visibly sprouted but the FN may not be impacted.

3.2 Standards to Apply

In Australia, standards for shot and/or sprouted may differ by commodity:

- For commodities such as wheat and barley there is a nil tolerance for visually sprouted grain in most of the milling and malt grades, unless a reference method is conducted.
- Either a tolerance or an unlimited tolerance (i.e., not applicable) for sprouted grain in feed grades depending on the commodity.

For those commodities where a reference method may be used to assess quality, the result over-rides the visual assessment of sprouted grain. The implications for industry are that:

- The milling quality of sprouted grain cannot be accurately determined via visual analysis.
- If sprouted grain is in a sample and is not visually detected or is present at levels unable to be detected, grain quality may be impacted.
- If industry relies on a visual assessment, the detection of one sprouted grain may mean grain is assessed as feed, when the grain may be of a higher quality.
- As various reference methods may be permitted, industry is free to choose which method is selected, recognising that a different result may arise depending on the method used.

3.3 When to assess Sprouted Grain

a) Visual - when applying industry standards and a tolerance exists on the level of visually sprouted grain, each sample must be assessed for this parameter.

b) Reference method - if an industry standard contains limits for one or more reference methods related to sprouted grain (e.g., FN or RVA), industry may or may not choose to apply that reference method. At any time industry may choose to assess a sample using the reference method. In many instances, depending on contractual requirements this may occur:
    - When sprouted grain is visually detected; and/or
    - It is suspected that sprouted grains may be present in the sample; and/or
    - The sample appears to be or is thought to be affected by weather.

Industry should note:

- If a sample contains visually sprouted grain and a reference method is not conducted, there may be a risk of that grain not meeting market requirements when supplied to a customer.
- There may not always be a strong correlation between the percentage levels of visual sprouting and FN test results, even when the visual assessment is being performed by highly trained and experienced personnel.
- Sound, non-sprouted grain can still have a low FN due to localised seasonal conditions during crop growth and ripening.
- Some varieties of grain are known or suspected to have inherently low FN which may become more apparent when they are grown under certain conditions.
- There are also differences in sprouting tolerances between varieties which may make FN results more difficult to predict from overall sprouted grain counts.
- Heavily sprouted grain that has been damaged during artificial drying may have a high FN and is rejectable in milling grades under GTA standards for wheat.

3.4 Regulatory Controls

There are no regulatory controls placed on the assessment of sprouted grain, use of the Falling Number unit or Rapid Visco Analyser in Australia.

The regulatory body, being National Measurement Institute (NMI), has determined at this point in time that "such controls are not feasible".

3.5 Methods of Analysis

There are generally two recognised methods for the assessment of sprouted grain (or determining the impact on quality associated with this parameter):

a) Visual - The visual detection and quantification (counting) of sprouted grains in the grain sample. Sprouted grain counts are expressed as a percentage (by count).

b) Reference Method - The Falling Number method (or Rapid Visco Analyser for barley). In Australia, no allowance in the FN method is made for the moisture content of the grain or for elevation above sea-level where the sample is assessed. In Section 5 of relevant cereal trading standards booklets (e.g., wheat), reference methods for each unit are documented. Refer to the GTA website for details at http://www.graintrade.org.au/commodity_standards.

   The FN method is internationally recognised and in GTA Standards the FN result always over-rides the visual assessment result. Generally a FN test is only done only on a load sample that contains sprouted grain which would otherwise be downgraded to a lower grade.

   FN results are expressed in seconds. The FN result for two parcels of grain mixed together cannot be averaged based on the tonnage those samples represent, as there is not a linear relationship between the level of weather damage and the number of seconds the test takes. Instead, a formula using the Perten Liquefaction Number must be used. See www.perten.com.

   RVA results are expressed as a whole number.

3.6 Field Assessment

As noted above, assessment of grain may occur either visually or using a reference method such as the FN or RVA.

