

REPORT ON THE POST HARVEST GRAIN TECHNICAL FORUM

Friday, 18th March 2011

Plant Research Centre
South Australian Research & Development Institute

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1. INTRODUCTION AND BACKGROUND

The 2010 grain harvest was very difficult across south eastern Australia due to the large crop and unseasonal rainfall November- January. Grain was often downgraded for several reasons including sprouting, black point of wheat and barley, mould and wrinkle coat in lentils, and white grains or pink stain in wheat. However, there were apparent inconsistencies in the downgrading at different silos leading to confusion amongst primary producers and a loss of confidence in the application of grain receival standards and operators.

In response to this situation the South Australian Farmers Federation Grains Industry Committee (SAFFGIC), with the support of the South Australian Grain Industry Trust (SAGIT) and South Australian Research and Development Institute (SARDI) convened a meeting held on 18th March 2011 at the Plant Research Centre, SARDI to which representatives of each sector in the grain “chain” were invited. A list of attendees and the organisations they represent is at Appendix 1. The meeting was facilitated by Ron Storey of Storey Marketing.

The purpose was to review and identify key issues associated with the 2010 harvest and develop an action plan based on this feedback and the technical information provided to the meeting by the scientists. This “plan” would not just assist the various players in doing better at future harvests but also provide a consistent basis for input into the various reviews. The Terms of Reference for the Reviews (now three) are at Appendices 2, 3 & 4

It was generally agreed that government regulation was not desirable but that the industry itself must do more to self-regulate in terms of setting and applying standards throughout the chain. To not do so only created dissatisfaction, and could also put the reputation of the industry as a reliable supplier of quality grain at risk.

2. THE 2010 HARVEST EXPERIENCE

2.1 Growers, harvest impacts and returns – Michael Schaefer (SAFFGIC)

The major concerns expressed by growers during the 2010 season included:

- Lack of information on stocks x grade, quality, volume on a site/port zone basis.
- Inconsistent classification of grain within and between receival sites
- Lack of clear and consistent definition of technical specifications regarding grain quality.
- Inaccuracies in calibration
- Lack of “falling number” machines at many grain receival sites, and an over reliance on visual assessment.
- Slow reporting of grain quality assessments
- Lack of maintenance budget at grain receival sites leading to equipment failures and intake delays.
- Lack of information about the seriousness of black point problem in barley.

2.2 Receival standards, how they are set and the role of Grain Trade Australia (GTA) – Sean Flanery (GTA)

- GTA has a standards subcommittee that sets grain receival standards.
- Reference grain quality assessment methods are suggested by GTA (on the GTA website) but receival agents are free to choose any method which will deliver the standard. They are not mandatory, nor are they audited for performance.
- GTA has a voluntary code of practice for grain quality assessment.
- Quality is checked at receival, on exit from receival point and again prior to delivery to the customer
- There are no specific outturn standards for bulk handlers to reflect the market/customer requirements. By default, the receival standards have become the outturn standards.
- All components of the grain production system have a vested interest in getting grain quality assessments correct.
- The accuracy of subjective (visual) assessment of grain quality was discussed.

2.3 Traders, as users/exporters in the system – Rosemary Richards (Australian Grain Exporters Association (AGEA))

Key points raised by Richards and subsequent discussion included:

- In practical terms the receival and out turn standards are the same.
- The specifications are basic minimum – sellers need more information so that they can properly represent the product to customers, and are not getting it.
- Grain receival standards must be rigorously applied to ensure outturn standards requirements are met. From an exporters viewpoint just being given the receival standard is not enough. More information on the actual quality in the bin is needed to meet customer requirements.
- Correct and timely information on grain quality pre and post shipment is critical. Exporters/traders need to know grain quality in each stack so that grain can be sold with confidence. There was less quality info coming from SA, on stock held at sites (even exporters' own stocks)
- Reporting of grain quality in harvest samples needs to be more rapid. It is critical for planned marketing.
- Objective measurement of grain quality (e.g. Falling Number) is preferred over subjective measurement.

