Berufsbildung für nachhaltige Entwicklung in der internationalen Berufsbildungszusammenarbeit

Nachhaltigkeit in der Müllerei, national und international

15. November 2022

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Nachhaltigkeit - Energie
Einsparungsmöglichkeiten in der Mühle

Bildquelle: Bundesmühlenkontor GmbH/Steffen Höft

Spezifischer Energieverbrauch einer Getreidemühle
60 -75 kWh/t

- Mechanischer vs. pneumatischer Transport
- Effiziente Motoren
- Einsatz Frequenzumformer
- Intelligente Prozesse
- Einsatz von Wasserkraft

Nachhaltigkeit – Soziale Aspekte

Bildquelle: Bundesmühlenkontor GmbH/Steffen Höft

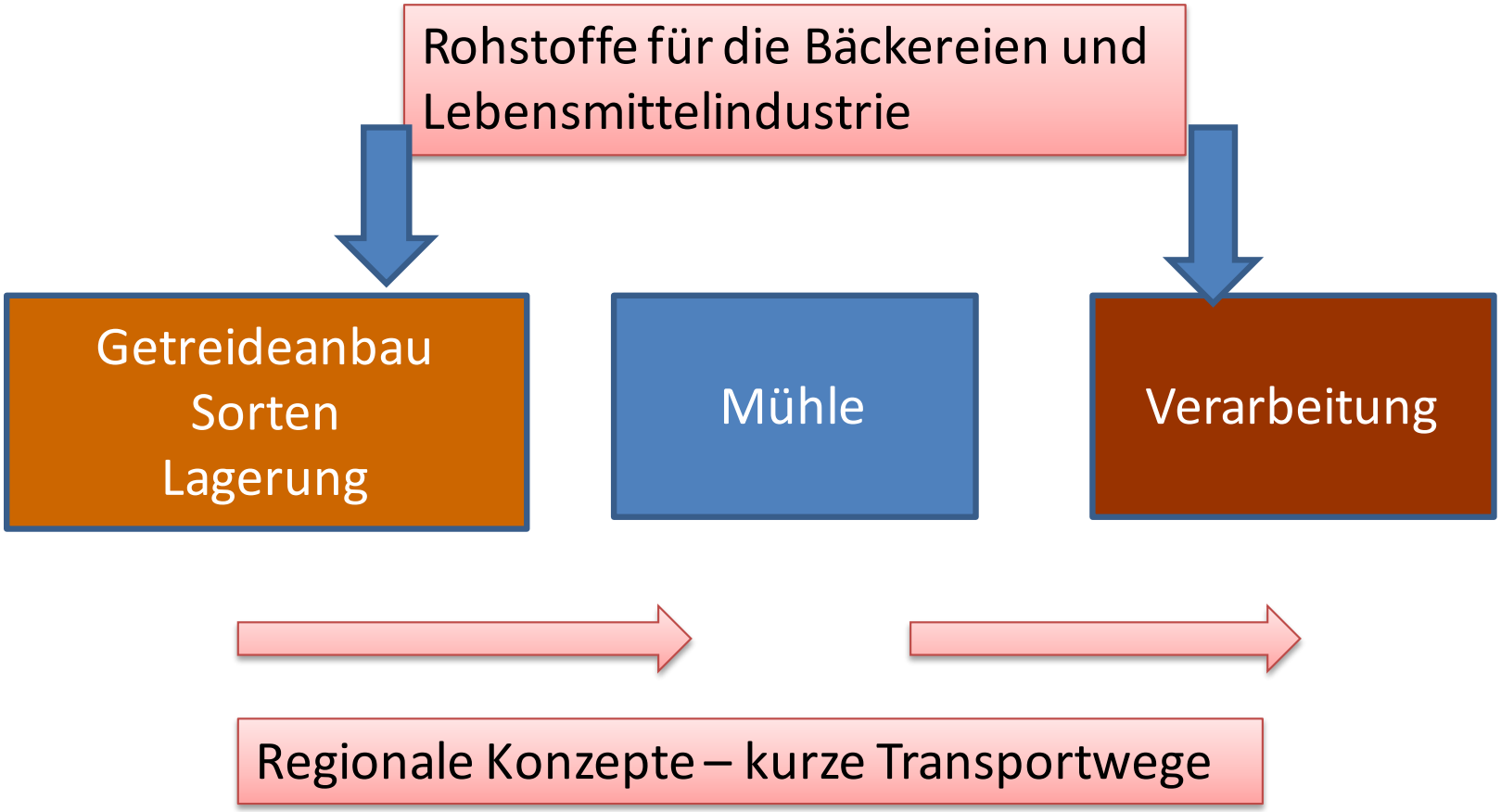
- Ukrainekrise und Getreideversorgung
- Erneuerbare Energien und Ernährungssicherheit
- Umgang mit Mitarbeitern
- Arbeitssicherheit und Gesundheitsschutz

