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Foreword

Fertilizer assists in feeding and clothing more than half the world’s population and will help the world to feed and clothe more than 9 billion people by 2050.

Fertilizer provides the nutrients essential for plant growth. Nitrogen, phosphorus, potassium and sulphur are the building blocks of all plant and animal life. As crops and animals are removed and consumed, so too are the nutrients they have taken up. For a sustainable system these nutrients must be replaced and that is the key role that fertilizers play.

Good stewardship of fertilizer use will help to ensure we can continue to feed a growing population with less impact on the environment. Increasing productivity on existing agricultural land means less native land will need to be converted to agriculture. Net greenhouse gas emissions will be less than they would be if larger scale clearing of native land for agriculture were to occur.

Fertilizer also presents a range of risks in a number of areas. The challenge for the fertilizer industry is to continue to assist in food and fibre production whilst ensuring we manage the risks that are associated with our products. Through effective stewardship, our industry is committed to managing for a sustainable future.

The members of Fertilizer Australia are committed to supporting these three strategy pillars:

- **Sustainability and Stewardship** – keeping our house in order through the implementation of codes of practice, standards, training and accreditation.
- **Engagement** – strong partnerships with government and other stakeholders to help design and implement effective policies to manage the risks and benefits of fertilizer use.
- **Information and Education** – telling our story so that good decisions can be made based on facts and the best available science.

This report forms a critical part of this commitment. It demonstrates how well our members are performing in implementing codes of practice, training, accreditation programs, and best practice standards. It also describes a range of issues, the industry’s approach to them and how well we are performing.

Our industry is committed to engaging with stakeholders in responsible policy development and implementation to ensure that our products continue to be used in a sustainable way. This is backed up by a substantial contribution to managing risks, throughout the life-cycle of our products, so that we can be a positive partner in turning good policy into effective action.

We welcome feedback and opportunities for further engagement and I trust this report will be a useful part of that process.

Jim Mole
Chairman
Introduction

Fertilizer Australia is a member-based organisation that provides a platform to allow the Australian fertilizer industry to manage risks and engage constructively in public policy development and implementation.

Working with stakeholders, such as the rest of the fertilizer industry, government, other industry bodies and interest groups, Fertilizer Australia has developed codes of practice (COP), guidance, and standards in areas of identified risk. We also manage a national training, certification and accreditation program, Fertcare®, to ensure that those working with fertilizers, or providing advice on their use, are properly trained and consistently apply high standards.

In 2013 members of Fertilizer Australia made a commitment to ensure that the codes of practice, training and guidance are being effectively implemented by all members. This is managed by a sustainability and stewardship survey which forms the basis of this report. The survey covers the 2013 to 2018 calendar years.

The survey and report identify areas for improvement both in compliance by members and in the codes, guidelines and training materials.

For a full picture of the Australian Fertilizer Industry, the benefits it provides to society and the issues it must deal with, it is recommended that you read this report in conjunction with the other information available from our website www.fertilizer.org.au.

All of the members of Fertilizer Australia are asked to complete the survey. Members who do not manufacture, transport, store or sell fertilizer or provide advice on its use, simply complete a declaration to this effect. For 2018, 19 Members met this criterion. In addition, one member is an industry association, and one a member organisation and they are not asked to complete the survey.

A list of the reporting companies is provided in Appendix 1.

In the following pages, issues are briefly described, followed by details of what the industry is doing to manage them. Details of how well the industry measures are being implemented are then provided. Changes and improvements that will be made in the future are highlighted in green text.
Principles

The Fertilizer Australia Members’ COP lists five principles that all members are expected to abide by:

• Product promotion should present accurate, fair and objective information to users and the wider public. Claims should be capable of substantiation by trial work or reference to accepted scientific literature.
• Members should provide a safe working environment, by providing appropriate training programs, abiding by applicable occupational health and environmental standards, and ensuring products are handled, stored and packaged in a safe way, in compliance with Dangerous Goods (if applicable) and other relevant legislation.
• Members should support the goals of the Department of Agriculture and Water Resources Biosecurity Division in protecting Australian Agriculture from the introduction of exotic pests, plants and diseases, and at all times comply with the current regulations and procedures in letter and in spirit.
• Members will comply with the Consumer Protection Act and will take particular care, when meeting for the purposes of Fertilizer Australia, to adhere to the Fertilizer Australia Trade Practice Compliance Guidelines.
• Members should take appropriate steps to ensure that these principles apply throughout their supply chains.

The survey asked specific questions relating to the first two principles and the results are discussed on the following pages.

Support for biosecurity measures is managed through a working group of member company staff that meets regularly with Department of Agriculture and Water Resources staff.

Compliance with the Consumer Protection Act is managed by guidelines adopted by the association. At each meeting of members, the participants are reminded that the meeting is conducted in accordance with those guidelines.

At various points, the survey asks questions about ensuring compliance within each member’s supply chain and the results are reported and discussed in each relevant section of this report.
Product Promotion

The Issue
Fertilizers have a significant positive impact on productivity for most farmers. They are also a significant input cost. Farmers are therefore constantly evaluating the most cost-effective products and techniques to maximise their return from fertilizer use. This is an incentive to the industry to develop new products and techniques. It is also an opportunity for unscrupulous operators to market products unethically, with unproven and doubtful claims.

There are many products that have been proven effective in providing nutrients to plants, either by directly supplying the nutrient element or improving the efficiency of uptake. There are also many products marketed as fertilizers, soil improvers or biological agents that are either unproven or of doubtful value.

