

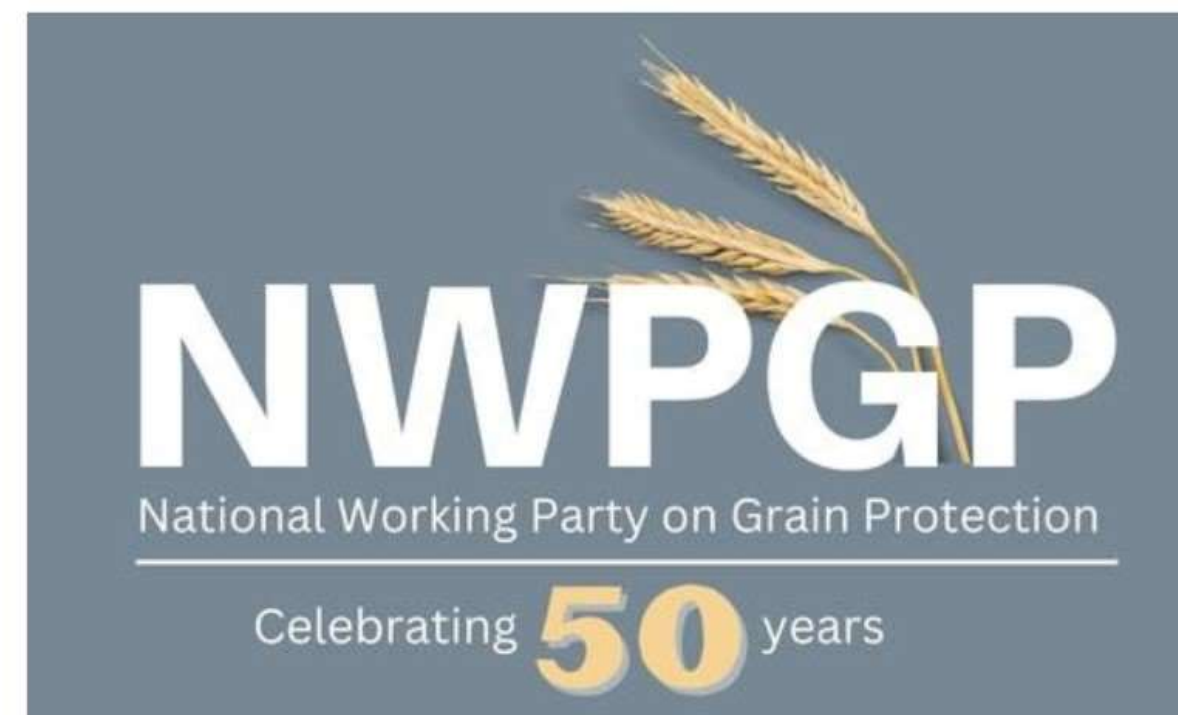


NWPGP

National Working Party on Grain Protection

Celebrating **50** years

The Australian Grain Storage and Protection Conference is convened by Grain Trade Australia and chaired by National Working Party on Grain Protection (NWPGP) which is funded by Grains Australia Limited.









It is almost certain that many of the insect pests associated with stored grain were introduced into Australia with the arrival of the first fleet in 1788.

Waterhouse 1973

But...

*Australia apparently introduced *Rhyzopertha dominica* into the USA during WW1.*