Nachhaltigkeit - Ökologisch

Bildquelle: Bundesmühlenkontor GmbH/Steffen Höft

- Ausbau von Bioprodukten
- Regionaler Anbau von Getreide
- Verminderung von Verderb bei der Lagerung von Getreide
- Intelligente Belüftungssysteme

Nachhaltigkeit in der Wertschöpfungskette Getreide – Mehl - Backwaren



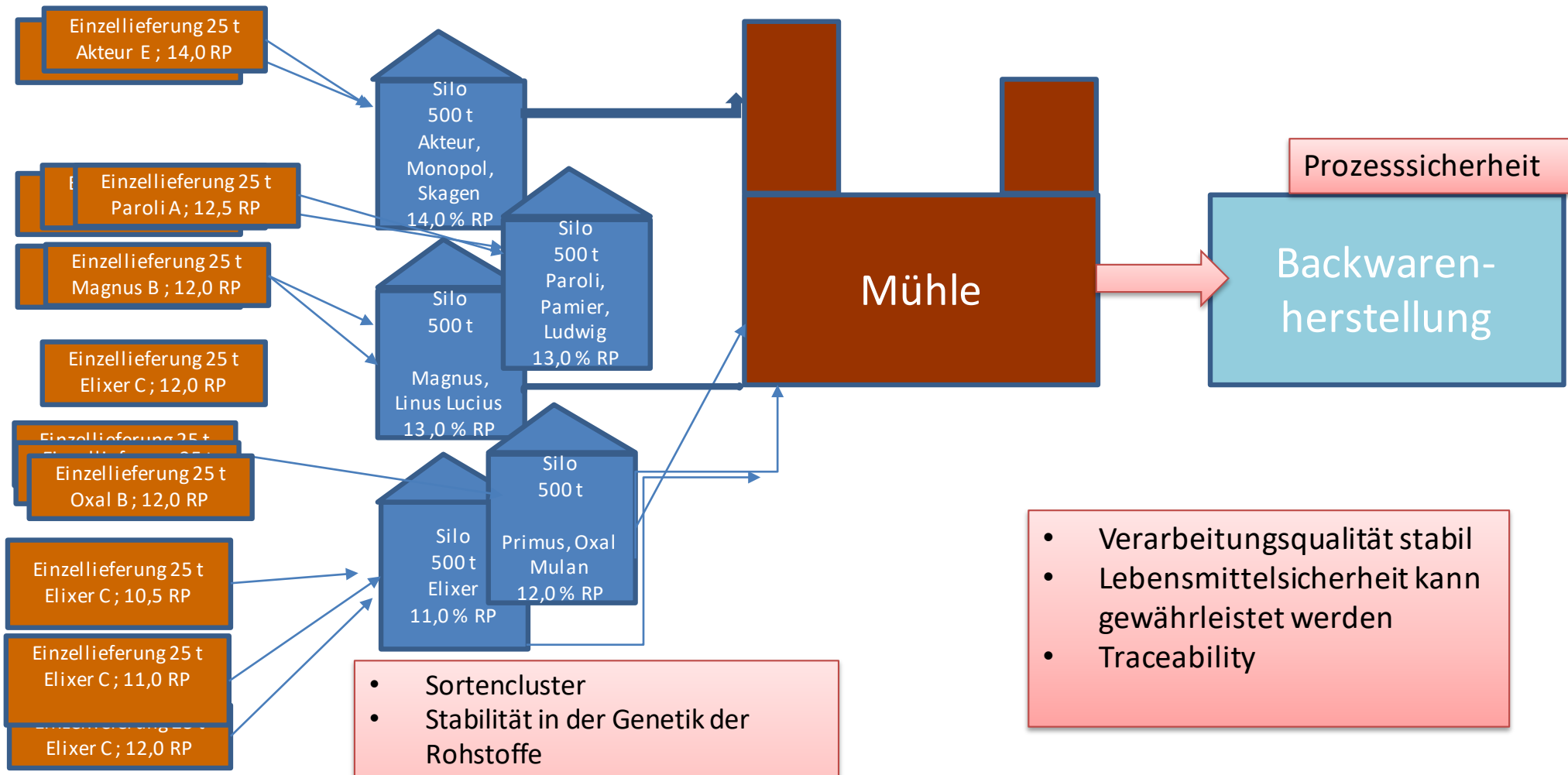
Nachhaltigkeit durch Minimierung von Düngemitteln und Pflanzenschutzmitteln