Fertilizer Australia Response
To ensure that growers purchasing fertilizers are not misled by labelling or promotions, Fertilizer Australia members are committed to only making product efficacy claims that are capable of substantiation, either by trial work or reference to accepted scientific literature. This does not preclude the promotion of products that have unproven efficacy, as long as the purchaser is not misled about the level of confidence in the product.

Confidence in the efficacy of fertilizer products is established by glasshouse and field trials. Typically, several rates of fertilizer, including a zero rate, are applied and plant responses are measured. Responses may be yield or quality measures or a combination of both. Trials are designed so that statistical techniques can be used to analyse the results, and quantify how confident we are that the fertilizer has had a real effect. It is generally accepted that if the analysis demonstrates that there is 95% chance that the measured difference is real then this is considered statistically significant.

If statistically significant results are achieved for trials repeated over a number of locations and seasons, then there is a very high degree of confidence that the product is effective when used in the types of environments tested.

Resources
Fertcare® Accredited Advisors are independently assessed and audited to ensure that the fertilizer recommendations they make are based on good science. A list of Fertcare Accredited Advisors is available on our web site, www.fertilizer.org.au.

There are links on the Fertilizer Australia web site to good sources of science-based plant nutrition information.

Implementation
26 respondent companies were involved in product promotion during 2018.
- All 26 stated that their promotion presented accurate, fair and objective information, and that efficacy claims were capable of substantiation by trial work or reference to accepted scientific literature.
Occupational Health and Safety

The Issue
Managing occupational health and safety risk is an accepted obligation of all businesses. There is widespread community and legal expectation that people should not be injured or have their health compromised at work.

Fertilizer Australia Response
Members commit to providing a safe working environment, appropriate training programs, and ensuring products are handled, stored and packaged in a safe way. All members also commit to abiding by applicable occupational health and environmental regulations and standards.

Given the widely different types of businesses that are members of Fertilizer Australia we have not tried to produce a detailed health and safety report.

However, providing a safe workplace is one of the principles that members agree to, so we have included some general information on implementation and links to detailed reports that are publicly available from individual members.

Resources
Fertcare® training covers occupational health and safety issues specific to handling fertilizer products.
The handling code of practice addresses safety issues from loss of product containment. It is available on our website.

Implementation
• Twenty eight respondents provide a safe work environment.
• Twenty-seven of the 28 respondents covered OH&S issues in routine induction processes for all new employees. One who does not is a very small business.
  ◦ OH&S issues were covered in all job descriptions and contracts for 27 of the 28 respondents.
    One who does not is a very small business.
• Occupational Health and Safety training was provided to:
  ◦ 6,611 staff and 5,624 contractors in 2013.
  ◦ 7,434 staff and 6,180 contractors in 2014.
  ◦ 6,515 staff and 5,796 contractors in 2015.
  ◦ 6,125 staff and 5,282 contractors in 2016.
  ◦ 5,643 staff and 1,867 contractors in 2017.
  ◦ 7,134 staff and 1,450 contractors in 2018.
The member with the largest differences in contractors claims their 2016 (and earlier years) data is highly likely to have non-fertilizer parts of their business included.
• Seven member companies published occupational health and safety information, (c.f. 2017 6, 2016 7, 2015 7, 2014 10, 2013 6). Links to this information can be found on the Fertilizer Australia web site, www.fertilizer.org.au.
Security

The Issue
In 2002 terrorists bombed a nightclub in Bali killing more than 200 people, including 88 Australians. Coming after the “9/11” attacks in the USA in 2001, this brought home, to Australians, the real threat posed by extremists and the possibility that similar incidents could occur in Australia.

Some fertilizers can be used as explosive precursors and have been used in improvised explosive devices (IED’s) in many parts of the world.

Fertilizer Australia Response
Following the Bali bombing, Fertilizer Australia approached the Australian Federal Police Bomb Data Centre to discuss what actions the industry could take to help manage the risk of fertilizers being misused in this way.

Following further discussions with the Attorney General’s Department, Fertilizer Australia developed a Security COP and Security Guidelines for Agricultural Distributors.

The COP sets out a risk assessment and treatment process to help fertilizer businesses to effectively manage security risks. It contains specific requirements that must be met for products that are identified by the Australian Government as high security risk chemicals. The Guidelines include a simple checklist to assist rural retailers to manage security risk.

The Australian Government has subsequently developed a National COP for Chemicals of Security Concern, which was based on best practices from industry, including Fertilizer Australia’s COP. Fertilizer Australia was an active participant in this joint industry and Government project. Our COP and guidelines are consistent with the National COP.

The Australian Government decided in 2004 that Security Sensitive Ammonium Nitrate was the product of greatest security concern and worked with industry and the State governments to implement regulations that provide strong controls on access to these products. During the development phase, Fertilizer Australia assisted by voluntarily implementing some of the key measures that were proposed for regulation.
The Fertcare® training program includes a discussion of security and ensures participants are aware of the Security Guidelines for Agricultural Distributors. 3,401 people had received Fertcare training by the end of 2018 an increase of 143 during the year.

Resources
The Fertilizer Australia Security COP and Guidelines for Agricultural Distributors are available on the Fertilizer Australia web site, www.fertilizer.org.au, along with a link to the Australian Government Chemical Security web site.