3.6.1 Load by Load Assessment

Where sprouted grain is detected, depending on the commodity:

- Assessment of quality using a reference method on a load by load (i.e., each sample) basis is preferred

- The GTA Standards recommend that a FN or RVA test is done on a load by load basis.

3.6.2 Running Sample Assessment

For assessing sprouted grain in situations where a FN or RVA unit is not available at a grain receival site for load by load testing, running sample assessment involving the use of the FN machine to monitor the 'stack quality' is recommended.

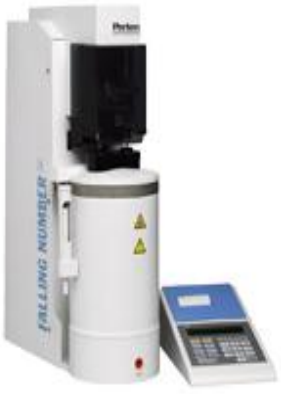
Where relevant, Section 5 of the trading standards (e.g., wheat) contains details of a method that may be used. Refer to the procedure titled "Defective Grain Assessment of Sprouted Grain – Field Evaluation". This procedure lists options for testing on a running sample basis (or an alternative procedure).

Industry should note:

- Sprouted grain assessment in the field using this method may be relatively inaccurate if not conducted correctly.
- There are field test kits available that may approximate the FN value and assist in these situations. These may be more accurate than a simple visual assessment in estimating weather-damage enzyme levels in the grain.

3.6.3 Assessment Equipment

Pictured below is some of the equipment used for Sprouted grain assessment:



When using this equipment, industry is strongly encouraged to:

- Service the equipment a minimum of once a year (e.g., immediately prior to harvest)
- Train staff in the correct method of use
- Regularly monitor the condition of all equipment
- Audit results obtained via provision of samples to third parties or internal assessment

3.6.4 Overseas Methods of Assessment

Sprouted grain and/or FN are a quality parameter listed in a wide array of international grain standards. Methods of analysis may differ from Australia but in general the main processes and equipment for reference assessment are similar.

The major difference between Australia's and many overseas methods is that Australia does not adjust the weight of flour used in a FN test based on the moisture content of the grain or the elevation above-sea level where the sample is assessed.

Industry should note that generally the market does not stipulate a method to be used when specifying limits in contracts.

3.7 What Errors can Occur during Assessment

There are many errors that may occur when assessing a sample for sprouted grain, whether using the field or reference method.

FN tests are likely to be far more prone to sampling errors than other quality tests performed on a truckload of grain, because sprouted and non-sprouted grain cannot be blended evenly and an average FN result obtained. Loads where sprouted and non-sprouted grain has been deliberately layered or blended have the risk of lowering the quality of entire parcels of grain.

Apart from sampling, any physical or chemical testing procedure will be influenced by things such as operator training and technique, general cleanliness of the testing area, purity of reagents (such as water), temperature and other environmental factors. The manufacturer of FN machines, Perten, has published a number of methodology check points (refer www.perten.com) that describe some of the potential sources of error.

Potential errors when assessing sprouted grain with an impact on the result obtained may include the following:

Procedure	Potential Impact on Result Obtained		Potential Resolution
	Higher	Lower	
General - All Methods			
Sub-sample to be used for assessment not representative of grain parcel	Y	Y	Re-sample and sub-divide sample following industry standards
Although sample contains a large amount of 'pin holes', a potential precursor to sprouting, reference method testing not done	Y		Conduct a reference method test such as FN to determine quality of grain
Although sample contains a large amount of 'knocked off germs', a potential indication that sprouting has occurred and shoots were knocked off during the harvesting and handling operation, reference method testing not done	Y		Conduct a reference method test such as FN to determine quality of grain
Grain received on basis of visual sprouted grain assessment without reference method testing done	Y	Y	Conduct a reference method test such as FN to determine quality of grain
Falling Number (FN) Unit Operation			
FN unit not maintained or serviced	Y	Y	Service annually before main usage, such as harvest
FN unit not calibrated	Y	Y	Re-calibrate using Perten guidelines. Follow written procedures for equipment maintenance operating at site
Grinder used to obtain flour grist not maintained or serviced	Y	Y	Service unit annually. Follow written procedures for equipment maintenance operating at site
Grinder sieve apertures are worn and therefore not the correct specifications	Y	Y	Replace sieve. Follow written procedures for equipment maintenance operating at site
Grinder contains residue from previous sample	Y	Y	Clean grinding chamber, cyclone and filter bag on a regular basis and more frequently if poor quality