Mackie & Carter 1937





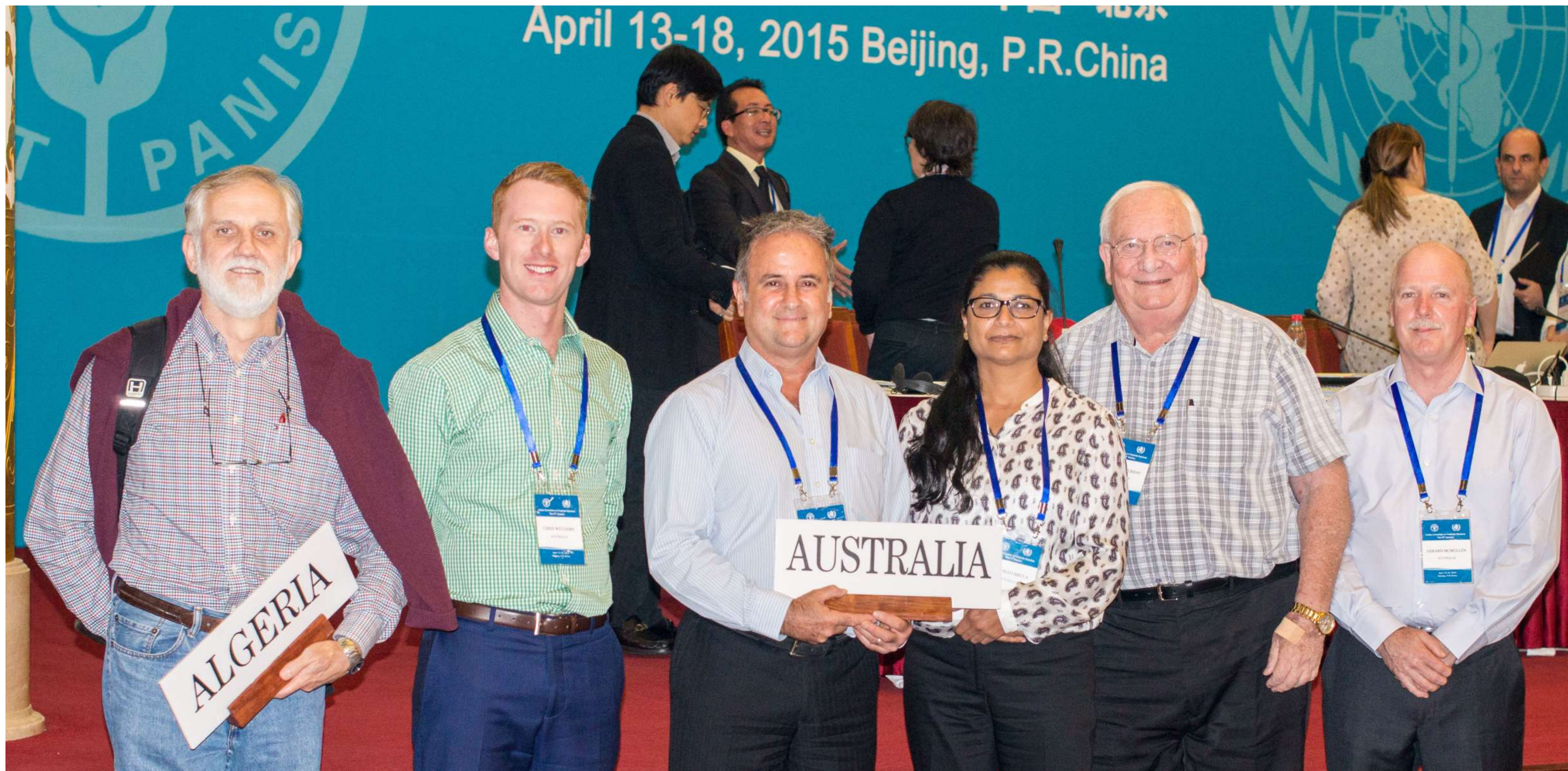


*It is very probable that grain supplies including **rice, wheat, barley and Indian corn** obtained in Cape Town in 1787 became heavily infested en route to Australia. Likewise, the grain imported during the early years of settlement from various sources, including the Cape colony and India, would have been infested in a similar manner.*