Implementation
• 25 Fertilizer Australia members store, transport, sell or apply fertilizer products. All 25 have fully implemented the Security COP.
• For those members handling high risk chemicals, implementation within their companies has been comprehensive with some room for improvement in ensuring that their supply chain partners are also compliant, this is similar to past years.
• For those members not handling the high-risk chemicals, implementation rates are high (80%) but have not risen since 2013.
• Seventeen members have also taken action to ensure that the provisions are applied by their supply chain partners. The actions have included training, procedures, inspection of sites, contractual obligations, and record keeping.
• Nine members handle high security risk products and all nine have fully implemented the provisions of the COP that apply to these products. (c.f. 2017 11/11, 2016 10/10, 2015 9/9, 2014 10/10, 2013 12/12).

Reporting is a key measure in the Security COP, and members were asked how many incidents were reported to police or the national security hotline. Five incidents were reported to police in 2018. (c.f. 2017 7, 2016 1, 2015 4, 2014 3 and 2013 3).

Security Sensitive Ammonium Nitrate (SSAN) is covered by specific legislation and regulations in each State to manage security risk. Seven members (c.f. 2017 6, 2016 6, 2015 6, 2014 6, 2013 8) handle or sell SSAN products at a total of 17 sites (c.f. 2017 19, 2016 14, 2014 15, and 2013 22). Around 2,000 tonnes were sold to end users as SSAN. The majority of SSAN was used as an ingredient in the manufacture of blends or liquids that are not classified as SSAN.

• The efforts of the industry to formulate non SSAN products whilst retaining the agronomic advantages of ammonium nitrate and calcium ammonium nitrate have significantly reduced the risk of diversion to criminal purposes.
Purchasing (Product Quality)

The Issue
Fertilizers are sold with a stated analysis of the nutrients that they contain. They are also required to not exceed maximum permissible concentration (MPC) levels for certain impurities.

When fertilizer companies purchase finished products or ingredients, the supplier provides a certificate of analysis listing nutrient content and levels of certain impurities.

There have been several examples where the quality of imported product has not matched the certificate of analysis provided by the supplier. This is a potentially serious issue. In one case of imported fertilizer, cadmium levels far exceeded the MPC. In another, the “fertilizer” bore no relation to the claimed analysis and appeared to be simply soil.

Typically, this is managed by quality assurance systems that include an appropriate level of sampling and analysis of the product by the purchaser.

Fertilizer Australia Response
Fertilizer Australia worked with the authorities to develop a risk assessment-based COP for purchasing. Under the code, companies assess the risk for each supplier and put in place an appropriate frequency of quality assurance sampling and analysis.

Resources
The Fertilizer Australia Purchasing COP is a risk-based quality assurance methodology. As well as managing purchasing from higher risk countries it provides guidance on industry best practice. The code is available from the Fertilizer Australia web site, www.fertilizer.org.au.

Implementation
- Fifteen of the 16 respondents who purchase product or ingredients from non-members have implemented the Purchasing COP.
- Fourteen of the 15 who have implemented the COP have written procedures to ensure compliance.

The company who has not taken steps to implement the COP will be required to explain why and trained in the scope of the COP and the value of implementation.
Product Description & Labelling

The Issue
The form of nutrient and the rate of application are key components of best practice nutrient management. They are critical inputs into decisions that affect both productivity and environmental risk. Fertilizers can contain a wide range of concentrations of various forms of nutrients. Consistent description of nutrient form and content allows informed decision making.

Fertilizers can also contain impurities from the raw material or manufacturing process. Some of these can present a risk to plant health, human health and food safety.

State Governments have developed regulations to manage description and safety of fertilizers. There are many differences in the detail of the various State regulations, but all have the intention of providing consistent information to users, and managing risks.

Many companies operate in multiple States with product regularly moved between States. This makes it difficult to manage compliance with the regulations.

Fertilizer Australia Response
Working with the States, Fertilizer Australia developed a National COP for Fertilizer Description and Labelling. The COP was based on the strictest requirements of the various State regulations. It allows for consistent information to be provided to users.

Resources
The COP is available from the Fertilizer Australia web site, www.fertilizer.org.au.

Implementation
- Twenty-four respondents sell to end users, manufacture or import fertilizers. Of these, 21 (88%) fully comply with the COP and three do not. (c.f. 92% in 2017, 92% in 2016, 91% in 2015, 72% in 2014 and 68% in 2013). Of the three that do not currently comply fully:
  - two do not supply a complete label with bulk deliveries as it would not necessarily reach the farmer; and
  - one imports product labelled with oxide analysis, as used in many overseas countries, rather than the elemental analysis required in the COP.

As States progressively review their fertilizer regulations the industry will review the code of practice and how it can integrate with the regulations to ensure that users are provided with appropriate information.

Reviewing the Code of Practice may enable better standards for liquid and specialty products to be included. The original regulations on which the code is based preceded the development of these products.
Feeding the World – Caring for the Environment

The Issue
Agriculture faces the challenge of feeding an increasing world population, which is estimated to reach 9.1 billion people by 2050. This requires an overall food production increase of 70% from 2005 to 2050 (FAO 2009). This increase can be achieved through a combination of higher yields, increasing the area farmed, higher cropping intensity (number of crops per year).

Enhancing agricultural productivity will have a key role in providing food in the future. Fertilizer will be one of many technologies used together to increase food production per hectare of agricultural land.

The Australian fertilizer industry recognises that intensification, including increasing fertilizer use, can pose a risk to the environment, particularly when fertilizer is used inappropriately.

Eutrophication
Raising soil fertility with fertilizers can increase crop yield; it can also increase the risk of nutrient movement from agricultural land to waterways. The nutrients of main concern in waterways are nitrogen and phosphorus, both of which can lead to excessive algal growth, among other things. This can harm other aquatic plants and animals, including coral and fish. Algal growth can also affect the suitability of water for uses such as drinking, recreation, stock watering and agricultural irrigation.

