National Code of Practice

for

Fertilizer Description & Labelling

March 11, 2011

This code of practice is for the purposes of consultation and approval. Until such time as it is formally recognised in each State and Territory, products must continue to comply with existing legislation where there is variance between the legislation and this code.

Document Control

This document is controlled by the Fertilizer Working Group
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Purpose

Description and labelling of fertilizers provides users with important information on nutrient content and form that enables informed decision making on use rates, application methods and timing. These decisions can have significant impacts on productivity and on losses to the environment.

Users are also provided with information on impurities that may result in food safety or environmental problems if fertilizer products are used inappropriately.

A national code of practice allows for consistent information to be provided to users of fertilizers in all Australian jurisdictions.

State and Territory Acts and regulations contain provisions for important food safety and environmental controls such as the setting of maximum permissible concentrations for certain impurities. These standards are reflected in the code of practice and compliance with the code of practice will meet the requirements of all States and Territories.

This code of practice also addresses occupational health and safety issues associated with manual handling by specifying a maximum package size.

Scope

A national definition of fertilizer has been agreed as; any substance that is manufactured, represented, supplied or used as a means of directly or indirectly

i. fertilizing the soil; or
ii. supplying nutrients to plants; or
iii. conditioning the soil by altering the chemical, physical or biological condition of the soil.

This code of practice applies only to substances with attributes that achieve parts i and ii of the above definition.

A separate code of practice is being developed for substances that achieve part iii of the above definition. Until this subsequent code of practice is developed and adopted State and Territory Acts and Regulations should be consulted and complied with for products covered by part iii.

Other Acts and Regulations

This Code of practice covers specific requirements for standards and labelling of fertilizers. Other Acts and Regulations may also apply to fertilizer labelling and or use, including:

- Dangerous goods regulations;
- National Code of Practice for the Labelling of Workplace Substances [NOHSC:2012(1994)] (Hazardous goods).

In Western Australia maximum concentrations of phosphorus and ratios of phosphorus to nitrogen for domestic use fertilizers are prescribed in the Environmental Protection (Packaged Fertiliser) Regulations 2010.

Glossary

AFPC	Association of Fertilizer and Phosphate Chemists
AOAC	Association of Analytical Chemists International
Custom Blends	Fertilizer blended for a specific customer order rather than provided as part of a company's range of products.
Labchek	A New Zealand based laboratory proficiency services company
ILCP	Inter laboratory comparison program run by Unified Industries
Impurities	Substances that occur in fertilizers as a result of their occurrence in fertilizer raw materials, or as a result of manufacturing processes that may have undesirable effects.
Magruder	A check sample program for fertilizer analysis sponsored by the Association of American Plant Food Control Officials (AAPFCO) and The Fertilizer Institute (TFI).
Maximum Permissible Concentration (MPC)	The regulated maximum concentration of a substance permitted in a fertilizer
NATA	National Association of Testing Authorities, Australia
Nutrients (Macro-Nutrients) (Micro-Nutrients)	The elements needed to support plant growth; Macro-nutrients are required in relatively large amounts: Nitrogen (N), phosphorus (P), potassium (K), sulphur (S), calcium (Ca), magnesium (Mg). Micro-nutrients or trace elements are required in relatively small amounts: Boron (B), cobalt (Co), copper (Cu), chlorine (Cl), iron (Fe), manganese (Mn), molybdenum (Mo), silicon (Si) and zinc (Zn).
Phosphatic (or phosphorus) Fertilizer	A fertilizer containing greater than 2% P
Relative Tolerance	The acceptable variation above or below the stated concentration for a nutrient, expressed as a percentage of the stated concentration.
Trigger Concentration	The concentration of a substance that requires additional measures.

The Label

1.1. The purpose of the label is to provide information to users in a clear, consistent and legible format.

1.2. Printing

1.2.1. The label is to be in English.

1.2.2. Information that is printed on a label, invoice or delivery docket in English may be repeated on the label or invoice in another language.