2.4 End users, as buyers from the system

Representatives from the milling, malting and stockfeed industries provided an overview of the grain quality issues faced by their industries. Key points raised by these representatives and subsequent discussions included:

Milling

- Lack of consistency in grain quality is a key issue. Variable grain quality leads to variable product which does not meet customer requirements. Objective measurement is the key.
- This season, key problem has been inconsistency within stacks mainly in relation to sprouting. Would objective measurement reduce inconsistency within stacks?

Maltsters

- Negotiate individually with bulk handlers.

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- Black point in barley does not appear to affect malting quality. Barley with black point is currently downgraded due to a perception issue by maltsters, not from a technical quality standpoint.

Stockfeed

- Generally speaking, the stockfeed industry can make use of, and chooses, downgraded grain. In wet harvests, badly downgraded and sprouted grain can lead to toxicity (e.g. aflatoxins) and increased livestock mortality.
- Shot grain has equivalent energy to sound grain, but binders need to be added to stock feed to manage any potential toxin levels. .
- Low protein is an issue since it requires addition of oils etc to bring it to customer requirement.
- Contamination of grain with weed seeds is a key issue and receival standards need to reflect this. For example, stock feed suppliers (and millers) have a nil tolerance for heliotrope seeds in grain as it is highly toxic, particularly to horses. However, the current grain quality standards allow for 4 and 8 heliotrope seeds per half litre for barley and wheat respectively.
- Nil tolerance for heliotrope would mean that some farmers would not be able to grow grain. Could they not clean it?

2.5 Bulk handlers, as system providers - Andrew Hannon (Viterra Ltd)

Key points raised by Hannon and in the subsequent discussion included:

- Logistics is a key issue for Viterra. Bulk handlers are competing with growers etc. for transport during the busy harvest period. Poor quality of rail network in SA was a key limitation in shipping out grain during harvest.
- 2010 harvest was challenging for all due to size of harvest and rainfall. Viterra had insufficient Falling Numbers machines for each grain receival site to have a machine. Viterra adopted a field observation method backed by Falling Numbers machine calibration every 1,000 tonnes and Viterra believes measurements of grain quality by Falling Numbers or visual observations were similar, but no evidence provided.
- Growers could request a falling number test.
- Insufficient trained staff available to manage all grain receival sites. Casual staff employed to meet shortfall. Even with experienced staff on the road they were not able to cope with exceptional quality situations in the face of a record and difficult harvest.
- AWB Grainflow had Falling Numbers machines at all receival sites.

2.6 Breeders

Breeders not really affected unless the receival standards change. Breeders do have concerns that perceived quality problems which arise from actions taken by blending in the supply chain, are driving calls for changes to receival standards. This could impose very significant imposts on the selection criteria for breeders by extending breeding development times by up to 5 years or more and close down many varieties which might be released; this would be a huge cost to growers if the inherent quality of what they are delivering is meeting the standards, but the actions of supply chain managers and traders is to blend and lower the quality being outturned.

Breeders strongly support more **transparent flow of information of quality of grain received, versus that which is being outturned.**

3. TECHNICAL FORUM

3.1 Sprouting and Falling Numbers

Associate Professor Daryl Mares (University of Adelaide) provided background to the issues surrounding the use of Falling Numbers machines to assess grain sprouting. Key points raised by Mares and in the subsequent discussion included:

- According to the GTA, Barley Standards 2010/2011 and GTA Wheat Standards 2010/2011, the Falling Number method is based on the unique ability of α -amylase to liquefy a starch gel. The Falling Number is defined as the time in seconds required to stir plus the time it takes to allow the stirrer to fall a measured distance through a hot aqueous gel undergoing liquefaction.
- In the GTA Standards, Falling Number results over-ride the visual assessment of shot and/or sprouted grain.
- According to Mares, Falling Numbers is not a failsafe method of assessing sprouting as Falling Numbers standards do not take into account the level of sprouting and Falling Numbers is not linearly related to the amount of α -amylase activity. As a result, blending is very risky and having one badly sprouted grain in an otherwise sound harvest sample can have a dramatic effect on the Falling Numbers result.
- Other potential measures of sprouting were raised during the discussion including NIR and Elastic Response. Many of these alternate methods are not commercially available.
- A meeting following the 1982/83 harvest which also had sprouting issues made a number of recommendations. Few were progressed and the same problems exist today.

