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## **On farm grain storage – potential opportunity or risk- meeting the demands of food safety and quality, an Australian perspective**

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### **Abstract**

Traceability, product identity, food safety and quality assurance are increasingly required by end users and customers. The Australian on farm storage system has a unique opportunity to deliver grain to meet these requirements, provided the system is set up and managed to ensure the end product meets the market requirement.

Australian grain growers are becoming more aware of the changing nature of markets and their requirements, and the importance of managing storage to meet food safety requirements. With the increasing change in storage dynamics in Australia from a central receival system to a range of storage entities, of which on farm storage is becoming a major player, there is a growing need for the grains industry to ensure all who can affect grain quality and food safety are aware of and can meet their obligations.

There are many challenges for Australian growers to manage; including managing existing facilities, investing in new facilities, managing insects, managing grain quality and ensuring treatments are used in accordance with best practice. Despite these challenges, there are many opportunities and potential for the on-farm storage system to meet the demands required of them to deliver a quality and food safe product to the end-user.

This paper discusses the on-farm grain storage system, management of and the opportunity and risks for growers and end users to work together to ensure a quality and food safe product is delivered to the end-user.

Traceability, product identity, food safety and quality assurance are increasingly required by end users and customers. The on farm storage system has a unique opportunity to deliver grain to meet these requirements, provided the system is set up and managed to do this in collaboration with the end user and market.

Whilst grain growers are aware of the changing nature of markets and their requirements, it is fair to say food safety and how they might affect this is relatively new in their thinking. With the increasing change in storage dynamics from a central receival system to a range of storage entities, of which on farm storage is becoming a major player, there is a growing need for the grains industry to ensure all who can affect grain quality and food safety are aware of and can meet their obligations.

There are many challenges for growers to manage; including managing existing facilities, investing in new facilities, managing insects, managing grain quality and ensuring treatments are used in accordance with best practice.

Despite these challenges, there are many opportunities and potential for the on-farm storage system to meet the demands required of them to deliver a quality and food safe product to the enduser and customer.

This paper discusses the on-farm grain storage system, management of the system and the opportunity and risks for growers and end users to work together to ensure a quality and food safe product is delivered to the enduser and customer.

### **Introduction**

With the increase in on-farm grain storage there has been a corresponding increase as to the impact it has on the supply chain. Traceability, food safety, product identity, biosecurity and quality assurance are required to differing extents by industry and the market place. Australia has long had a reputation for providing "clean and green" agricultural products, however there is an increasing demand from both domestic and international markets to prove that food products are safe, and the term food safety is increasingly common when describing market requirements.

Both the domestic and export grain markets continually change, however the need for suppliers to be customer focussed and respond to and manage changes in the market place, places the on-farm grain storage system in a unique position to meet and capitalise on these requirements. There is no question that grain growers are investing in their storage systems and have a unique opportunity

to put in place and improve their existing system to meet the current and future requirements of the supply chain and market.

The on-farm storage system can be developed into one which can manage product identity, quality, traceability, food safety and changing market demands, giving growers flexibility and choices in how they market and deliver their grain through the supply chain. Whilst some may view this as a negative, the growth in on-farm storage continues and can store and deliver grain precisely as the market needs.

The types of systems invested in give growers the ability to segment and manage grain in storage to provide a quality product to the market. Certainly the on-farm system needs to ensure it implements best practise and invest in technologies and training to support best practice, however there are many examples where growers are doing this and many more are seeing the examples of this and considering their own business opportunities.

The grains industry has developed a number of codes of practise as guidelines for Good Agricultural Practice (GAP), and has developed a QA program based on food safety principles using the internationally recognised HACCP (Hazard Analysis Critical Control Point) system. Graincare (the grains industry developed QA system) is well positioned as a HACCP based quality assurance program to deliver a food safe assured product to the market.

There are many potential opportunities and risks when sourcing grain from the on-farm system, however ensuring that the market and the supplier are clear about their needs and responsibilities and establish beneficial outcomes for both, the on-farm market is well placed to provide a quality, safe food product for the enduser.