There is national and international focus on runoff water quality from the catchments of the Great Barrier Reef in Queensland. Nutrient levels in the waterways and estuaries of the Swan and Scott River Coastal Plains of Western Australia have also attracted public concern. The movement of nutrients from the soil store, and those applied as fertilizers, is one of several factors contributing to poor water quality in both examples.

Greenhouse Gas Emissions
The manufacture of fertilizer contributes to greenhouse gas emissions. For example, when ammonia (the base product for most nitrogen fertilizers) is manufactured, natural gas is consumed both as a feedstock and as an energy source. Some of the carbon dioxide liberated in the process is captured for use in the production of urea (a major nitrogen fertilizer) and other industrial products. Excess carbon dioxide is vented to the atmosphere. In the production of phosphate fertilizers, calcium carbonate is acidulated resulting in the release of carbon dioxide. Smaller amounts of methane and nitrous oxide are release from the combustion of diesel, LPG and natural gas for energy used in the manufacturing process. Grid electricity is also a major energy source used in the manufacture of some fertilizer products.

As fertilizer products are moved around the country and applied to farmland, greenhouse gases are also released via the burning of fossil fuels such as diesel, LPG and petrol.

Fertilizers stimulate crop growth which assists in removing carbon from the atmosphere and fixing it in plant cells. However nitrous oxide can be released from agricultural land, particularly when nitrogen fertilizers are applied and the soil approaches a water saturated state. Nitrous oxide is a significant greenhouse gas.

Impurities
Some raw materials used in the manufacture of fertilizers contain impurities which can build up in soil and plants and have the potential to impact on human health. The impurities of most concern are the heavy metals: lead; cadmium; and mercury. Fluorine is found in phosphate fertilizers and may also be of concern following heavy applications over several years.

Nutrient depletion and soil erosion
Some agricultural systems remove more nutrients in farm produce than are replaced. Over time, this results in soil that is depleted of nutrients. Plant production declines and soil is more easily eroded by wind and rain. The eroded soil and any accompanying nutrients can find their way into waterways and contribute to poor water quality.
Other environmental issues
The fertilizer industry has been active in addressing other issues that have potential to cause undesirable impacts. These include:

- the use of fertilizer from organic, industrial and domestic waste streams, which can contain food and environmental contaminants;
- dust and odour at fertilizer manufacturing and distribution sites;
- water and energy use efficiency in manufacturing processes;
- stack (air) emissions from manufacturing; and
- packaging waste.

Fertilizer Australia Response
The greatest environmental risk, that fertilizers present, typically occur post application. To ensure that fertilizer users receive good advice on managing these risks the industry has developed a national product stewardship program, Fertcare®.

Fertcare also covers management of food safety risks related to impurities in fertilizers. This issue is also dealt with earlier in this report in the sections:

- Product Description and Labelling; and
- Purchasing (Product Quality).

Fertcare is a training, certification and accreditation program delivered by third parties on behalf of the fertilizer industry. Fertcare focuses on providing high quality advice to users of fertilizers. This advice assists users to optimise productivity and minimise environmental and food safety risks.

The fertilizer industry works with agricultural industry groups, natural resource managers, government, and environment groups to improve productivity and protect the environment through the means listed below:

- Use of objective measures such as soil and plant testing, and appropriate analysis and interpretation methods. This allows development of evidence based, site specific nutrient management plans to help reduce offsite nutrient losses. The basic premise being to match crop nutrient demand with the nutrient available from the soil, applied fertilizer and other nutrient sources such as animal manures. Matching nutrient supply to crop requirements reduces the potential for offsite nutrient impacts.
- The four rights or 4R’s of nutrient stewardship, applying the right product, at the right rate, right time and right place.

These 40 soil cores from the Mackay Region demonstrate the large variability in soil types. Just one of the variables that mean soil testing and site specific management is the only way to sensibly manage nutrients. (Moses Project 2013, Farmacist Pty Ltd, DAFF QLD).

Fertcare provides substance to the above approaches and has been accepted by many industry groups, government and other organisations with an interest in natural resource management as a key strategy to reduce nutrient loss to the environment.
Fertcare Training
The Fertcare program trains industry staff in the competencies required to meet their responsibilities for food safety and environmental risk management. It includes the competency to warn, advise, and refer customers to information about the risks and how to manage them.

Fertcare training was developed by professional educators and is overseen by a technical committee that includes leading public and private sector expertise in plant nutrition, food safety and environment. In addition, sections of material are reviewed by prominent scientists in the relevant field of expertise. The Fertcare program continues to be updated with the latest information, practices and guidelines as new science-based information is developed.

Fertcare training is delivered nationally by qualified providers, through a Registered Training Organisation. Each training course meets national competency standards under the Australian Qualifications Framework.

Components of Fertcare
Three Fertcare logos are used to signify compliance with various components of the program.

Fertcare Accredited Advisor (FAA):
This logo provides farmers and other stakeholders with the confidence that they are receiving high quality fertilizer advice based on soil and plant testing that meets accepted standards. Matters such as the process of making recommendations, the underlying supporting data, sampling methodology and laboratory competence are assessed to ensure they are based on good practice and accepted science in Australia. Every two years FAAs undergo a third-party audit to ensure standards are routinely applied and new information is incorporated into recommendations. Using a FAA ensures growers get comprehensive advice based on the best available information.

