

National grain storage extension — phosphine awareness, use, changed practices and challenges

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Abstract. Phosphine is used to fumigate 80% of Australia's cereal crop. It was under threat from several areas and deemed by growers and the Grains Research and Development Corporation (GRDC) worthy of proactive protection. In January 2000, the GRDC commissioned a three-year national stewardship campaign to foster its more sustainable and safe use.

The campaign brought together a group of extension specialists in Western Australia, South Australia, Victoria, New South Wales and Queensland. The extension team coordinated working parties in each State, with all stakeholders to promote efficient, effective and safe on-farm use of phosphine.

The extension campaign worked with stakeholder groups, included GRDC research updates, and produced media releases such as a brochure, bumper sticker and a phosphine-use video. The extension group also recommended changes to the phosphine label, which are currently with the Australian Pesticides and Veterinary Medicines Authority.

In the final stages of the project, a survey of 243 mainland growers indicated that 23% had improved their phosphine-fumigation practices in the preceding 12 months. Key improvements made included:

- increased use of sealed storage
- applying phosphine in a manner that removes the risk of admixture with the grain
- increased awareness of the occupational health and safety risks of phosphine use.

Phosphine is still with us. While use practices have measurably improved since the inception of the project, there is room for further improvement in industry practices in relation to occupational health and safety, and application practices.

Background

At the Australian Postharvest Technical Conference in 1998 (Banks et al. 1998), a resolution was passed to set up a working group to:

- list and recommend means of avoiding poor phosphine practises
- identify strategies to enable the implementation of best-practice phosphine use.

This was in response to issues raised in discussion about poor on-farm use practices. Concern was raised about the threats to the grains industry posed by improper use and the development of resistance in pests.

Against this background, the Grains Research and Development Corporation (GRDC) nominated a 'National awareness program targeting appropriate use of phosphine, leading to accredited use of phosphine' as a priority for 2000–2001.

This paper reports on the activities and outcomes of the project, which began in January 2000 and finished in 2002.

Phosphine awareness program

The project was set up as an industry stewardship program to facilitate best management practices in phosphine use. It looked at safety, resistance and efficacy issues. State coordinators in each mainland State convened a phosphine working group to formulate and implement strategies to improve industry stewardship of phosphine so as to minimise the threats to its continued use.

The state working groups were made up of:

- grower bodies
- bulk handlers
- seed, feed and grain merchants
- AWB Limited
- chemical registrants
- grain transport and trucking companies
- silo manufacturers
- chemical use and workplace health and safety government representatives
- seed graders and cleaners
- GRDC communication specialists
- extension officers and consultants
- phosphine importers
- the Australian Pesticides and Veterinary Medicines Authority (APVMA).

The State working parties met twice throughout the project, and worked together in various ways throughout the project to promote and deliver key messages, training and extension material.

Key objectives

Key objectives of the project included:

- increased use of sealed silos
- management of insect resistance
- decreased admixture of tablets with grain
- facilitation of training
- tidying-up product labels.

Various activities were undertaken to meet these objectives.

Key activities of the project

A nationally coordinated extension program and communications campaign underpinned the activities of the project.

State coordinators undertook a variety of extension activities including:

- displays at field days, workshops and training activities
- talks at GRDC adviser and farmer updates.

- visits to retail outlets to assess knowledge and provide training to staff
- speaking at farm safety days
- responding to farmer and agribusiness inquiries.

Twelve radio interviews were conducted, and a video was made and run on national television. Numerous articles were published in newspapers and national publications such as GRDC's *Groundcover*.

Two GRDC advice sheets were developed and have been circulated throughout the various networks of the State working groups. *Sealed silos save*, the first advice sheet, deals with the features of sealed silos, how to pressure test them and ensure they are gastight and how to apply phosphine correctly. The second advice sheet, *Keep phosphine safe*, deals with the various safety issues in the use of phosphine.

The advice sheets were circulated to all grain growers via *Groundcover*, and were used by coordinators at their various extension activities and distributed widely throughout the grains industry.

A *Stop* brochure was developed by the team to be distributed at points of sale of phosphine. The brochure gives a simple explanation of the fumigation procedure, and details safe use of phosphine, emphasising that phosphine should be used only in sealed silos, should not be admixed with grain, the dangers and inefficiency of truck fumigations and safety with powder residue.

Transport operators were targeted, to raise their awareness of the danger of admixing phosphine to grain loads. A bumper sticker using the phrase 'Don't be rejected' was developed and distributed to transport operators by State coordinators and bulk-handling organisations.

Training was an issue supported by all stakeholders. Training packages addressing phosphine use were developed. Primary Industries and Resources South Australia (PIRSA), in association with ChemCert, has developed a day course on phosphine fumigation. It can be done as a stand-alone course or as a re-accreditation option under ChemCert.

A TOPACTIVE module on 'Quality grain storage' including phosphine was developed for TOPCROP Australia for delivery by TOPCROP trainers.

Label changes

The instructions on the phosphine label are confusing, and label changes have been proposed by the State working groups with support from the three major registrants of phosphine.

The two major changes are to remove from the label:

- rates for unsealed structures
- admixture recommendations.

Other issues being considered are:

- reference to out-of-print documents by Standing Committee on Agriculture and National Health and Medical Research Council on sealing of silos and safe use of phosphine

- insufficient detail on safe disposal of residues
- possible conflict between directions for ventilation periods
- clarification of the withholding period.

These recommendations are currently being reviewed by the APVMA.

Key outcomes

A survey of 243 mainland growers in 2002 indicated that 23% of growers had improved their phosphine fumigation management practices in the preceding 12 months. The main changes included reduced admixture and using more sealed storage.

The survey reported that there was an increased awareness of:

- workplace health and safety (61%)
- resistance (50%)
- the need for sealed silos (39%)
- possible residues (38%)
- rejection of loads (28%).

Other key outcomes include:

- APVMA is reviewing the label
- ChemCert now has a phosphine training module,
- The TOPACTIVE module, *Quality grain storage*
- monitoring of phosphine at receivals has increased and rejections are occurring

- cross-industry linkages have been established in each State
- an extension network with national capacity has been established.

Future challenges

While phosphine use practices have measurably improved, there is need for further improvement in:

- occupational health and safety
- effective and efficient use
- maintenance of sealed structures
- the ability of on-farm systems to meet market requirements.

These improvements are needed to ensure the grains industry can prolong the life of phosphine and deliver grain to the market specification.

The project has provided a mechanism for all stakeholders involved with phosphine to move towards more efficient and responsible use of this product. The national extension network that has been established will ensure that this approach and expertise will continue to serve the industry into the future.

Reference

Banks, H.J., Wright, E.J. and Damcevski, K.A., ed. 1998. Stored grain in Australia. Canberra, Stored Grain Research Laboratory, CSIRO Entomology, 366 p.