3.2 Black point in wheat

According to Mares, black point in wheat can result in black specks in flour, semolina, noodles and pasta and affected grain is more susceptible to sprouting. Research has suggested that black point in wheat is caused by a physiological problem rather than a pathogen.

3.3 Black point in barley

Black point in barley has no adverse impact on malting quality even though current standards for malting barley stipulate grain must have less than 10% black point (in a 100 grain sample). It is a perception issue. Issue may be that in the case barley downgraded to feed, the information does not go to the malt buyer; therefore normal commercial buyer/seller trade does not occur.

3.4 Mould in lentils

Jenny Davidson (SARDI) provided an overview of mould in lentils. Key issues raised by Davidson and in the subsequent discussions included:

- Receival and export standards for mould in lentils vary considerably.
- Mycotoxins have not been detected in analysis of supposedly mouldy lentils.
- It is very difficult to assess mould in lentils at receival sites due to variation in contamination.
- Mould identification is very slow – 2-3 weeks. Toxin analysis requires 4-5 days.
- Bulk handlers are reticent about accepting lentils which are visually affected even if there is no mould present. This is a result of export markets being driven by visual appearance of lentils with any defects like mould resulting in downgrading or rejection.

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- Wrinkle seed coat in lentils was caused by rain in December.

3.5 White Grains, Pink Stain

Dr. Hugh Wallwork (SARDI) provided an overview of White Grains and Pink Stain in wheat. Key issues raised by Wallwork and in the subsequent discussions included:

- *Botryosphaeria* sp. isolated from white grains. Work in Queensland has indicated that weaner pigs fed with *Botryosphaeria* infected grain were not adversely affected. Infected grain should be safe for feed uses.
- Can be confused with head scab caused by *Fusarium graminearum* that produces a toxin – deoxynivalenol (DON).
- It is possible to analyse affected seed prior to harvest to determine if the cause is *Botryosphaeria* or *Fusarium graminearum*.
- Not able to isolate any organism from Pink Stain affected wheat other than saprophytes.

3.6 EyeFoss Project

Sam Openshaw (FOSS) provided an overview of the EyeFoss project. Key issues raised by Openshaw and in the subsequent discussions included:

- EyeFoss utilises imaging technology to objectively assess grain quality.
- Initial calibration assessments are varied. However, calibration for some defects (e.g. stained wheat) have been promising and will continue.

4. SYNTHESIS OF ISSUES

Based on information provided on the 2010 grain harvest and during the Technical Forum, the key issues to emerge were:

- **Communication.** Across the grain production system, there is a clear lack of information on stocks x grade, quality and volume on a site/port zone basis. There was also a lack of understanding of grain quality specifications, standards, and methods of assessment. Moreover, there is a lack of appreciation of the varying requirements of the different components of the grain production system. In short, transparency and better flow of information across the chain is the critical factor – achieve this and commercial parties will respond to sort out the rest.
- **Grain receival versus outturn standards.** In the absence of outturn standards to which the bulk handlers have to perform receival standards have become the default outturn standards, the receival standards are totally unsatisfactory for exporters to properly represent and meet customer requirements. It means Australian grain tends to be offered at the lowest common denominator, because exporters cannot take the quality risk when they are only guaranteed receival standards by the bulk handling companies.
- **Subjective vs. objective grain quality testing.** There is confusion regarding the usefulness and accuracy of subjective and objective testing of grain quality particularly in relation to sprouting. There is an urgent need for more reliable objective testing methods.
- **Lack of investment in alternate testing methods.** Much focus during the 2010 harvest was placed on the use of visual and Falling Numbers assessments of grain quality. Whilst objective measurements (e.g. Falling Numbers) of grain quality are generally preferred, they are not failsafe and can be more time consuming. Several

alternate methods of assessing grain quality (e.g. NIR, EyeFoss) were discussed during the technical forum and deserve additional attention.