- Zu viel Nitrat im Grundwasser führt zu immer strengeren Düngemittelverordnungen
- Dies führt zu weniger Rohprotein im Getreide
- Dies führt zu veränderten Backergebnissen (weniger Volumen)
- Müller müssen technologisch reagieren
- Proteinqualität ist sortenabhängig

Lösungsansätze:

- Sorteninformation nicht verlieren
  - Viele kleinere Siloeinheiten
  - Bildung von Sortenclustern (passende Backeigenschaften zusammen)
- Datenlieferungen der Landwirte (Bodenbearbeitung, Düngung, Pflanzenschutz, Sorte) über die Cloud an den Kunden

Nachhaltige Rohstoffversorgung bei reduziertem Düngemitteleinsatz



- Sortencluster
- Stabilität in der Genetik der Rohstoffe
- Sämtliche Informationen zu Boden, Düngung, Pflanzenschutz vorhanden

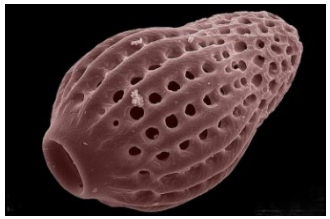
- Verarbeitungsqualität stabil
- Lebensmittelsicherheit kann gewährleistet werden
- Traceability

Nachhaltigkeit - International
Brasilien

Cooperativa Agrária

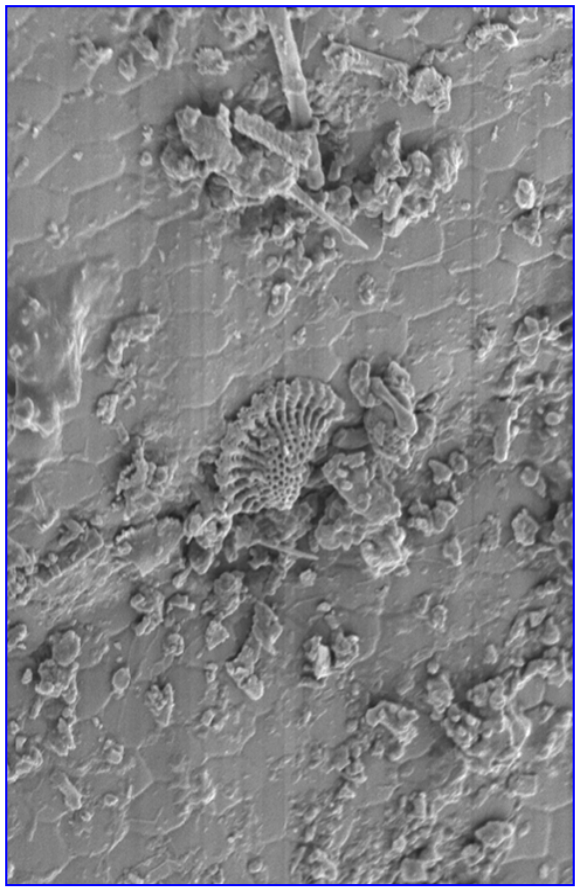
Pinhão - PR

Quelle: Christos G. Athanassiou



Mode of action of DEs against insects

Quelle: Christos G. Athanassiou