Accu-Spread:
This logo lets farmers know they are using professional contractors who are applying the correct rate of fertilizer where it is required in the landscape. The Accu-Spread program assesses and certifies the spreading width and uniformity of fertilizer application machinery. Machines must be reassessed within three years of the previous assessment to maintain Accu-Spread certification and drivers are Fertcare A trained.

Fertcare Organisation:
This logo signifies a business has attained full compliance with the fertilizer industry targets for training of staff and certification of contract application equipment.

For more information on Fertcare® visit www.fertcare.com.au
Implementation

- The survey revealed 81% of eligible staff in respondent companies have successfully completed Fertcare training. This compares with 94% in 2017, 76% in 2016, 77% in 2015, 82% in 2014 and 66% in 2013. Details are in the table below.

Fertilizer Australia will promote the benefits of Fertcare training to members and encourage members to work toward having 100% of their eligible staff Fertcare trained.

Fertilizer Australia will promote the benefits of soil and plant testing amongst its members, the Fertcare community and with policy makers to try and increase the number of soil and plant tests used by farmers.

Fertilizer Australia will discuss with the Australasian Soil and Analysis Council about developing a method of collating data on the total number of soil and plant tests performed each year.

Fertilizer Australia members are committed to Fertcare and target 100% adoption of the three levels of training by eligible staff. Progress towards this target is summarised in the table:

<table>
<thead>
<tr>
<th>Fertcare® – Adoption by Members</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017*</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Companies involved in fertilizer sales, advice, logistics or contract services</td>
<td>28</td>
<td>25</td>
<td>25</td>
<td>25</td>
<td>26</td>
<td>28</td>
</tr>
<tr>
<td>No. (%) of Level C (advisory) staff Fertcare® trained</td>
<td>389 (50%)</td>
<td>378 (87%)</td>
<td>255 (60%)</td>
<td>327 (77%)</td>
<td>190 (78%)</td>
<td>387 (80%)</td>
</tr>
<tr>
<td>No. (%) of Level B (sales) staff Fertcare® trained</td>
<td>244 (75%)</td>
<td>176 (74%)</td>
<td>170 (83%)</td>
<td>113 (61%)</td>
<td>103 (100%)</td>
<td>125 (73%)</td>
</tr>
<tr>
<td>No. (%) of Level A (logistics) staff Fertcare® trained</td>
<td>319 (94%)</td>
<td>262 (81%)</td>
<td>366 (86%)</td>
<td>265 (84%)</td>
<td>269 (105%)**</td>
<td>220 (88%)**</td>
</tr>
</tbody>
</table>

* Two members did not provide complete data in 2017 and have in previous years. As this organisation is a significant member it makes comparison with previous years difficult.
** Adoption percentages >100% indicate that staff who have received Fertcare training are now in a different role which is not considered eligible.

Fertcare includes participation from non-members as well as Fertilizer Australia members. Total course completions since the start of the program and current numbers of Accu-Spread, Accredited Advisors and Licensed Organisations are summarised in the table:

<table>
<thead>
<tr>
<th>Fertcare® – Total Completions</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level C (advisory) staff Fertcare® trained</td>
<td>1,273</td>
<td>1,340</td>
<td>1,388</td>
<td>1,396</td>
<td>1,490</td>
<td>1,594</td>
</tr>
<tr>
<td>Level B (sales) staff Fertcare® trained</td>
<td>727</td>
<td>748</td>
<td>764</td>
<td>779</td>
<td>804</td>
<td>821</td>
</tr>
<tr>
<td>Level A (logistics) staff Fertcare® trained</td>
<td>622</td>
<td>704</td>
<td>787</td>
<td>850</td>
<td>964</td>
<td>986</td>
</tr>
<tr>
<td>Fertcare® Accredited Advisors</td>
<td>368</td>
<td>351</td>
<td>280</td>
<td>256</td>
<td>282</td>
<td>262</td>
</tr>
<tr>
<td>Accu-Spread Certified Spreading Machines</td>
<td>87</td>
<td>94</td>
<td>76</td>
<td>74</td>
<td>84</td>
<td>80</td>
</tr>
<tr>
<td>Licensed Businesses</td>
<td>30</td>
<td>26</td>
<td>28</td>
<td>11</td>
<td>19</td>
<td>19</td>
</tr>
</tbody>
</table>
Fertilizer Handling

The Issue
Transport, storage and associated handling of fertilizer products present a range of risks including product loss, associated environmental hazards and road safety issues. Environmental risks can be summarised under the criteria of Leach, Load, Run and Blow. The table below provides a description of each, along with some of the potential consequences.

Environmental risk associated with fertilizer transport, storage & handling

<table>
<thead>
<tr>
<th>Risk</th>
<th>Description</th>
<th>Potential Consequence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leach</td>
<td>Water carrying dissolved nutrients into the soil</td>
<td>Nutrient loading and contamination of ground water</td>
</tr>
<tr>
<td>Load</td>
<td>Accumulation of nutrients and undesirable impurities / substances</td>
<td>Nutrient loading in operational areas, contaminating soils and leading to potential point source impacts</td>
</tr>
<tr>
<td>Run</td>
<td>Storm and surface water run-off carrying fertilizer and dissolved nutrients</td>
<td>Contamination of surface water bodies</td>
</tr>
<tr>
<td>Blow</td>
<td>Air quality impacts associated with fertilizer handling e.g. dust, vapours and odours</td>
<td>Air quality decline. Release of potentially toxic gases e.g. ammonia</td>
</tr>
</tbody>
</table>

Adapted from Cracking the Nutrient Code

It is in the industry’s best interests to avoid product loss, while community expectations are that off-site product loss and contamination of soil, water and air quality is minimised.