1.2.3. Lettering is to be clearly legible.

1.2.4. Lettering is to be indelible.

1.2.5. Lettering is to be in a distinctly contrasting colour to the background colour.

1.2.6. The size of characters shall be proportional to the size of the label, invoice or delivery docket, but not less than 2 millimetres high.

1.2.7. In accordance with the National Trade Measurement Regulations 2009, the minimum character size of the measurement marking (for net weight) on a package depends on the maximum dimension of the package:

- For rectangular packages the maximum dimension is the greater of the height, length or breadth of the package;
- For cylindrical, oval etc packages the maximum dimension is the greater of the height, length or diameter of the package; and
- If the measurement marking is stamped or embossed instead of printed, the character size must be at least three times the minimum character size from the table below.
- If you use an NMI-approved printing device for the measurement marking, the characters must be at least 3mm high.

Maximum Dimension of Package	Minimum character height of printed numbers/letters
120 mm or less	2 mm
121-230 mm	2.5 mm
231-360 mm	3.3 mm
Over 360 mm	4.8 mm

1.2.8. If a fertilizer is sold in a package, the printing is to be on the outside face of the package or on a label attached to the outside of the package and easily read without opening the package.

1.3. Delivery of labels to end users for bulk fertilizers.

1.3.1. The label is to be provided as part of each sales transaction. It may form part of the invoice or delivery docket or be provided at the same time or prior to delivery on a separate sheet.

1.3.2. Where the end user does not take delivery of the product the label is to be faxed, posted or otherwise delivered directly to the user prior to or within 24 hours of dispatch of the product

1.3.3. Where there are multiple deliveries to fill a single order of the same product to a customer the label need only be supplied with the first delivery unless there is any change to the product specification that would result in a change to the label in which case the new label must be supplied. Where a label is not supplied with a delivery, each delivery docket must state the name of the fertilizer.

2. Naming of Fertilizers

2.1. Standards for naming are required to prevent the names of fertilizers misleading consumers about their content.

2.2. A fertilizer is to be named so as to make the fertilizer easily distinguishable from all other fertilizers.

2.3. The name of a fertilizer is not to be inappropriate or misleading.

2.4. For a fertilizer that contains any of the nutrients N, P, K or S above the minimum level for inclusion on the label, and for which the level of inclusion is stated, then the concentration of N, P, K and S, including zero values where no claim is made for inclusion, are to be printed directly below the product name, enclosed in parenthesis and separated by hyphens in the order N-P-K-S. The values are to be whole numbers (%), rounded down from and including the mid range (i.e. for 0.5 round down). The lettering for the concentration must be at least 25% of the size of the lettering for the name.

2.4.1. Where AVPMA regulations require active ingredients to be stated below the product name the nutrient analysis should be printed immediately below the statement of active ingredients.

3. Basis of Analysis

3.1. For all elements the concentration should be stated:

3.1.1. In the elemental form (e.g. P, K) not the oxide form as is the case in some countries (e.g. P_2O K_2O).

3.1.2. For solid fertilizers, percentage or grams per kilogram on a weight for weight basis as supplied. (e.g. 4.1% w/w 41g/kg w/w)

3.1.3. For liquid fertilizers, on a weight for volume basis, as percentage weight for volume, with the method to be stated. (e.g. 4.1% w/v) The concentration may **in addition** be stated as grams per litre or milligrams per litre in the same manner (e.g. 4.1% w/v and (optionally) 41g/L)

3.1.4. For anhydrous ammonia, percentage on a weight for weight basis. (e.g. 82% w/w.

3.2. For impurities, concentrations are to be stated on a weight for weight basis.

4. Minimum Levels for Inclusion of Nutrients

4.1. Setting minimum levels for allowable inclusion of nutrients on the label prevents misleading claims that a product contains a nutrient when the concentration is too low to provide any recognised nutritional benefit.

4.2. Nutrients may only be included on the label if they meet or exceed the concentrations listed in the tables below. A nutrient may be present above these concentrations but not claimed by the manufacturer/supplier in which case they will not appear on the label.