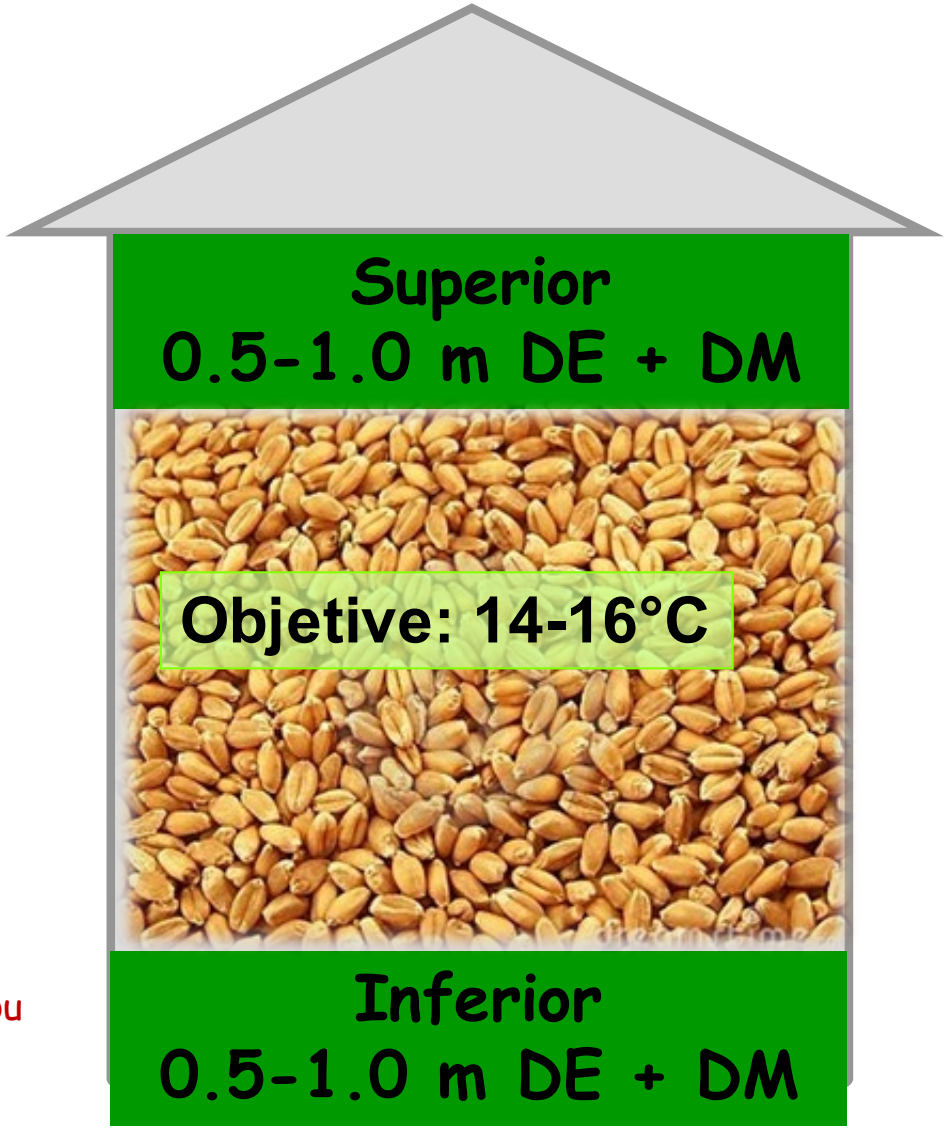
Step 1:
DE is admixed with the product

Step 2:
DE particles stick in the cuticle

Step 3:
Cuticle (waterproof) lipids are absorbed

Step 4:
Insects die through water loss

"Envelop" in the grain mass (= DE + DM at the top and the bottom)



Quelle: Christos G. Athanassiou

Nachhaltigkeit bei der Bekämpfung von Insekten

Behandlung der leeren und sauberen Silos

PHOTO: CHRIS WARRICK, PROGAMAGE

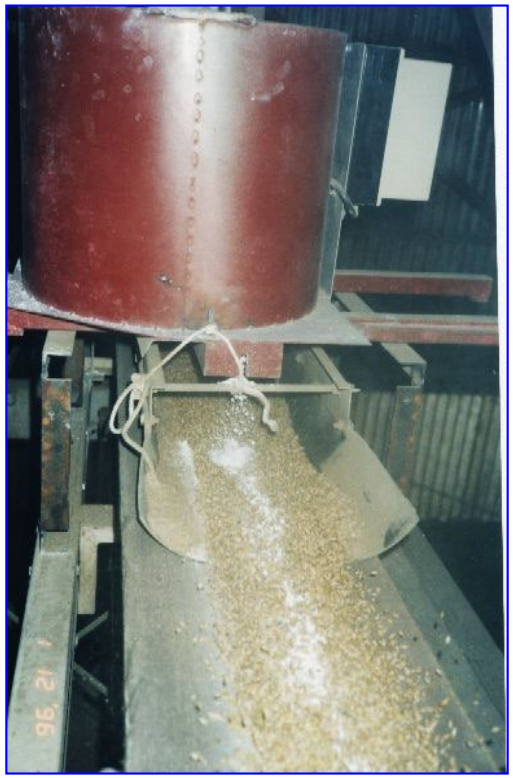
Dust up: *Apply diatomaceous earth aiming for an even coat on the roof, walls and base.*

TABLE 1 INERT DUST (DE) APPLICATION GUIDE

STORAGE CAPACITY (T)	DUST QUANTITY (KG)
20	0.12
56	0.25
112	0.42
224	0.6
450	1
900	1.7
1800	2.6

PHOTO: CHRIS WARRICK, KINGDOM GROUP

Ready, aim, fire: *A Blovac or air venturi gun is the best applicator for diatomaceous earth dust.*



Achtung!
Böschungswinkel erhöht sich um 5-10°

Quelle: Christos G. Athanassiou

Zugabe von DE im Getreidestrom

Internationale Zusammenarbeit in der Ausbildung mit Australien

photographed and pressure tested according to Australian Standards.