Clark 1962



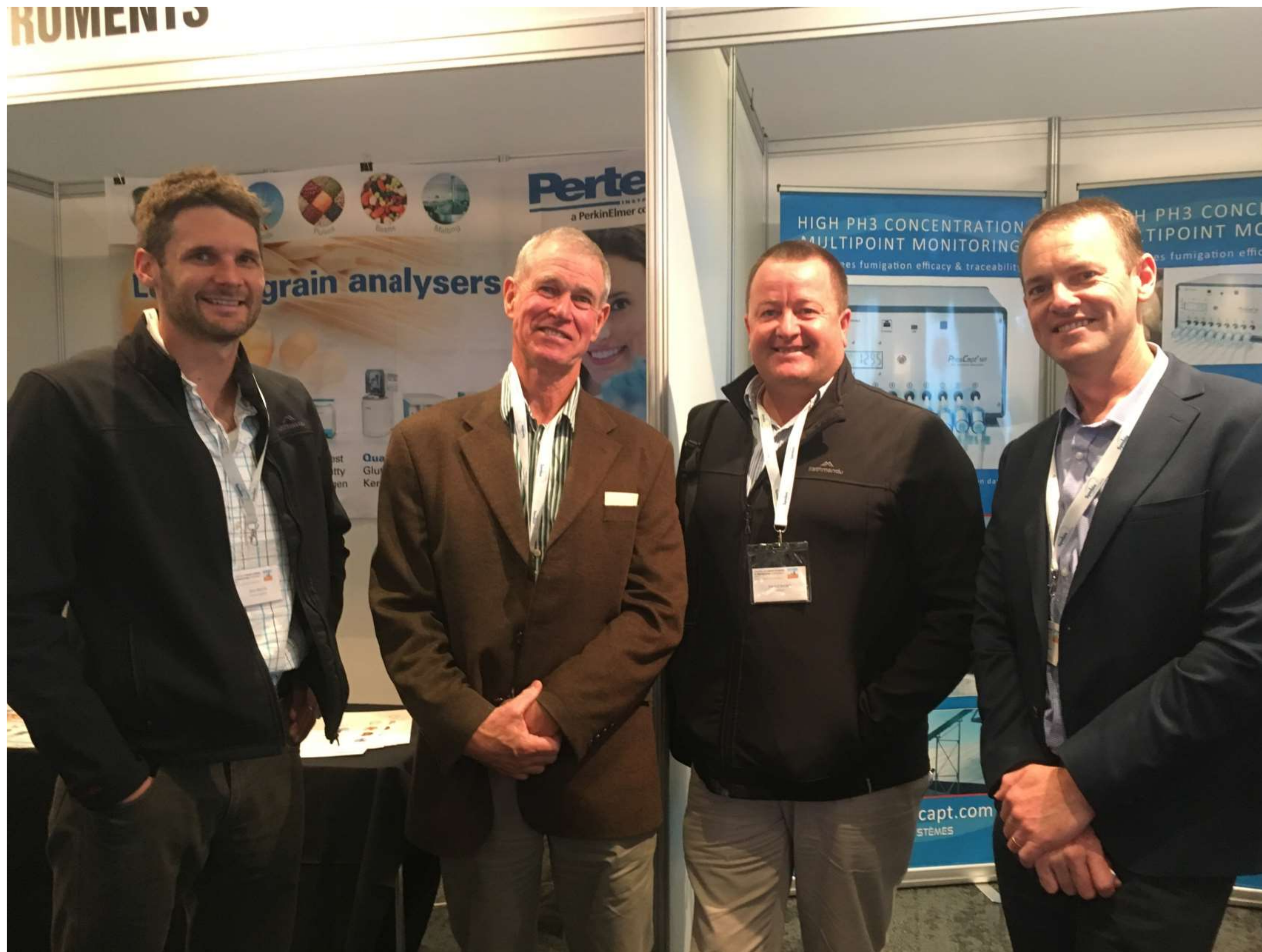




Until bulk storage was developed, grain was stored in **bags**. This bagged grain was stored in **roofed sheds** or **outdoor stack** at receival sidings, or at the port of shipment. These stacks were built on **timber dunnage**, with a **galvanised roof**.

Significant weather, insect and mouse damage occurred during various years.









In Wallaroo, Winterbottom in 1922 reported, where more than **4.5 million bags of grain** were stored:

Up to 1 ton of weevils/day were collected and destroyed

and

40 tons of wheat/day were being lost









Wheat Stacks, Brooklyn, Victoria.

During the Great War vast quantities of wheat were stacked in Victoria. This picture shows a stack of 7,000,000 bags (approximately 600,000 tons) at Brooklyn, near Melbourne.

Public Record Office Victoria, VPRS 12800 P1, H 5387

© State of Victoria

During WWII, bulk storages were being built at storage depots that were located in the **coolest, driest possible locations.**

Care was taken on no insects in received grain, but still they were present. **AWB** made storage sites be built to improved standards

and

Grain was successfully stored for up to **4 years** with minimal losses.







Until the early 1960s, insects were an **accepted part** of the storage of grain.

