Sealed silos — take the pressure test

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Photo:s Chris Warrick

Under pressure: *Sealable silos must be pressure tested to confirm they are gas tight in order for fumigation to be successful.* **INSET:** *A new Australian Standard (AS2628) provides a benchmark for sealed storage.*

As harvest draws near it's time to ensure all equipment is up to scratch and ready to go. *Farming Ahead's* Research Officer, Chris Warrick provides some timely tips on how to ensure your sealable silos are gas tight, for effective insect control.

At a glance

- A new Australian Standard (AS2628) provides an industry benchmark for pressure testing sealable, gas-tight silos.
- Any silo sold as a 'sealed silo' still needs to be pressure tested to ensure it is gas tight.
- Carry out a five-minute half-life pressure test upon silo erection, each year before harvest and before every grain fumigation.
- Regular maintenance is the key to ensuring a sealable silo remains gas tight.

Secure grain storage is the key to a timely and efficient harvest and the maintenance of grain quality until delivery to a buyer.

Sealable, gas-tight silos provide the ultimate grain protection, but only if they are truly up to the job.

A new benchmark for sealing grain silos has been developed to boost the effectiveness of grain storage pest control.

Standards body SAI Global recently published an Australian standard for gas-tight sealed silos in response to industry concerns that phosphine fumigation in improperly sealed storages was not killing off the full life cycle of pests.

This has seen a growing resistance to phosphine during the past 10 years with many grain silos failing to meet gas-tight standards required for effective fumigation.

Resistance to phosphine in target insect pests has increased in frequency and strength such that it now threatens effective control.

The standard is based on a new silo meeting a five-minute half-life pressure test. When a pressure test is carried out, oil levels in the pressure relief valve must take a minimum of five minutes to fall from a 25 millimetre difference to a 12.5mm difference if the silo is sufficiently gas tight.

The new standard provides an industry benchmark for grain growers, boosting their confidence when investing in a new silo. A successful pressure test ensures the silo will perform in the manner it is intended to — a gas-tight chamber that holds a lethal concentration of gas fumigant for the time specified on the label.

Taking the test

Growers must ensure they maintain sealable, gas-tight silos and pressure test them before each fumigation. Only regular maintenance and testing will ensure a silo can perform as an effective fumigation chamber.

Where regular maintenance is undertaken to keep seals in order, pressure testing is a fast and simple process.

Timely testing — The best time to pressure test is within an hour of sunrise or on a cool overcast day, when the ambient temperature is stable and the sun is not heating the silo (and the air inside, causing it to expand and potentially give false test results).

Check seals — before testing, check the seals around the silo lid, access hatch, hopper or boot and aeration fan are in sound condition. Fasten and lock down all lid latches.

Check oil levels — Some older sealable silos may not have a gauge on the oil relief valve — use a marker pen to show start and finish levels. Before pressurising the silo check the oil levels are equal on both sides

Likely leaks

Common places for leaks in sealable silos include:

- Bottom outlet
- Aeration inlet seal
- Damaged lids
- Stretched springs on latches
- Between the bottom cone or base and the silo wall joint
- The roof and wall joint and where the lid ring joins the roof

of the gauge and are at the middle indicator mark.

Under pressure — If fitted with an aeration fan, pressurise the silo by turning on the fan for a few seconds, then sealing the fan inlet. Stop the fan and close off the fan inlet as soon as the oil levels are further than 25 millimetres apart, or the oil is bubbling. Be mindful — there is potential for damage if fans are left running for extended periods while the silo is sealed or the inlet is blocked off.

Having a second person to help makes the job easier.

Air valve — If the silo does not have an aeration fan, install a tubeless tire valve to pressurise the silo with an air compressor. Screw the centre out of the valve to get more air-flow into the silo. For larger silos, or small air compressors, install a PVC male fitting that can connect to a venturi gun (Blow/vac) on the end of the air line.

Half-life test — Ensure the oil levels are 25mm apart before starting the timer.

The time taken for oil to drop from 25mm apart to 12mm apart must be no less than five minutes on new silos. Three minutes is sufficient for older silos.

Looking for leaks — If the time taken for the oil levels to drop to 12mm is less than that required (five minutes on new silos and three on older silos), there is a leak. To isolate leaks pressurise the silo again and use soapy water in a spray bottle to check for leaks around seals. For older, poorly designed silos, gentle pressure from a jack may assist the seal on the slide-plate outlet.

When the leak has been found and fixed, carry out the pressure test again. FA

Photos: Chris Warrick

Adequate relief: *Large flat bottom silos require two oil relief valves to allow air inside the silo to expand and contract with temperature change.*

Middle level: *Insure oil levels are at the middle indicator mark before starting a pressure test (pictured on left).*

Half life: *The time taken for oil to drop from 25mm apart to 12mm apart (pictured on right) must be no less than five minutes on new silos.*

Finding leaks: *To isolate leaks pressurise the silo again and use soapy water in a spray bottle to check for leaks around seals.*

FURTHER READING ▶

Research Report: Grain Storage *Group Talk*, August 2010 No.6.

Research Report: Keeping aeration under control *Farming Ahead*, March 2010, No. 218.

Research Report: Unearthing savvy storage secrets *Farming Ahead*, August 2009, No. 211.

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