Minimum nutrient concentrations in solid fertilizers	
Nutrient	**Minimum (%)**
N, P, K, S, Ca, Mg, Si	0.5
Fe	0.1
Cu, Mn, Zn	0.05
B	0.02
Mo, Co, Se	0.001

Minimum nutrient concentrations in liquid fertilizers and soluble solids intended only for use in solution.	
Nutrient	**Minimum (%)**
N, P, K, S, Si	0.1
Ca, Mg	0.1
B, Cu, Fe, Mn, Zn,	0.005
Co, Se, Mo	0.001

4.3. Forms of Nutrient

4.4. The form(s) in which claimed nutrients are present and the percentage of each must be stated on the label as detailed in the following table.

Nutrient	**Forms to be shown**
Nitrogen	N as nitrate N as ammonium N as urea N in any other form (form to be stated) N Total
Phosphorus	P as water soluble P as citrate soluble* P as citrate insoluble* P Total
Potassium	K as chloride K as nitrate K as phosphate K as sulphate K as carbonate K as thiosulphate K in any other form (form to be stated) K Total

Nutrient	Forms to be shown
Calcium	Ca as carbonate Ca as hydroxide Ca as oxide Ca as sulphate Ca as nitrate Ca as chloride Ca as superphosphate (or phosphate) Ca as silicate Ca in any other form (form to be stated) Ca Total
Magnesium	Mg as carbonate Mg as hydroxide Mg as oxide Mg as silicate Mg as sulphate Mg as nitrate Mg as chloride Mg in any other form (form to be stated) Mg as total
Sulphur	S as sulphate S as elemental S in any other form (form to be stated) S as total
Silicon	Si (form to be stated)
Micro-nutrients as straight products, dry blend or when no chemical interaction occurs	The various forms composing the total analysis must be stated along with the concentration of each form. For chelates, the type of chelate should be stated.
Micro-nutrients added during a manufacturing process and for which the final form is not known.	The name of the micro-nutrient and the statement – Added during manufacturing process as [state form] and chemical interactions may have changed the form
Nutrients not essential to plants that are added as a means of indirectly supplementing grazing animals.	The concentration of the element, chemical form or product name and all other information that may be required by the Australian Pesticides and Veterinary Medicines Authority.
*Citrate solubility is to be determined in ammonium citrate.	

5. Product Tolerances

5.1. Fertilizers are not homogeneous and will contain variation in composition and analysis within parcels of product. Good practice manufacture and blending should produce product within the relative tolerances from stated analysis listed in the table below.

Nutrient Concentration (%)	Relative Tolerance (%)
25 and above	5
Above 10 and less than 25	7
Less than 10	10
< 1 (except Mo)	15
< 1 (Mo)	30

5.2. Note that there are no tolerances for impurities; they must always be below the Maximum Permissible Concentration.

6. Impurities – Maximum Permissible Concentrations

6.1. Certain impurities occur in fertilizer products due to their occurrence in the source material or as a product of the manufacturing process. For impurities of concern maximum permissible concentrations (MPC's) have been set. These levels as listed in the following table must not be exceeded.

Cadmium (Cd)	
Fertilizer Type	**MPC**
Phosphatic Fertilizer (2% P or higher)	300mg Cd/kg phosphorus
Trace Elements	50mg Cd/kg product
Other Fertilizers	10mg Cd/kg product
Lead (Pb)	
Fertilizer Type	**MPC**
Wholly Constituted of Trace Elements	2000mg Pb/kg product
Partially Constituted of Trace Element	500mg Pb/kg product
Fertilizer >25% organic matter	300mg Pb/kg product
Other Fertilizer	100mg Pb/kg product
Mercury (Hg)	
Fertilizer Type	**MPC**
All	5mg Hg/kg product
Fluorine (F)	
Fertilizer Type	**MPC**
Superphosphate	2.5%
Rock Phosphate	4.0%

7. Statement of Concentration and Warning Statements

7.1. Certain impurities and some nutrients whilst otherwise acceptable present risks in certain use situations. The concentration of the impurity or nutrient is to be stated on the label if it exceeds a trigger concentration as summarized in the following table.