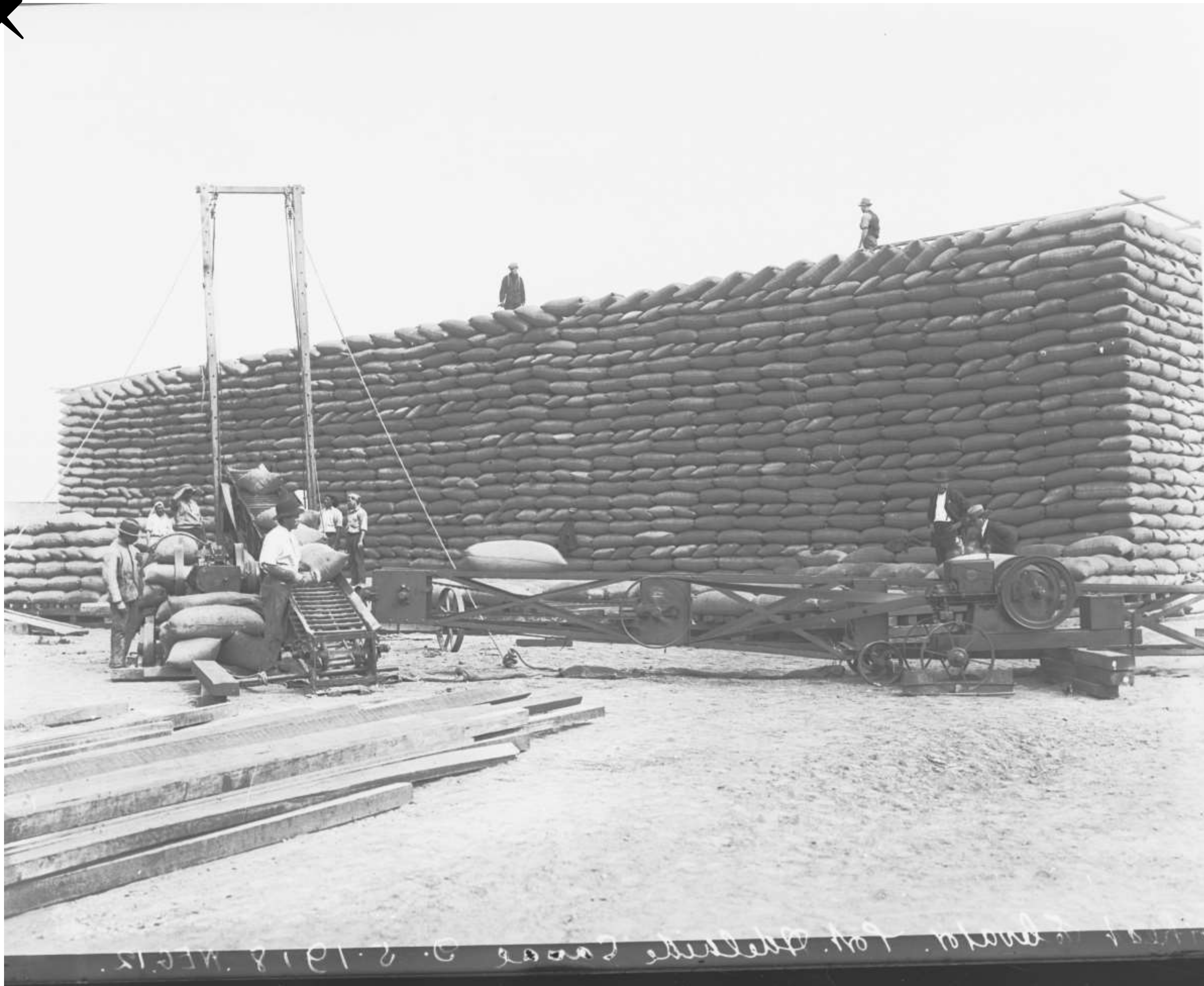
Bag stacks were still being used in the early 1960s, but bulk storages were increasingly used.











South Australia was the last State to use **bag stacks** in the 1960s, mainly because their markets couldn't handle anything other than bags.







First bulk storage silo in the country areas of NSW was built at Peak Hill in 1918.