Fertilizer Australia Response
The fertilizer industry recognises its obligations to eliminate, as far as practicable the hazards resulting from the transport, storage and associated handling of fertilizer. Fertilizer Australia developed a Fertilizer Handling COP to assist members to identify and manage risks associated with fertilizer handling.

The primary focus of the COP is management of product loss and the associated hazards. It covers:
- solid and liquid fertilizer formulations;
- bulk and packaged products; and
- work-places that transport, store and handle fertilizer.

The COP provides a risk assessment and treatment approach to managing loss of product containment. As each worksite is different, individual locations are encouraged to use the COP to develop a risk management plan appropriate to the worksite which is then reviewed on a regular basis.

In addition to a risk management plan, fertilizer companies may also employ a range of environmental protection tools such as an Environment Policy, Environment Management Systems and Emergency Response Plans.
Implementation

- Of the 24 (c.f. 2017 26, 2016 23, 2015 22, 2014 24, 2013 26) members who transport, store or handle fertilizers, 23 have fully implemented the Fertilizer Handling COP, this is 96% (c.f. 92% in 2017, 91% in 2016, 86% in 2015, 91% in 2014, 77% in 2013).

- 597 sites, which constitutes 99% of all sites, have a documented risk management plan.

- 166 sites have a documented emergency response plan in addition to the COP. Some of these are primarily chemical handling sites whereas the COP relates directly to fertilizer sites.

- 23 respondents have and routinely follow, documented procedures to ensure all staff involved in handling fertilizers have information and training on risk management, 16 also have procedures in place for third party sites.

- 53% of member staff have environmental performance objectives in their job description or contract (c.f. 57% in 2017, 41% in 2016, 61% in 2015, 59% in 2014, 35% in 2013)

The table below summarises the adoption of a number of environmental management tools used by members.

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<tr>
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<tbody>
<tr>
<td>Environment Policy, Plan, Procedure</td>
<td>17 (65%)</td>
<td>15 (65%)</td>
<td>15 (79%)</td>
<td>14 (61%)</td>
<td>14 (61%)</td>
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<td>Public Environment Report</td>
<td>5 (19%)</td>
<td>6 (25%)</td>
<td>4 (21%)</td>
<td>4 (23%)</td>
<td>5 (22%)</td>
<td>3 (13%)</td>
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<tr>
<td>Environment Management System or COP</td>
<td>10 (38%)</td>
<td>11 (55%)</td>
<td>12 (63%)</td>
<td>11 (48%)</td>
<td>15 (65%)</td>
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<td>Risk Management Plan</td>
<td>22 (85%)</td>
<td>17 (71%)</td>
<td>18 (95%)</td>
<td>20 (87%)</td>
<td>20 (87%)</td>
<td>19 (79%)</td>
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<tr>
<td>Emergency Response Plan</td>
<td>24 (92%)</td>
<td>20 (83%)</td>
<td>18 (95%)</td>
<td>20 (87%)</td>
<td>17 (74%)</td>
<td>18 (75%)</td>
</tr>
<tr>
<td>Environment Performance Objectives for Employees</td>
<td>22 (85%)</td>
<td>15 (63%)</td>
<td>15 (57%)</td>
<td>15 (65%)</td>
<td>17 (74%)</td>
<td>16 (67%)</td>
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</tbody>
</table>
Eco-efficiency

The Issue
Australian manufacturers produced 2.9 million tonnes of fertilizer in 2018 (c.f. 3.0 in 2017, 2.7 in 2016, 3 in 2015, 2.5 in 2014, 2.3 in 2013). It is sold to both domestic and export markets. Manufacturing includes processing raw materials such as atmospheric nitrogen and phosphate rock from both domestic deposits and imported sources, into fertilizer products.

The production of fertilizers consumes significant quantities of energy (e.g. electricity, natural gas, and diesel) and water. Fertilizer manufacturing also liberates greenhouse gases, both from the consumption and use of energy and from the production processes.

The efficient use of resources like energy and water, along with management of greenhouse gas and other pollutants are of broader social interest.

Fertilizer Australia Response
In 2003 the fertilizer industry signed the Eco-efficiency Agreement with the Australian Government. The agreement committed the industry to a range of activities aimed at enhancing a culture of eco-efficiency.

These efforts have been reported in the annual Public Environment Report for the years 2002 to 2012. From 2013 onwards, eco-efficiency measures are included in this Sustainability and Stewardship Report. The data reported includes absolute quantities, and ratios that provide indicators of eco-efficiency trends.

Fertilizer Australia also presents two Environment Awards every three years. The aim of the Environment Awards is to encourage and publicly acknowledge company and individual efforts to improve environmental outcomes and achieve a positive industry profile.
Resources
The eco-efficiency reports from 2002 to 2012 are available in the publications area of the Fertilizer Australia web site, www.fertilizer.org.au.

Implementation

Regulatory Compliance
Thirteen (13) members have 58 sites that operate under state environment protection licenses. During 2018, four companies reported a total of 8 licence breaches relating to five sites. All were minor in nature, and related to issues with stormwater, tracking of product onto roadways and loss of containment. All resulted in remedial actions.