Procedure	Potential Impact on Result Obtained		Potential Resolution
	Higher	Lower	
			grain is assessed. Tap cyclone with plastic donger after each grind to remove residue
Grinder contains residue from previous sample	Y	Y	Clean sample collection container after each test
FN equipment (test tubes, plungers, stoppers etc) contain residue from previous sample	Y	Y	Thoroughly clean and remove all residue after each test and prior to using again
Insufficient amount of grain ground in grinder	Y	Y	Grind adequate amount of whole grain, using a recommended minimum of 250grams. Follow written procedure for equipment use
Ground sample not mixed prior to weighing flour sub-sample	Y	Y	Mix thoroughly prior to obtaining sub-sample for testing
Incorrect weight of ground sample used for assessment, due to balance not accurate, ground sample holder not tared or ground sample remains in funnel when pouring into test tube	Y	Y	Obtain the required 7grams of flour. Check balance operation and adjust if necessary. Check funnel aperture for any residue flour
Distilled water not used in FN unit		Y	Re-fill unit with distilled water
Water in FN unit not boiling		Y	Visually inspect water to ensure boiling before inserting tubes. Ensure FN unit operating correctly
Insufficient water in FN unit	Y	Y	Re-fill. Inspect regularly during use. Consider use of cooling tower to lessen evaporation
Improper water used in test tube	Y	Y	Use distilled water only
Distilled water to be placed in test tube is at incorrect temperature	Y	Y	Temperature must be as close as possible to 22^{o}C
Lesser amount of distilled water placed in test tube	Y	Y	Obtain 25ml of distilled water using appropriate measuring or dispenser device. Follow written procedure
Ground sample and distilled water in		Y	Shake vigorously. Obtain

Procedure	Potential Impact on Result Obtained		Potential Resolution
	Higher	Lower	
test tube not thoroughly shaken or not shaken for sufficient period			automatic shaker. Visibly inspect each tube before placing in FN unit
Ground sample remains on bottom of stoppers after shaking test tube	Y	Y	Wipe residue remaining on the bottom of stoppers onto the test tube
Residue on side of test tube not pushed into flour/water mixture in test tube after shaking is completed	Y	Y	Push residue down into test tube. Follow written procedure
Plunger bent, broken, not correct weight	Y	Y	Replace plunger. Check equipment prior to using
Time between placing ground sample into distilled water and inserting into FN unit too long	Y	Y	Insert as quickly as possible. Follow written procedure
Visual Assessment			
Insufficient time taken to view entire half litre sample, resulting in sprouted grains being undetected		Y	Follow correct procedure. Re-train staff if required
Operator not adequately trained to detected sprouted grain, or simply cannot visually see it		Y	Re-train staff if required. Ensure staff competent
Reference material, including Visual Recognition Quality Guides, not used or referred to during analysis	Y	Y	Purchase and prominently display appropriate material. Refer to material regularly
Sample not assessed under conditions of good lighting		Y	Replace lighting to ensure “good natural” lighting available. Use magnification lamp
Split germs not detected as these were thought to be shadows		Y	Re-train staff. Use magnification lamp
Running Sample Assessment			
Samples taken infrequently or representing a large tonnage received, resulting in large tonnage received prior to receipt of reference method result		Y	Increase frequency of sampling. Reduce time taken between assessment and notification of results
Too long a period between collection of running sample and receipt of reference method results, resulting in large tonnage received using outdated assessment criteria		Y	Increase frequency of sampling. Reduce time taken between assessment and notification of results
Adjustments to visual sprouted grain count versus reference method result does not provide sufficient flexibility to		Y	Review and revise procedure. Increase frequency of sampling.