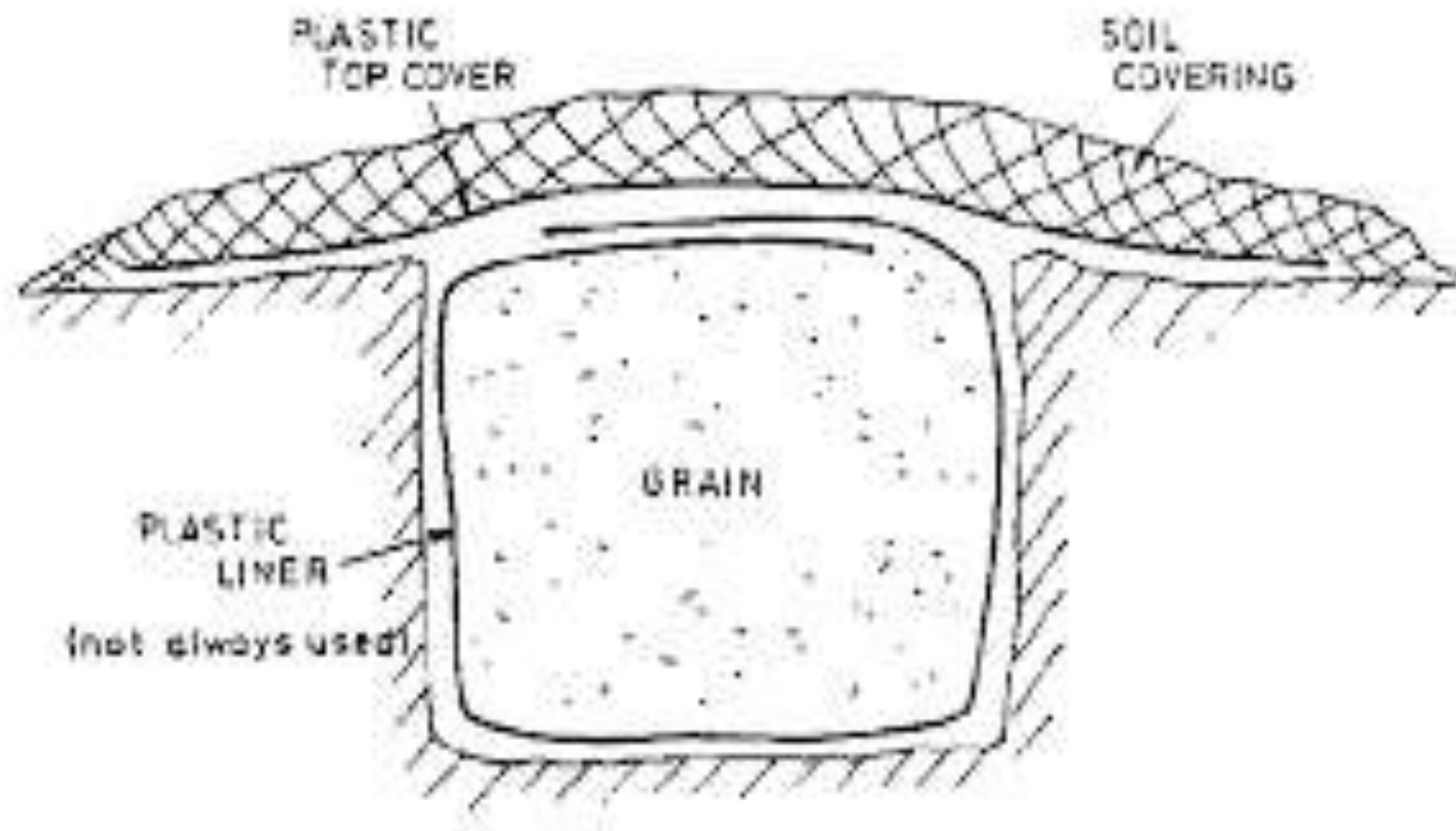
Bunker storages and horizontal storages (timber/galvanised iron walls) were next.











An **underground sheet storage** was built at Narrabri in 1975 and remained sealed well into the 1990s – still there today.

Early bunkers used earth coverings over a plastic sheet.



During WWII, insect infestations were treated with methyl bromide.

In the 1950s phosphine was being used.

But

Aeration was the most widely used method of insect control.

In 1960, malathion introduced, and use was significant.

WA were using hydrogen cyanide.





AUSTRALIAN
**GRAIN STORAGE
& PROTECTION**
CONFERENCE
Meeting Market Requirements

16-17 JUNE 2015
RYDGES
186 EXHIBITION STREET
MELBOURNE

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Pest Control Conference 1968

Fenitrothion & Bromophos are useful
protectants

with a similar activity to Malathion
when applied at the rate of 18ppm.



Peter Botta, ex GRDC Extension Team









In the years before the 1960s, *Tribolium castaneum* and *Sitophilus oryzae* were prevalent.

In the 1960s, *Rhyzopertha dominica* became prevalent because of malathion.

In 1964, it was predicted resistance would develop in insects.

In 1968 *T. castaneum* resistance to malathion detected.







Pest Control Conference & NWPGP Chairs

Jack Cass, AWB – 1973 to 1980

Jack Snelson, DPI Canberra – 1981 to 1985

Greg Hooper, National Registration Authority – 1986 to 1996

Joint Chairs, 1997 - 1998

Bill Murray, GRDC Consultant - 1999 to 2015

GRDC / Grains Australia Consultant Gerard McMullen – 2016 to current





Pest Control Conference 1971

It is essential that adequate facilities be integrated into the handling network in order that grain could be quickly and effectively disinfested

– in this regard emphasis should be placed on the provision of recirculatory type fumigation and immediate action should be taken to equip terminals and a high priority given to similar action in respect to country storages.









Pest Control Conference 1972

Storage design in the future is most vital to:

- Fumigate the store and its contents with a toxic gas*
- Swamp the contents with nitrogen, carbon dioxide, or mixtures of these gases to lower the oxygen availability*
- To aerate the contents of any store*







In 1972, *Rhyzopertha dominica* developed resistance.
Malathion became less effective and dichlorvos was used
more extensively in the early 1970s.