<table>
<thead>
<tr>
<th>Regulation</th>
<th>2013</th>
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<td>No. of EPA licensed premises</td>
<td>62</td>
<td>63</td>
<td>57</td>
<td>58</td>
<td>59</td>
<td>58</td>
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<tr>
<td>No. of non-compliant events (no. of sites)</td>
<td>23 (6)</td>
<td>6 (3)</td>
<td>10 (3)</td>
<td>9 (4)</td>
<td>12 (6)</td>
<td>8 (5)</td>
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Environment Protection Improvement Measures
Eleven members invested in improved processes, product and systems to minimise adverse environmental impacts including:
• emissions reductions;
• re-use of water in manufacturing systems;
• improved cleaning and associated controls;
• dust control;
• benchmarking;
• packaging reduction / recycling; and
• storm-water improvements.

Members also invested in new fertilizer product technology to improve the efficiency of fertilizer use by end-users. This included polymer coating technology, nitrogen inhibitors (e.g. nitrification and urease inhibitors), new nitrogen products, products to improve water penetration improvement in sodic soils, liquid lime suspension, organic acid & bio-stimulants and soil biology research to improve nutrient uptake efficiency.

<table>
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<tr>
<th>Environment Improvement Measures</th>
<th>2013</th>
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<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
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</thead>
<tbody>
<tr>
<td>No. (%) of companies implementing improvement measures</td>
<td>10 (42%)</td>
<td>12 (50%)</td>
<td>16 (70%)</td>
<td>16 (61%)</td>
<td>16 (59%)</td>
<td>14 (50%)</td>
</tr>
<tr>
<td>No. (%) of companies investing in research on reducing potential adverse impacts in manufacture</td>
<td>16 (67%)</td>
<td>6 (24%)</td>
<td>8 (35%)</td>
<td>7 (27%)</td>
<td>9 (33%)</td>
<td>11 (39%)</td>
</tr>
<tr>
<td>No. (%) of companies working on more efficient fertilizer products/technologies</td>
<td>16 (67%)</td>
<td>16 (64%)</td>
<td>17 (74%)</td>
<td>18 (69%)</td>
<td>13 (48%)</td>
<td>16 (57%)</td>
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Packaging
Approximately 90% of the fertilizer sold in Australia is currently handled in bulk. The packaging recycling efforts of members for the 10% sold in packaged form is summarised below.

<table>
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<tr>
<th>No. of companies with recycling procedures for:</th>
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<th>2015</th>
<th>2016</th>
<th>2017</th>
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<tbody>
<tr>
<td>Multi-trip bags</td>
<td>6 out of 15 (40%)</td>
<td>2 out of 12 (17%)</td>
<td>2 out of 2 (100%)</td>
<td>2 out of 2 (100%)</td>
<td>0 out of 1 (0%)</td>
<td>No multi-trip bags used</td>
</tr>
<tr>
<td>Single-trip bags</td>
<td>3 out of 20 (15%)</td>
<td>3 out of 17 (18%)</td>
<td>4 out of 9 (44%)</td>
<td>5 out of 14 (36%)</td>
<td>2 out of 9 (22%)</td>
<td>6 out of 10 (60%)</td>
</tr>
<tr>
<td>Packs &gt;25kg and &lt;50kg</td>
<td>1 out of 15 (7%)</td>
<td>0 of 11</td>
<td>0 of 4</td>
<td>1 out of 6 (17%)</td>
<td>0 out of 3 (0%)</td>
<td>3 out of 5 (60%)</td>
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<tr>
<td>Packs 25kg and less</td>
<td>1 out of 18 (6%)</td>
<td>2 out of 14 (14%)</td>
<td>2 out of 8 (25%)</td>
<td>4 out of 12 (33%)</td>
<td>0 out of 7 (0%)</td>
<td>5 out of 9 (55%)</td>
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<tr>
<td>Liquid containers mini-bulk</td>
<td></td>
<td></td>
<td></td>
<td>8 out of 10 (80%)</td>
<td>6 of 8 (75%)</td>
<td>4 out of 5 (80%)</td>
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<tr>
<td>Liquid containers &gt;20L and &lt;100L</td>
<td>4 out of 13 (31%)</td>
<td>0 out of 11</td>
<td>1 out of 2 (50%)</td>
<td>4 out of 6 (67%)</td>
<td>2 of 3 (67%)</td>
<td>3 out of 4 (75%)</td>
</tr>
<tr>
<td>Liquid Containers 20L and less</td>
<td>6 out of 16 (38%)</td>
<td>3 out of 10 (30%)</td>
<td>2 out of 2 (100%)</td>
<td>5 out of 6 (83%)</td>
<td>4 of 4 (100%)</td>
<td>6 out of 6 (100%)</td>
</tr>
<tr>
<td>No. of companies participating in National Packaging Covenant, DrumMUSTER etc</td>
<td>11 out of 21 (52%)</td>
<td>12 out of 24 (50%)</td>
<td>8 out of 18 (44%)</td>
<td>9 out of 19 (47%)</td>
<td>12 of 27 (44%)</td>
<td>13 out of 24 (54%)</td>
</tr>
</tbody>
</table>

Several member companies are currently considering how to improve recycling rates, in particular for single trip bags. The Board of Fertilizer Australia recognises that rates need to improve but agreed that this is a matter for individual companies to manage.

