Grain aeration – a viable option

Key points

- On-farm aeration systems reduce grain moisture and allow earlier harvesting at higher moisture levels.
- There are advantages in harvesting at higher moisture levels provided the grain can be safely stored.
- Maintaining grain in good condition while in storage is an essential part of grain production.
- The biggest risk to storing grain is a combination of high moisture and high temperature.

Harvesting at higher moisture levels

The problems and frustrations caused by cool, wet weather during harvest have been highlighted again this year. The aim is to get the crop off and into safe storage as quickly as possible without delays at harvesting which can put the crop at risk. As an industry we should pay as much attention to grain quality after harvest, as we do to producing good quality grain before harvest.

There are advantages to be gained from harvesting at higher moisture levels provided the grain can be safely stored, normally using some form of aeration to dry and cool the grain. Pulses have been able to be delivered at up to 14% moisture for several seasons at receival sites where aerated storage facilities are available.

Being able to deliver or store grain on farm at a higher moisture content allows harvesting to start earlier in the season, and earlier and longer each day. This is especially important in some coastal districts where periodic higher humidity can limit daily harvest time which can significantly reduce the risk of weather damaged grain.

Earlier harvesting increases operating time equivalent to an increase in harvesting capacity. If the cost of harvesting capacity significantly exceeds the cost of aeration, then earlier harvesting at higher moisture levels combined with aeration could be a cheap alternative to the purchase of large capacity harvesters.

Grain quality in storage

Most grain qualities decline while grain is in storage; eg seed viability, malting for barley, milling and baking for wheat, oil composition of oilseeds and colour of pulses. In addition there are risks of insect and fungal damage.

The biggest risk to storing grain is a combination of high moisture and high temperature. Weevils can grow rapidly at high moistures and temperatures, releasing heat and moisture which further raises the temperature and moisture levels. Moulds develop at a fast rate if grain temperature is high, but the key factor is grain moisture content.

Safe moisture content for longer term, unaerated storage of wheat is about 12% or less. Critical moisture levels for mould growth can occur at increments as small as 0.5% making accurate and dependable moisture measurement very important.

Grain aeration

In SA there are a small but increasing number of growers who have installed aeration systems on farm to handle at least some of their harvest capacity. These systems normally use ambient air blown in and upwards through the grain, taking moisture and heat with it. The extent of grain drying and cooling will depend on the temperature and humidity of the incoming air. Automatic controllers are available to select only the coldest conditions when cooling and the warmest conditions when drying.

While a few growers have built their own aeration systems, there are commercially available units which can be readily fitted to existing cone bottom silos. These start at about $4000 for one silo including an automatic temperature/ humidity controller.

Aeration drying facilities are suitable for grain up to 15% moisture and can reduce moisture levels by 2-3% in a relatively short time, depending on weather conditions.

Aeration is a useful tool to extend the harvesting window where the humidity is relatively low at least for part of the day, and only a portion of the total crop would normally require drying.

Workshop opportunities

Two workshops available in 2002 through PIRSA Rural Solutions which focus on aspects of grain storage and grain aeration are:

- On-Farm Grain Hygiene.
- Responsible, Safe and Effective Use of Phosphine on Farms (can include *ChemCert* re-accreditation).

Further information

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