Pest Control Conference 1971 – Chairman stated:

*“Presently an atmosphere of crisis existed which had been
brought about by the breakdown of Malathion. However,
such a crisis can and should be met with calmness, skill
and confidence”*









To find a replacement for malathion,
and to develop an Integrated Pest Management Plan,
the **NWPGP was formed in 1973!**





- In 1963, legislation was introduced for exports to be free of live insects.
- In 1976, bioresmethrin introduced.
- In 1978, fenitrothion used.
- In late 1970s, malathion no longer used & alternative combination treatments emerged.





NWPGP

Dr Pat Collins

In recognition of outstanding service
in the field of stored grain protection.

June 2017







Recommended Wheat Treatments 1976/77

QLD / Nth NSW	12ppm Dichlorvos + 2ppm Bioresmethrin or half rate BRM for short-term storage
Sth NSW / VIC	18ppm Malathion + 2ppm Bioresmethrin or half rate BRM for short-term storage
SA / WA	Malathion only





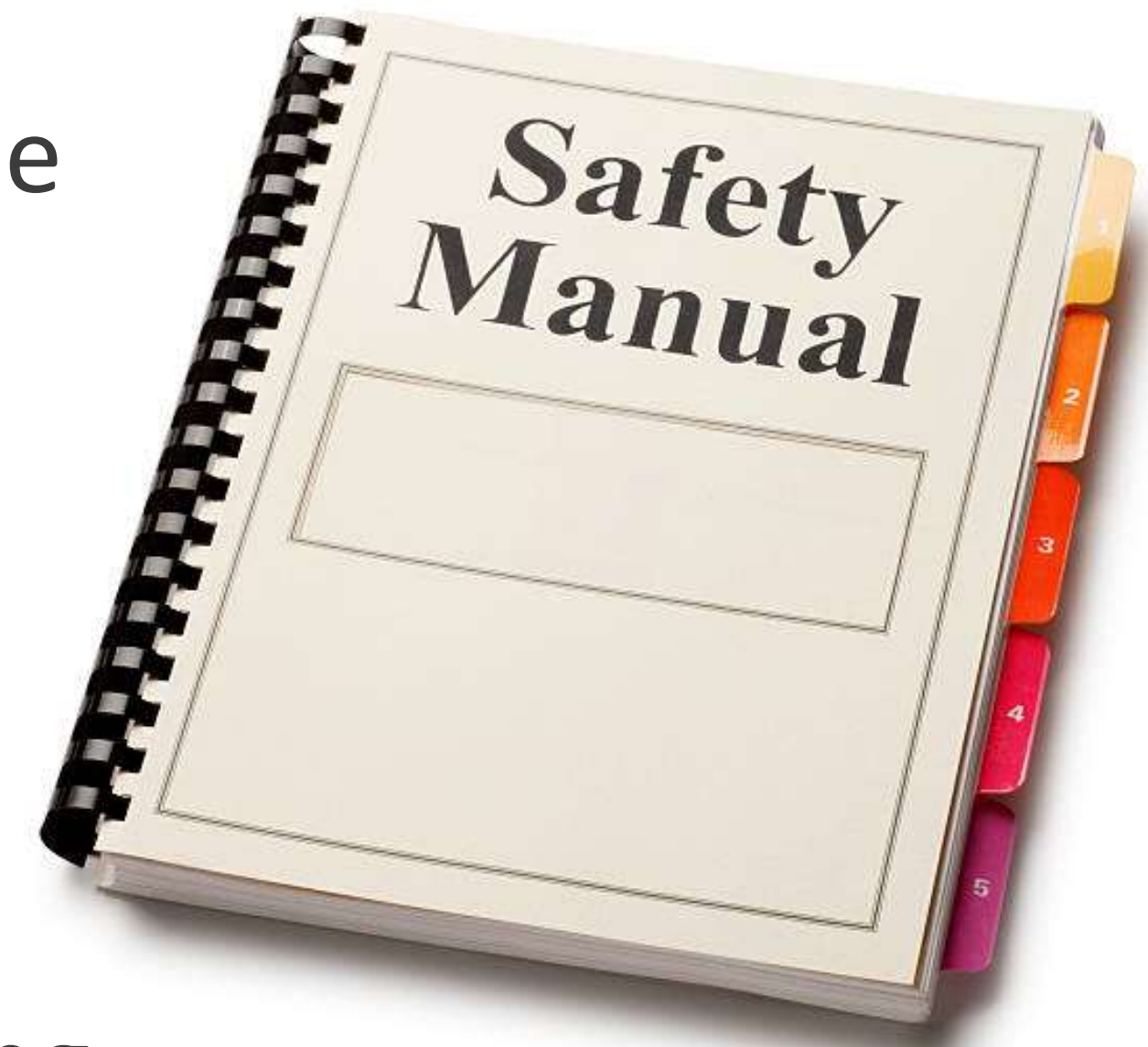
Trade Union View of Pesticides 1976

After Phosphine detected in barley road truck at Geelong Terminal

On 9 June, advised all marketing and handling authorities and the
Federal Minister of Agriculture,