**Fertilizer Australia will continue to monitor the issue of package recycling.**
Engagement & Community

Engagement
Fertilizer Australia engages with Government, the science community and interest groups in the areas covered by our strategy. Individual members contribute to this work and also have direct engagement with a wide range of stakeholders. The survey asked members about their direct engagement with stakeholders related to sustainability and stewardship. Members had significant involvement with the following over the period 2013-2018:

- National Agribusiness Reference Group (Grains Research and Development Corporation)
- AusVeg
- Tasmanian Government Climate Change in Agriculture Policy - workshop participant
- Tasmanian Government EPA Director regarding environmental impacts and mitigation strategies
- Australian Department of Agriculture biosecurity branch
- South West Catchment Council Working Group (WA)
- Kwinana Industries Council (WA)
- Kwinana Communities and Industry Forum (WA)
- Kwinana Industries Public Safety Liaison Group (WA)
- Port Adelaide Fertiliser Committee. Issues around product discharge from vessels to storage, EPA issues and standardising procedures. (SA)
- Carbon Farming Initiative
- Direct Action Plan (Greenhouse gas)
- Great Barrier Reef, various forums
- Dairy industry – various projects and forums
- National Nitrous Oxide Research Project advisory committee
- Consultative Forum for the Australian Dairy Industry Sustainability Framework
- Australian Wool Institute, sustainability discussions
- Plastics and Chemicals Industry Association Sustainability Leadership Council
• Sports Turf Association (WA)
• Nursery and Garden Industry (WA)
• University of Western Australia Turf Committee
• Water Corporation Industry Reference Group (WA)
• Great Gardens and the Forever Project
• Canegrowers – consultation on best management practices
• Nitrogen Forum (Townsville, QLD)
• Stakeholder group – Port Adelaide Fertilizer Handling
• Sugar industry projects
• Cane productivity boards
• Project Catalyst (cane industry)
• Cotton industry projects
• South West Catchment Council (WA) working group
• SAGIT – NUE in hostile soils
• Kooragang Island Industry Forum
• Newcastle Port Users group
• Farm improvement groups including: Liebe, Evergreen, Facie, MiG, Southern Dirt
• National Agricultural Nitrous Oxide Research Project
• Departments of Environment and Heritage Protection
• Clean Coastal Catchment project
• Horticultural focused associations e.g. avocado, mango and nuts

Community
Fertilizer Australia members operate in many communities from industrial hubs like Kwinana to small rural towns like Kaniva. They contribute both time and money to local events and activities and support significant national programs like the Royal Flying Doctor Service.

Whilst not a comprehensive list, the following examples were provided by members completing the survey from 2013 to 2018.

• Sponsor country town sporting clubs and community crop schemes for fund raising purposes. ~$100K p.a.
• We have a proud history of community support, ranging from philanthropic donations (e.g. for local sporting or community groups) through to disaster relief clean-up efforts and sharing our business expertise through information sessions in schools. In 2015 our total community investment, inclusive of Corporate Funding, was over $0.3 million. This supported a range of local community initiatives including Local Men’s sheds and a number of school projects across regional Australia.
• State-wide sponsorship of WACA Regional Cricket who employ regional cricket officers who meet with country school children and teach cricket skills. Esperance bush fire response, community funding and soil testing for farmers. Local sponsorship of community groups and sporting clubs such as golf clubs, bowls clubs, football clubs etc. Total $550,000 p.a
• Great Gardens Sponsorship. This organisation offers free environmental education to the public in the form of workshops, open days, garden to table food events and GGTV (online video education tool). Aim is to inspire and empower sustainable communities. We supported them with product donation and event sponsorship throughout the year with an approximate cost of $15,000 in 2013.
• Forever Project sponsorship.
• We are involved with Men’s Health with a number of our agents in Western Australia and promoting this at our twice-yearly dealer conference with speakers and advisors being available at a local level to assist.
• Araluen Chilli Festival Sponsorship. Cultural event that celebrates the unique culinary and cultural aspects of chillies. Growing your own and cooking with chillies and supports local producers of chilli products. $1000.
• Various Sponsorships of Gardening Clubs and Competitions such as, Pelargonium society of WA and Rockingham Beautiful Gardens Competition. Approx. $500
• Sponsorship of Junior Rugby League (Albany Creek); Junior Soccer (Withcott); Disability Sports (Horsham); Senior Rugby Union (Goondiwindi); QLD Rugby Union Referees (Darling Downs); Junior Education (Rowena Public School, Mungindi Pre-School); Cane-Farmers (Next Gen, mentoring program)
- Relay for Life, Sucrogen - Indi 300
- Sponsorship of Red Cross $360K
- Local sporting activities
- Sponsorship of community sporting clubs & support of Royal Flying Doctor Service ~$100,000 p.a
- Scotts Miracle Gro has a stewardship program combined with philanthropic funding towards activities benefiting the community locally. It makes donations to charities and provides resources with staff to implement creative programs to provide value in the community.
- Sponsor country town sporting clubs and community crop schemes for fund raising purposes.
- Sponsorship, Horsham disabled sports
- Sponsorship, regional junior rugby and rugby referees
- Sponsorship regional pony club
- Donations and support to Aussie Helpers
- Through our agent network in Western Australia, we regularly sponsor small local events such as golf tournaments for Men’s Health and the local football team. This is small scale and very local. Total cost would be around $5,000
- Beyond Blue - customer and staff welfare and health. Localised contributions from branches to various causes nationally
- Landcare - fertilizer for tree planting
- Student education scholarships
Appendix 1 – Fertilizer Australia Members 2013-18

Fertilizer Australia encourages all entities involved in the Australian fertilizer industry to become members. The following table lists member companies in each of the six years of the survey. Respondents to the survey are indicated with a tick, non-respondents with a cross, and a blank cell indicates that the organisation was not a member for that period.

<table>
<thead>
<tr>
<th>ORDINARY MEMBERS</th>
<th>2013</th>
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<th>2015</th>
<th>2016</th>
<th>2017</th>
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* Member based organisations not asked to report from 2014 onwards.
### ASSOCIATE MEMBERS

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