Procedure	Potential Impact on Result Obtained		Potential Resolution
	Higher	Lower	
prevent receipt of out of specification product, resulting in grain that fails reference method tolerance in standards			Reduce time taken between assessment and notification of results. Commence load by load testing
Large tonnage received using outdated assessment criteria before the next reference method result is obtained, as industry aware of the length of the delays of receiving this data at the receival site		Y	Review and revise procedure. Increase frequency of sampling. Reduce time taken between assessment and notification of results. Commence load by load testing
The tolerance for sprouted grain for the first day grain is delivered after a rain event is incorrectly set by the receival agent (not set for example at a conservative level to protect the integrity of the stack), resulting in initial tonnage received out of specification		Y	Review and revise procedure
Level of sprouted grain visually able to be received set too conservatively, resulting in some grain rejected or downgraded (i.e., has a high FN that may have met the standard for that grade)	Y		Review and revise procedure
Adjustment of visual tolerance for sprouted grain adjusted too slow, resulting in some grain rejected or downgraded that could have been received (i.e., has a high FN that may have met the standard for that grade)	Y		Review and revise procedure. Reduce time taken between assessment and notification of results. Commence load by load testing

4. Impact of Incorrect Assessment & Potential Actions to Rectify

There may be significant consequences arising from incorrect assessment or a dispute between two parties on results of a sprouted grain assessment. To minimise the occurrence of such events, or the impact, a range of measures as outlined in this TGD can be undertaken.

Other measures include:

- Verifying all sampling and testing equipment pre harvest
- Ensuring a representative sample is taken for assessment (e.g., sampling procedure followed, sampling equipment not contaminated with prior sample)
- Routine collection of audit samples, and cross-checking results with other parties (e.g., laboratory using a reference method)
- Documenting procedures involved in the sampling and assessment of grain (e.g., as part of the storage operating procedures for a receival site)
- Checking existing instruments to ensure they continue to operate as per their specifications and intended purpose. Damaged equipment should be inspected prior to commencement of grain testing (e.g., FN unit should not be damaged in any way)
- When upgrading or purchasing new equipment, only purchase suitable instruments and seek certificates from the suppliers that equipment meets any industry or international standards
- Ensure all staff are adequately trained in the use of equipment and that training is ongoing to ensure staff are deemed competent at all times (e.g., annual refresher training)
- Monitor the quality of grain received, stored throughout its storage period and prior to or on outturn (e.g., despite “no sprouted grain received” conduct FN tests on all running samples, inspect grain routinely during storage and test prior to or on outturn)
- Recognise that quality may change in storage despite storage under optimal conditions (e.g., FN may increase over time in storage)
- Retain samples of grain received and outturned for assessment in a dispute situation
- Have a documented dispute assessment procedure that outlines the processes to be followed when a result obtained is disputed. In the case of sprouted grain:
    - Consider allowing a re-test if results are within a particular tolerance from the minimum standard (e.g., within 10% of the limit)
    - Consider the method of obtaining a further sample to conduct a re-test (e.g., from the sample bucket, re-probe the truckload tendered for delivery, sub-divide sample received from the other party)
    - Consider which result following a re-test is to apply (e.g., average of both results, accept the higher result, accept the last result)
    - Consider adoption of other measures such as allowable tolerances where the potential impact is fully known (e.g., within 10 seconds of the tolerance)
    - Investigate all methods and procedures associated with the test, including those of the other party involved in any dispute. This includes equipment used, sampling method, monitoring of the equipment, method of analysis (e.g., visual v FN), staff training etc as outlined in this TGD.