*All grain exports would be stopped from Australia unless a
conference was held to discuss the safe use of pesticides.*

A conference was held, and various actions implemented including
developing a National Safety Manual.





Andrew Goyder





Seed Merchant 1979:

“We store a range of pulses for seed. We spray mist our store twice a week with Mafu (Dichlorvos) and Malathion.

It now appears that the store moth has built up tolerance to these chemicals.

Once or twice a year we apply Dieldrin or a similar chemical, which does seem to give some added control for a short period, but we are reluctant to use these on a regular basis.

I would be grateful if you could advise us of an alternative chemical or method, with minimum toxic risk to humans and the seed.”



NWPGP

To Bill Murray

*In recognition of 42 years of continuous service,
including 16 years as Chairman of the
National Working Party on Grain Protection*

*From the Strategic Working Group
and your friends and colleagues
within the Australian Grains Industry*

16 June 2015







Codex 1980 – Report on Outcome

Various recommendations for grain protectant insecticides ran into static at CCPR, largely from people who have never come up against the problem of controlling insects in stored grain, who don't understand the practice of grain protection and who misinterpret the residue limits etc....

“I see no alternative to an educational campaign which would necessitate the preparation of a comprehensive paper on the need for, history, practice, fate and acceptability of grain protectant insecticides.”





Gerard McMullen





1983 NWPGP Meeting

The Australian Wheat Board still considers the problem of high residues in grain to be a major one and has accordingly reduced the harvest treatment rate for fenitrothion.

And

The Board's pesticide residue testing laboratory is now functional.







1984 NWPGP Meeting

Note – Reference to the Australian State has been removed...

- *The attitude of farmers is a problem.*
- *There is a need for further education of farmers in proper pest control practices.*
- *The practice of fumigating grain in a truck with carbon disulphide or phosphine and then delivering to a seaboard terminal is considered extremely dangerous*
- *and a most undesirable practice which should be prevented.*











Malathions success is ironic – its effectiveness at controlling insects encouraged construction of a large number of inexpensive horizontal storages that were built with little or no provision for alternative insect control measures (i.e., fumigation or aeration).

CSIRO 1987





NWPGP 1988 & 1989



*The number of grain protectants under development should be **consolidated, priorities established, and extensive residue data generated** for submission to NH&MRC /JMPR. Continued and growing concern internationally about the **post-harvest use of chemicals on grain.***





NWPGP 1990 – Compliance with OP target

*Domestic market – 5mg/kg = **98.4%***

*China – nil OP = **0%***

*Japan – nil OP = **35%***

*Russia – 1mg/kg = **100%***

*Others – 5mg/kg = **82%***







Protectant usage maximised with the **use of aeration**.

National insect resistance monitoring commenced in **1996**.

1990s saw a significant **move away** from grain protectants following late 1980s move towards agreed **Recommended Outturn Limit (ROL)** of $\frac{1}{2}$ the MRL for all grain protectants.

ROL is maintained today for all new grain protectants if introduced & all existing protectants.





Storages were being sealed in the 1970s for effective fumigant use based on SGRL standards for sealed storages – mainly in WA.

CSIRO developed a **flow through method** of phosphine application, Siroflo.