7.2. The statement of impurities present and their concentration should be clearly separated from the statement of nutrients under a heading **"Impurities**". This avoids confusion as to why these elements are "claimed" on the label.

7.3. Where molybdenum or selenium are present as additives they should be listed with the claimed analysis rather than with impurities.

Impurity/Additive Concentration to be stated on the label.			
Fertilizer	Impurity/Additive	Trigger Concentration	Form
Urea	Biuret	Always	g biuret/kg N
Phosphatic (>2%P)	Fluorine	If > 40g F/kg P.	F% and as g F/kg P.
All	Molybdenum	If > 0.001%	%
All	Selenium	If > 0.001%	%
All non phosphatic	Cadmium	If > 1 mg/kg	mg/kg
Phosphatic (>2%P)	Cadmium	If > 1mg/kg	mg/kg and as mg Cd/kg P
All	Lead	If > 20 mg/kg	mg/kg
All	Mercury	If > 0.2 mg/kg	mg/kg

7.4. Warning statements are provided to inform users of these risks and these warnings are triggered by a concentration level. A "WARNING" caption or heading should appear on the label, with the appropriate warning statements as detailed in the following table.

7.5. Directly below any required warning statements the text "Users are encouraged to seek further advice" should be included.

Fertilizer	Impurity / Issue	Trigger Concentration	Warning Statement
All Solid Fertilizers	Dust	Always	Do not swallow. The dust from this product may act as an irritant. Avoid inhalation and contact with the eyes and skin.
All Liquid Fertilizers	Vapour/ Spray	Always	Do not swallow. The spray from this product may act as an irritant. Avoid inhalation and contact with the eyes and skin.
Urea			
For fertilizers containing urea that may be foliar-applied.	Biuret	< 10 g/kg of N	No warning statement is required.
		Between 10 g and 20 g/kg N	This fertilizer contains biuret. Repeated foliar sprays may cause damage to citrus.
		Between 20 and 30 g/kg N	This fertilizer contains biuret. It is not recommended for repeated foliar applications on horticultural crops.
		> 30 g/kg N	This fertilizer contains biuret. It is not recommended for foliar application except on turf.
For fertilizers that contain urea but are not intended for foliar application.	Biuret		This fertilizer is for soil application only. Do not use in foliar sprays.
Phosphatic Fertilizers	F	40g F/kg P	This product contains fluorine as an impurity. Do not feed this product to livestock or use in stock feed mixtures. If top dressing pastures do not graze for 3 weeks or until rain or irrigation is received.
Fertilizer containing Phosphorous Acid and/or its salts containing the Phosphite Ion.			Use of this product in crops for which a Phosphorous Acid Maximum Residue limit has not been established may cause detectable levels in farm produce and adversely affect saleability. It must not be used in foliar sprays.

Pasture Fertilizers			
Containing Molybdenum	Mo	> 0.001% Mo.	Excessive use of molybdenum (Mo) can be harmful to stock. Plant levels of Mo can be high for 4 weeks after application. It is advisable to keep stock off treated areas for this period. Molybdenum application may induce copper deficiency in grazing animals. This is most likely to occur on sandy soils low in copper. Check rate and frequency of molybdenum use with appropriate authorities.
Containing Selenium	Se	> 0.001% Se	Excessive use of selenium (Se) can be toxic to livestock. This product should not be used if selenium deficiency does not exist in stock grazing on the area where it is to be applied. Do not allow stock access to spilt or unused fertilizer. This product must not be applied at a rate greater than that stated on the label or advice note.
Soluble, suspension and Liquid Fertilizers	Pb	>500mg Pb/kg	For soil application only. This product is unsuitable for use as a foliar spray.
All Fertilizers	Cd	> 1 mg/kg	This product contains heavy metal impurities. Its use may result in accumulation of cadmium in the soil. Depending on soil characteristics, irrigation water quality, plant species and variety, crop uptake of cadmium may lead to residue levels in plant and animal products in excess of the maximum level specified by the Australia New Zealand Food Standards Code. In pasture, the offal from grazing animals may also exceed these limits.
	Pb	> 20 mg/kg	This product contains heavy metal impurities. Its use may result in accumulation of lead in the soil and may lead to residue levels in plant and animal products in excess of the maximum level specified by the Australia New Zealand Food Standards Code.
	Hg	> 0.2 mg/kg	This product contains heavy metal impurities. Its use may result in accumulation of mercury in the soil and may lead to residue levels in plant and animal products in excess of the maximum level specified by the Australia New Zealand Food Standards Code.