5. KEY ISSUES & RECOMMENDATIONS

- Grain Trade Australia (GTA), as the industry body in charge of grain receival standards and providing advice on testing methods, needs to play a stronger lead role in communication and education so that customers at both ends (including producers when they deliver grain, and buyers/exporters when they receive grain) better understand the standards, and how they are measured, so that they can have greater certainty in their contracts.
- Inconsistency of classification at silos is a major cause of discontent. It is not a new issue, but is highlighted when wet or otherwise difficult harvests arise. More needs to be done with communication and training to overcome this inconsistency. Again GTA, who advises on methods of assessment but has no power to enforce them, should play a lead role in ensuring implementation of the standards, consistency in training of silo staff, and achieving better consistency in results.

It was generally agreed that whilst no sector wanted government regulation, the industry itself needed to lift its game in maintaining its own standards across the supply chain. The possibility of independent industry audit and certification was discussed as being an option if voluntary measures did not work. Should receival agents be accredited? Such an approach to industry self-regulation needs to be further developed in the interests of all sectors, and the industry as a whole.

Recommendation 1 : That this forum write to GTA Standards Committee requesting an assessment of (a) introduction of a single training authority/agent for all receival agents, and (b) introduction of a regular, independent audit of Bulk Handling Companies and their performance in meeting receival standards. Grains Research & Development Corporation (GRDC) to be approached to invest in the R&D required to set up this level of grain quality assurance, but not to fund the continuing delivery of that service.

- Operating rules and practices for harvest need much better communication to growers. Viterra Ltd is investigating areas for improvement in its review.

Recommendation 2 : That all bulk handling companies need to address the issue of better communication with growers on receival standards, classification processes and related receival site operations.

- Currently much of the grain quality assessment at the silo is subjective or visual. The need for more objective methods of testing is obvious and requires greater investment in research and development by the industry, especially the storage and handling sector. Apart from individual technical entities, there seems to have been little development in improved methods, and that which had been developed often did not get to market. This required an urgent and properly funded program involving all sectors of the industry, including scientists and based on priorities set by the industry itself.

Recommendation 3 : That a combined bulk handling company - GRDC working group be established to assess the R&D required to progress and enhance objective grain quality testing, to contract that research and ensure the adoption of the outcomes.

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- There needs to be a faster turnaround in analysing grain samples with problems, with the potential for greater use to be made of local capacity, especially within SARDI.

Recommendation 4: That SARDI provide to bulk handling companies and others, details of the grain assessment services it can provide on a cost recovery basis and associated turnaround times.

- Post-harvest access to and transparency of receival data such as stocks and quality is a major concern for owners of grain stocks, especially producers, users and exporters. This also impacts the quality of information flowing through to researchers, breeders and the like. The claim that the information was the property of the bulk handling companies and was commercial-in-confidence has not been tested, however it was identified as a matter requiring resolution and is specifically noted as one of the terms of reference of the SA parliamentary inquiry and the Senate Inquiry. Given the vested interest of Bulk Handling Companies and their shareholders in this matter, it will be for other members of the supply chain (growers, exporters, end-users) to argue this matter in both the SA Government and Federal Senate Inquiries.

Recommendation 5 : That growers, exporters and end users provide detailed submissions to the SA Government and Federal Senate Inquiries on the need for producers, users, exporters and plant breeders to have access to and transparency of grain receival data (volumes, quality etc.) both during and post harvest.

- Infrastructure and logistics such as road and rail need investment to match any improvements in grain receival processes. This will require industry and government partnerships to get the best mix.

Recommendation 6 : That all parties in their submissions to government inquiries highlight the importance of improved road and rail freight infrastructure as an integral part of efficient operation of the storage and delivery system.

- The outcomes of the forum, together with more detailed action plans will be progressed in coming weeks with GTA, with the Viterro review, and with both the SA Parliamentary Inquiry and the Federal Senate Inquiry.

Recommendation 7 : That a working group of SAFFGIC, GPA, GTA, PIRSA, GRDC and AGEA representative be formed to progress Recommendations 1 to 6, particularly in terms of who does what. There is a need for a combination of SA parties to progress the submission etc. for the SA inquiry, and a group of Federal parties (GPA, AGEA, etc.) to progress matters for the Senate Inquiry, and to ensure that duplication of effort is avoided.