Silo selection requires research

Since deregulation, there has been a growing trend to store an increasing amount of grain on farm. But maintaining the quality of grain in storage requires planning, knowledge and the right gear, none more important than the silo itself. Kondinin Group engineer, Ben White, travelled 8,000km across every mainland state to inspect nearly 60 silos on-farm from different manufacturers, taking photographs and undertaking a pressure test according to Australian Standards where applicable. By **Ben White**

WHY SEAL SILOS?

Contrary to popular belief, silos do not seal to physically keep insects out. Sealing a

constructed brands of silos are imported from North America where sealing is not required thanks to their freezing winter

AUSTRALIAN STANDARD 2628

AS2628-2010 was established to provide a minimum standard of sealing required to

AUGUST 2012

Performance testing aeration systems

Aerating grain in storage creates cool, uniform moisture conditions throughout the grain bulk. Cool grain temperatures slow or stop, insect pest development and maintain grain quality.

A simple device called an 'A-Flow' has been developed to measure the air-flow rate of an aeration system to check its performance.

KEY POINTS

- Aeration cooling creates cool, uniform conditions to maintain grain quality.
- An 'A-Flow' device can measure air-flow rate of an aeration system, determining its capability for cooling or drying.
- Measuring air-flow is best done when the storage is full, which creates the normal back-pressure on the fan insuring actual operating conditions for testing.

Why measure aeration air-flow

Research and commercial testing of grain aeration systems in Australia has provided recommended air-flow rates for both 'aeration cooling' and 'aeration drying.' Aeration cooling flow rates of 2–3 litres per second per tonne (L/s/t) and aeration drying air-flow rates of 15–25L/s/t provide reliable results.

Throughout the grains industry a wide range of local and imported aeration fans are in use, fitted to a large variety of grain storage types and sizes. These storages hold a range of grain types from small-seeded canola to larger cereal or pulse grains. Grain, storage and aeration fan type, along with the numerous ducting and venting designs used with aeration systems, all impact on the final working air-flow rates.

Air-flow rates well below or above recommended rates can result in the aeration system being of no benefit, wasting both the capital investment and electricity.

In some cases inappropriate air-flow rates will cause serious grain damage. Accurately measuring airflow can be achieved by following the advice outlined below.

Making an A-Flow device

The A-Flow device consists of a tube with a slot, designed to be used with a vane anemometer (Kestrel®) to measure air speed. The design and dimensions of the A-Flow device, along with the procedure to measure air-flow are critical for obtaining accurate readings. Simply placing an anemometer directly in front of the fan air intake or even in front of the A-Flow device does not provide reliable readings.

This A-Flow device is suited to test aeration fans with an air intake diameter of less than 235 mm. Large fans and a few very small fans can not be tested using this size A-Flow device.

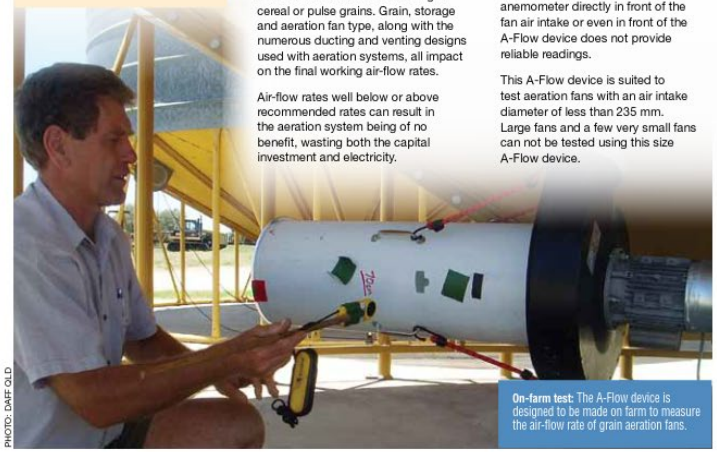


PHOTO: DAFF QLD

On-farm test: The A-Flow device is designed to be made on farm to measure the air-flow rate of grain aeration fans.

Vielen Dank für Ihre Aufmerksamkeit

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