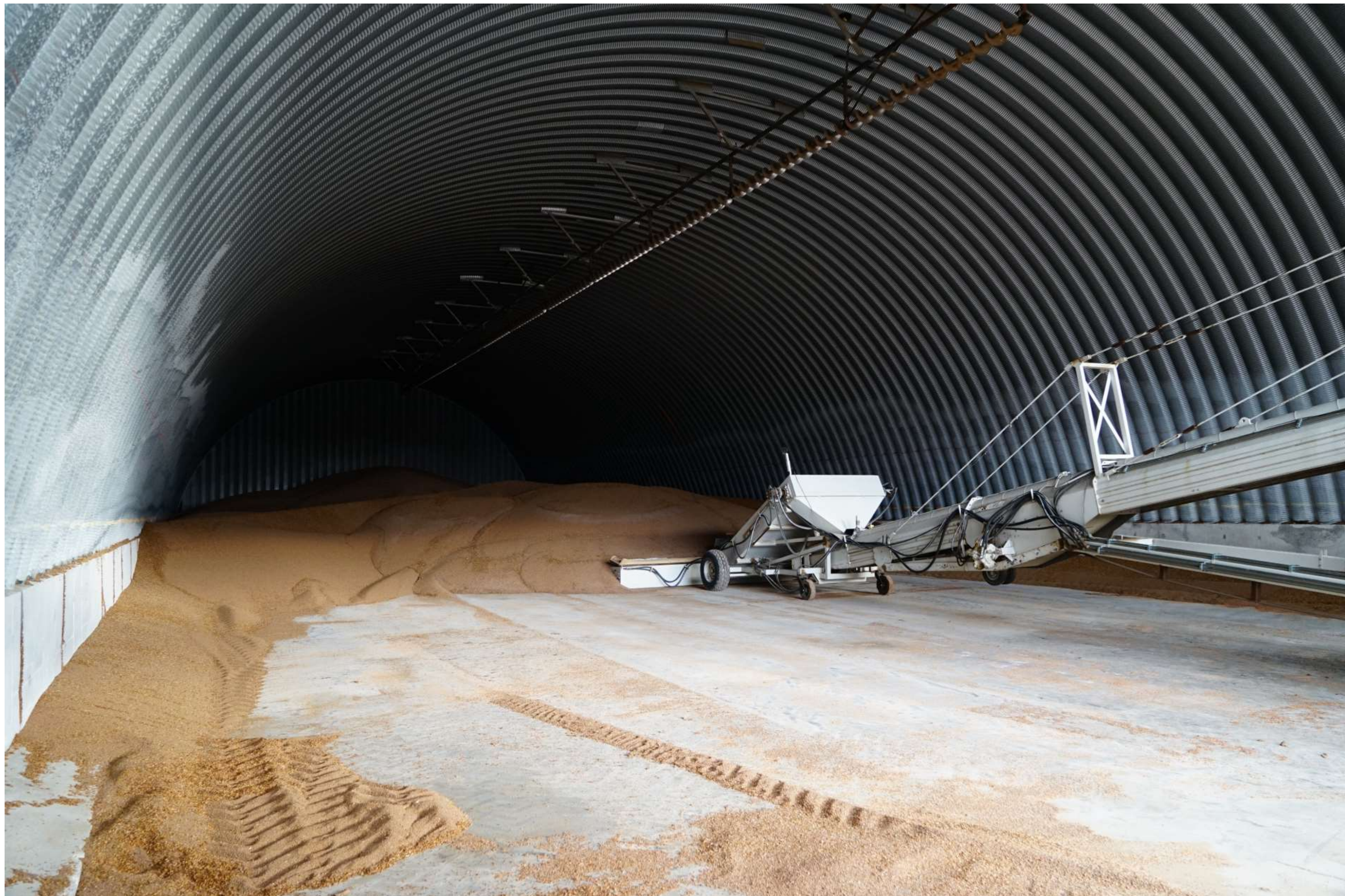
Eastern States adopted **Siroflo in 1986** as their storages had not been sealed.









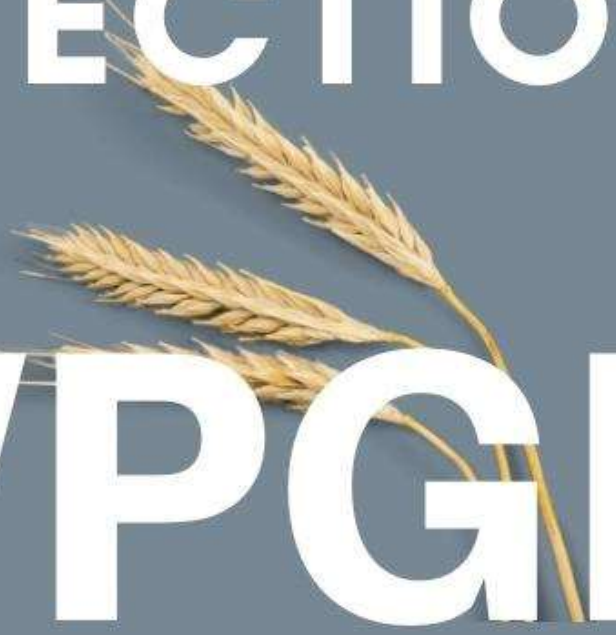








AUSTRALIAN GRAIN STORAGE & PROTECTION CONFERENCE



NWPGP

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MEETING MARKET REQUIREMENTS

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7-8 JUNE 2023

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