### **The on-farm storage system**

Traditionally the on-farm storage system was based around smaller silos up to 70 tonne capacity, sheds and in some areas ground storage such as pads and bunkers. In the past 10 years the size of silos has increased substantially, and there has been a trend to larger flat bottom style silos ranging in capacity from 500 – 5000tonnes capacity. The use of temporary systems such as silo bags has increased significantly, and are usually used as a short term option.

Grain in unsealed storage is typically treated with a contact grain pesticide treatment to protect the grain whilst in storage. Resistance to commonly used grain protectants has meant growers are looking for alternatives to control resistant insect pests.

In 2014 the only registered spray treatment to kill insects was taken off the market, currently the only way to kill an infestation is by fumigation. This is forcing growers to seriously consider their investment strategy in new systems because fumigation can only work properly in a sealed gas-tight structure.

With the deregulation of the export market growers storing grain became more aware of the PRF (pesticide residue free) requirement of the export market. Growers have also seen this transfer into domestic markets where they are increasingly being asked for grain to be stored without being treated with contact pesticide protectant treatments. This has meant growers have had to invest in gas-tight sealable storages to effectively fumigate grain to kill insects. There has been a significant increase in the investment in sealable storage, and in 2010 an Australian standard (AS 2628) for gas-tight sealable storage was gazetted providing growers with a benchmark for purchasing gas-tight sealable silos.

In Western Australia grain storage protectants are not registered for grain treatment in on farm storage. Growers are only permitted to fumigate grain, as such, sealed storage has been widely used in on-farm storage for over 30 years

Best practice when storing grain requires growers to implement an integrated approach, using physical and chemical interventions to manage quality and control insects. Over the past 20 years there have been significant changes in the storage types, design and ways growers have applied an

integrated approach. Implementing good grain and system hygiene ensures insect numbers are limited, understanding insect species and their ecology assists in managing pests, and using chemical treatments and fumigants correctly ensures insects can be controlled when needed. Cooling grain using ambient aeration systems has increased in the past 10 years and is gaining widespread acceptance as a way of managing insects and quality by reducing grain storage temperatures.

Growers are increasingly becoming aware of the need to understand the quality of their grain, particularly to ensure grain out turned from their system meets market specifications. One of the advantages of on-farm storage is the ability to segregate grain more readily by using a combination of small, medium and larger storages.

Provided growers are willing to invest in a system which meets market requirements, they are in a unique position to provide a package which delivers product identity, traceability, can meet the needs of food safety requirements and best practise. There is no question that the on-farm storage system can build on and become a larger component of the supply chain, providing confidence and integrity to the market

### **Food Safety – Can on-farm storage meet this requirement?**

The on-farm storage system is well placed to demonstrate that the product stored is safe for consumption. The grains industry has produced a number of codes and guidelines for growers and industry to enable this. "Growing Australian Grain – Safely Managing Risks with Crop Inputs and Grain On-farm" is a guide for growers and advisors to help manage risks with inputs, grain handling and safety on farm.

Grain Trade Australia has produced in collaboration with industry the Australian Grain Industry Code of Practice for the post harvest/post farm sector. Both of these documents enable growers to begin the journey to manage the risks associated with grain production and storage. The grains industry has also developed GrainCare which is a HACCP based quality assurance system which directly enables the grower to demonstrate they meet food safety requirements and are independently audited and assessed.

With the development of a modern, fit for purpose on-farm storage system, which can manage quality, identity preservation, outturn and food safety risks, there is a growing opportunity for the supply chain and market to access grain post farm gate with the confidence that supply chain integrity is maintained.

### **Conclusion**

There is no doubt that the on-farm grain storage system is an integral and growing part of the supply chain. Growers need to ensure they understand their role in the supply chain, and invest in technologies, systems and training which enable them to implement best practise in their grain storage system.

Ensuring that the integrity of the supply chain is maintained requires all parties to do their part and give feedback to all stakeholders. Growers can and will respond to the needs of their market, providing a product which can provide traceability, product identity and assure the product meets food safety requirements. Managed correctly, the on-farm storage system can be a growing opportunity for markets to access quality products direct from the grower, minimising the risk to the end user and supply chain.

### **Strengthening national food safety for improved food security in Nigeria**

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