	Cd & Pb	Each element as above	This product contains heavy metal impurities. Its use may result in accumulation of cadmium and lead in the soil. Depending on soil characteristics, irrigation water quality, plant species and variety, crop uptake of cadmium may lead to residue levels in plant and animal products in excess of the maximum level specified by the Australia New Zealand Food Standards Code. In pasture, the offal from grazing animals may also exceed these limits.
	Cd & Hg	Each element as above	This product contains heavy metal impurities. Its use may result in accumulation of cadmium and mercury in the soil. Depending on soil characteristics, irrigation water quality, plant species and variety, crop uptake of cadmium may lead to residue levels in plant and animal products in excess of the maximum level specified by the Australia New Zealand Food Standards Code. In pasture, the offal from grazing animals may also exceed these limits.
	Pb & Hg	Each element as above	This product contains heavy metal impurities. Its use may result in accumulation of lead and mercury in the soil and may lead to residue levels in plant and animal products in excess of the maximum level specified by the Australia New Zealand Food Standards Code.
	Cd & Pb & Hg	Each element as above	This product contains heavy metal impurities. Its use may result in accumulation of cadmium, lead and mercury in the soil. Depending on soil characteristics, irrigation water quality, plant species and variety, crop uptake of cadmium may lead to residue levels in plant and animal products in excess of the maximum level specified by the Australia New Zealand Food Standards Code. In pasture, the offal from grazing animals may also exceed these limits.
Phosphatic Fertilizers (>2% P) that may be used as Stock Feed Supplements	Cd	>100mg Cd/kg P	*Add following text to above Statements:* This product should not be fed to livestock or used in stock feed mixtures.
If any fertilizer contains scheduled poisons, hazardous substances or ingredients covered by other regulation such as those managed by the Australian Pesticides and Veterinary Medicines Authority the appropriate label information required under the relevant regulation or authority should be included.			

8. Weight and Volume

8.1. For solid fertilizers the net weight of the fertilizer is to be included on the label in metric units in the format: Net weight: [the weight] [the unit of weight].

8.2. For liquid fertilizers the volume of the fertilizer in litres is to be included on the label in the format: [the volume] L.

9. Physical Description

9.1. The physical qualities of some fertilizers are important in predicting their efficacy.

9.2. Elemental sulphur, phosphate rock, and other fertilizers with low solubility in water, are to describe the particle size distribution as the **minimum** percentage by weight in the following size ranges to be determined by sieving.

- < 0.25mm
- 0.25mm to 0.50mm
- 0.50mm to 1.00mm

10. Defined Products

10.1. Blood and bone, or blood and bone based, fertilizer

10.1.1. Blood and bone fertilizer must contain at least 90% of meal containing animal blood, bone or flesh, fish or feather;

10.1.2. Blood and bone based fertilizer must contain at least 65% of meal containing animal blood, bone or flesh, fish or feather.

10.2. Other organic fertilizer

10.2.1. Organic fertilizer must contain at least 95% organic matter (matter derived from plants or animals).

10.2.2. Organically-based fertilizer must contain at least 65% organic matter (matter derived from plants or animals).

11. Contact Information

11.1. The label should include the name and Australian address of the manufacturer, importer, wholesaler or retailer.

12. Additional Information

12.1. Companies are encouraged to provide additional information that will assist users in making informed decisions about productivity, health, safety and environmental outcomes. Such additional information must not contradict or confuse any of the information required to be included on the label by this code of practice.