Appendix 1

Forum Attendees

ATTENDEES - POST HARVEST GRAIN TECHNICAL FORUM

Name	Company
Dr Amanda Able	University of Adelaide – School of Agriculture, Food & Wine
Vaughan Chenoweth	Ridley AgriProducts Pty Ltd
Deane Crabb	South Australian Farmers Federation
Jenny Davidson	South Australian Research & Development Institute
Colin Edmondson	Longreach Plant Breeders
Assoc Prof Jason Englinton	University of Adelaide – School of Agriculture, Food & Wine
David Evans	Australian Grain Accumulations
Sean Flanery	Grain Trade Australia
Gary Flohr	South Australian Farmers Federation – Grain Industry Committee
Tina Grech	Lienert Australia Pty Ltd
Trevor Hammond	Adviser to Adrian Pederick MP JP
Andrew Hannon	Viterra Ltd
Wayne Hawthorne	Pulse Australia
Dr Bertus Jacobs	Longreach Plant Breeders
Steve Jefferies	Australian Grain Technologies Pty Ltd
Richard Konzag	Grains Research & Development Corporation – Southern Panel
Peter Kuhlmann	South Australian Grain Industry Trust
Mark Laucke	Flour Millers Council
Dion Le Brun	South Australian Farmers Federation – Grain Industry Committee
Dave Lewis	Primary Industries and Research South Australia
David Malpas	South Australian Farmers Federation – Grain Industry Committee
Assoc Prof Daryl Mares	University of Adelaide – School of Agriculture, Food & Wine
Geoff Masters	AG Horizons Cargill Australia
Gerard McMullen	GP McMullen Consulting
Larn McMurray	South Australian Research & Development Institute
Prof Pauline Mooney	South Australian Research & Development Institute
Hon Michael O'Brien	Minister for Agriculture, Food & Fisheries
Samantha Openshaw	FOSS
Adrian Pederick MP JP	Shadow Minister for Agriculture, Food & Fisheries
Andrew Pointon	South Australian Research & Development Institute
Dr Rohan Rainbow	Grains Research & Development Corporation
Adrian Reginato	AWB Ltd
Caroline Rhodes	Viterra Ltd
Rosemary Richards	Australian Grain Exporters Association
Michael Schaefer	South Australian Farmers Federation – Grain Industry Committee
Mark Schilling	AG Schilling & Co.
Peter Semmler	Agrisemm Global Brokerage
David Shannon	Grains Research & Development – Southern Panel
Jamie Smith	South Australian Farmers Federation – Grain Industry Committee
Michael Southan	Grain Growers (ex. Bread Research Institute)

Name	Company
Doug Stewart	Viterra Ltd
Ron Storey	Storey Marketing
Geoff Thomas	Thomas Project Services
Dr Ben Thomas	Ben Thomas Consulting
Andrew Vroland	Viterra Ltd
Dr Hugh Wallwork	South Australian Research & Development Institute
Rob Wheeler	South Australian Research & Development Institute
Peter White	South Australian Farmers Federation
Philip Wilsdon	South Australian Farmers Federation Grain Industry Committee
Andrew Wilsdon	Glencore Grain Pty Ltd

Appendix 2

Viterra

Post Harvest Review – Terms of Reference

Post-harvest review

Overview

Viterra will conduct a post-harvest review (the Review) following the completion of the 2010/11 harvest in South Australia, in order to support its ongoing commitment to listen, respond to feedback and implement new initiatives to benefit growers.

The Review will go beyond an internal assessment of harvest operations in 2010/11. The process will be led by a working group established to consider harvest performance issues and identify ways to enhance service delivery to growers.

Membership of the Working Group will include an independent expert, the Hon Rob Kerin, and representatives of Primary Industries and Resources, South Australia (PIRSA) and the South Australian Farmers' Federation (SAFF). Viterra will provide all secretariat services to assist this work.

The Working Group will be required to consult widely and undertake a thorough examination of the issues raised by stakeholders, in formulating its series of recommendations, which will be made public.

The Working Group is required to commence its Review by 22 February 2011 and report to Viterra by 31 May 2011. All recommendations formulated by the Working Group will be published by Viterra, including details of its response no later than 30 June 2011.

Context

This Review will assess Viterra's South Australian operations in the context of the state's grain harvest in 2010/11, exploring the impact of widespread rain in early December and record volumes of production.