13. Compliance Statement

13.1. Companies are encouraged to include the following statement at the foot of the label:

> "This label complies with the National Code of Practice for Fertilizer Description and Labelling."

14. Package Size

14.1. This code of practice applies to all package sizes sold to end users.

14.2. To comply with this code of practice the maximum package size for manual handling is 25kg for solid products and 20L for liquids, effective from July 1, 2010. A twelve month transition period applies, however companies are encouraged to adopt this maximum at the earliest opportunity.

15. Custom Blends

15.1. Custom Blends must be labeled in accordance with this Code of Practice.

15.2. Alternatively, the Delivery Docket should list all the ingredients and their amount (kg or tonnes) or concentration (%) in the blend. A copy of the label Information, in accordance with this code of practice, for each ingredient should then be attached to the Delivery Docket.

16. Sampling and Analysis

16.1. To ensure collection of representative samples for analysis fertilizer should be sampled using the methods agreed by the AFPC and published by them from time to time.

16.2. Analysis of nutrient and impurity content must be conducted by a laboratory that:

16.3. Operates in accordance with the International Standard ISO/IEC 17025 General requirements for the competence of testing and calibration laboratories, e.g. NATA accreditation; and

16.4. Uses analytical techniques based on International Standards relevant to fertilizer industry, e.g. AOAC, AFPC; and

16.5. Demonstrates performance in relevant internationally recognised inter-laboratory proficiency studies, e.g. AFPC, Magruder, ILCP Labchek

17. Analytical measurement uncertainty

17.1. The best laboratories, following appropriate methods and using industry best practice still produce an estimate rather than an absolute value. Laboratory methods have an analytical measurement uncertainty known as the MU. The MU for accredited techniques can be estimated and in Australia, NATA requires laboratories to state the MU on certificates of analysis. This is stated as a 95% confidence interval.

17.2. Product tolerance (Section 0) includes an allowance for MU; measured values should therefore fall within the product tolerance range.

17.3. The impurity content of a product will comply with this code of practice if the analytical result including the MU is equal to or less than the stated MPC.

18. Appendix I Example Label

FIFA Fantastica Complete + (16-5-12-6)

Nitrogen	
Nitrate	7.8%
Ammonium	7.8%
Total Nitrogen	**15.6%**
Phosphorus	
Water Soluble	4.0%
Citrate Soluble	1.0%
Citrate Insoluble	0.1%
Total P	**5.1%**
Potassium as sulphate	**11.9%**
Sulphur as sulphate	**6.5%**
Calcium as phosphate	**3.7%**
Zinc as oxide	**2.1%**

Impurities	
Fluorine (maximum)	0.75% : 145g F/kg P
Cadmium (maximum)	5 mg/kg : 70mg Cd/kg P
Lead (maximum)	30mg/kg
Mercury (maximum)	0.6mg/kg

!! Warning Statements !!

Do not swallow. The dust from this product may act as an irritant. Avoid inhalation and contact with the eyes and skin.

This product contains fluorine as an impurity. Do not feed this product to livestock or use in stock feed mixtures. If top dressing pastures do not graze for 3 weeks or until rain or irrigation is received.

This product contains heavy metal impurities. Its use may result in accumulation of cadmium, lead and mercury in the soil. Depending on soil characteristics, irrigation water quality, plant species and variety, crop uptake of cadmium may lead to residue limits in plant and animal products in excess of the maximum level specified by the Australia New Zealand Food Standards Code. In pasture, the offal from grazing animals may also exceed these limits. Users are encouraged to seek further advice.

Manufactured by:
FIFA
Level 2, 1 Hobart Place
Canberra ACT 2601

Net weight: 25kg

This label complies with the National Code of Practice for Fertilizer Description and Labeling.