Scope

A Working Group has been appointed by Viterra to manage the Review and is responsible for:

- Reviewing Viterra's operations in connection to the South Australian grain harvest in 2010/11
- Consulting widely with growers and other key stakeholders, to learn from the collective experience of the grains industry during the 2010/11 grain harvest
- Formulating recommendations to improve Viterra's service delivery, communication and methods of consultation with growers and stakeholders in the future.
- Considering industry-wide recommendations if appropriate

Terms of reference

The Working Group will give consideration to issues that influence the efficient operation of Viterra's South Australian grain handling and storage network, including but not limited to:

1. Communication to growers and carriers during and prior to harvest.
2. Information provision for the benefit of growers, including warehouse and quality data disclosure during 2010/11.
3. Available storage capacity, including the number of segregations made available during harvest.
4. Grain classification, including sampling, assessment techniques (visual and objective), standards and classifier training.
5. Site opening hours and service delivery to growers and carriers.

6. Awareness of on-site safety procedures and protocols for all visitors to Viterra sites.

7. Harvest forecasting.

8. Any other factors that may have impacted upon service delivery to growers during 2010/11 harvest.

Consultation

In conducting its Review, the working group will consult widely with key industry stakeholders, including growers and their representative groups, industry bodies, companies and government agencies.

It is anticipated that Viterra's regional network of silo committee chairs will contribute local knowledge and experience into this process, ensuring the Working Group gains a thorough understanding of harvest operations across the state.

Individual growers will have the opportunity to provide input directly to the review through responding to a Grower Questionnaire. This document will be distributed to all South Australian growers.

Written submissions

The Working Group will accept written submissions from interested stakeholders which address the terms of reference outlined on this page.

Submission should address some or all of the terms of reference and may include:

- facts
- opinions
- arguments
- recommendations for action

Email: harvestreview@viterra.com

Mail: Viterra Post-Harvest Review

PO Box 1169

ADELAIDE SA 5001

For further information, please contact the Service Centre on  1800 018 205 .

Appendix 3

Parliament of South Australia

Select Committee on the Grain Handling Industry – Terms of Reference



SELECT COMMITTEE ON THE GRAIN HANDLING INDUSTRY

TERMS OF REFERENCE

That the Select Committee investigate the Grain Handling Industry, in particular –

- (a) the capacity of the market to ensure a vigorous and competitive marketplace for grain growers;
- (b) grain classification and standards, and whether internationally approved grain testing options should be available to growers on request;
- (c) service delivery, including human resources, operating hours and storage capacity of grain handling points;
- (d) export and shipping arrangements, including port access and associated costs;
- (e) grain quality management, including receiving and out-turn;
- (f) open and transparent information on all grains, including stock disclosures;
- (g) adequacy of road and transport infrastructure for the Grain Industry; and
- (h) any other related matter.

That the Committee have power to send for persons, papers and records and to adjourn from place to place and to report on 14 September 2011.

That Standing Order 339 be and remain so far suspended as to enable the Select Committee on the Grain Handling Industry to authorise the disclosure or publication, as it thinks fit, of any evidence presented to the Committee prior to such evidence being reported to the House.

(Extract from Votes and Proceedings, House of Assembly 9 March 2011)

Appendix 4

Senate Standing Committees on Rural Affairs and Transport

Operational issues in export grain networks – Terms of Reference



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Operational issues in export grain networks

Terms of Reference

Operational issues arising in the export grain storage, transport, handling and shipping network, with particular reference to:

- (a) any risks of natural, virtual or other monopolies discouraging or impeding competition in the export grain storage, transport, handling and shipping network, and any implications for open and fair access to essential grains infrastructure;
- (b) the degree of transparency in storage and handling of grain and the appropriateness of any consequent marketing advantages;
- (c) equitable access to the lowest cost route to market, including transport options;
- (d) competition issues arising from the redelivery of grain;
- (e) the absence of uniform receipt, testing and classification standards and practices and any implications for growers and/or for Australia's reputation as a quality supplier;
- (f) equitable and efficient access to the shipping stem; and
- (g) any other related matters.

For further information, contact:

Committee Secretary
Senate Standing Committees on Rural Affairs and Transport
PO Box 6100
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