



Agricultural Agencies CC

P O Box 1372
Plettenberg bay
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Tel (044) 533 1645
Fax (044) 533 2790

MSDS – MATERIAL SAFETY DATA SHEET

LAST REVISED: **JUNE 2006**
MSDS NR:

TSAMA BOR

1. IDENTIFICATION OF THE SUBSTANCE

Product Identification: Amber Liquid
Use: Used as foliar feed and fertilisation.
UN No: Not regulated
Supplier: P O Box 1372
Plettenberg bay
6600
Tel (044) 533 1645
Fax (044) 533 2790

Emergency number: (044) – 533 1645

2. COMPOSITION/INFORMATION ON INGREDIENTS

Composition: Boron (B) 13%

3. HAZARDS IDENTIFICATION

Emergency Overview

- Harmful if inhaled
- Causes irritation to skin and respiratory tract
- Mild eye irritation

Potential Health Effects

Inhalation:

Causes irritation to the mucous membranes of the respiratory tract. May be absorbed from the mucous membranes and depending on the amount of exposure could result in the development of nausea, vomiting, diarrhoea and gastric distress.

Ingestion:

May cause mild mucus burns of the mouth.

Skin Contact:

Causes skin irritation. Not significantly absorbed through the intact skin. Readily absorbed through damaged or burned skin.

Eye Contact:

Causes mild irritation.

Chronic Exposure:

Prolonged absorption causes weight loss, vomiting, diarrhoea, skin rash, convulsions and anaemia. May cause respiratory tract irritation and coughing.

Aggravation of Pre-existing Conditions:

Persons with pre-existing skin disorders or eye problems, or impaired liver, kidney or respiratory function may be more susceptible to the substance.

4. FIRST AID MEASURES

Inhalation:

Remove to fresh air. If not breathing gives artificial respiration. If breathing is difficult, give oxygen. Do NOT give mouth-to-mouth resuscitation if victim ingested or inhaled the substance. Keep person at rest and warm. Treat symptomatically and supportively as and when required. Obtain medical advice if necessary.

Ingestion:

Have victim rinse mouth thoroughly with water. Give $\frac{1}{2}$ to one glass of water to dilute the material if victim is alert and not convulsing. Induce vomiting as directed by medical personnel. If spontaneous vomiting occurs, have victim lean forward with head down to avoid breathing in of vomits, rinse mouth and administer more water. Never give anything by mouth to an unconscious person. Qualified medical personnel should perform administration of oxygen. Seek medical advice immediately.

Skin Contact:

Remove any contaminated clothing. Wash skin with soap or mild detergent and water for at least 15 minutes. Get medical attention if irritation develops or persists. Wash clothing before re-use.

Eye Contact:

Immediately flush eyes with lukewarm water or saline solution for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

5. FIRE FIGHTING MEASURES

Fire:

Combustible. Some could burn, but none ignite readily. Containers could explode when heated. Flash Point of Ethanol Amine: 85 °C (185 °F)
Auto ignition temperature of Ethanol Amine: 410 °C (770 °F)
Flammable limits in air % by volume Ethanol Amine: lel = 5.5 and uel = 17

Fire Extinguishing Media:

Extinguish small fires with carbon dioxide, dry powder or alcohol-resistant foam. Water spray or fog can be used for larger fires or cooling of unaffected stock. Water may be used to flash spills away from exposures and to dilute spills to non-flammable mixtures.

Explosion:

Above flash point, vapour air mixtures are explosive within flammable limits noted above.

Special Information:

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full-face piece operated in the pressure demand or other positive pressure mode. Fire may produce irritating or poisonous vapours, mists or other products of combustion.

6. ACCIDENTAL RELEASE MEASURES

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8.

Small Spills: Absorb with sand or other non-combustible absorbent material and put in a suitable container for reclamation or disposal.

Large Spills: Dyke far ahead of liquid spills for later disposal. Prevent entry of the substance into waterways, sewers, basements or confined areas.

7. HANDLING AND STORAGE

Keep in tightly closed container in a shaded, well-ventilated area, away from heat, sparks and other sources of ignition. Protect against physical damage. Observe all warnings and precautions listed for the product.

Packaging: Packed in 25 l polyethylene container with inner liner and labelled according to SA regulations and guidelines.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ventilation system:

In general, dilution ventilation is a satisfactory health hazard control for this substance. However, if conditions of use create discomfort to the worker, a local exhaust system should be considered.

Skin Protection:

Wear suitable personal protective equipment including approved respiratory protection.

Hand Protection:

Wear appropriate hand gloves where necessary.

Eye Protection:

Use chemical safety goggles and/or full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Amber Liquid
Odour: Pungent Odour
Solubility: Soluble in water
Density: 1.30
pH: 8.5
Boiling Point: > 100 °C

10. STABILITY AND REACTIVITY

Stability:	Stable under ordinary conditions of use and storage. Hygroscopic. Absorbs carbon dioxide and is a strong base.
Hazardous Polymerisation:	Will not occur
Conditions to avoid:	Heat, flame and other sources of ignition.
Incompatibilities:	Acetic Anhydride, sulphuric acid, hydrochloric acid, acetic acid, carbon dioxide in the air, copper, copper alloys, galvanized iron, aluminium, acrolein, acrylic acid, acrylonitrile, chlorosulfonic acid, epichlorohydrin, hydrofluoric acid, mesityl oxide, nitric acid, oleum, beta-propiolactone and vinyl acetate.
Thermal Decomposition:	Burning may produce carbon monoxide, carbon dioxide and nitrogen oxides.

11. TOXICOLOGICAL INFORMATION

No information found

12. ECOLOGICAL INFORMATION

Environmental Fate:	No information found
Environmental Toxicity:	No information found

This section is subject to further development.

13. DISPOSAL CONSIDERATIONS

Contaminated absorbents, surplus product (in diluted form), etc., should be buried in approved landfill. Comply with any local legislation applying to waste disposal. Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Surfactants can cause foaming problems in biological wastewater treatment plants and other high shear operations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. TRANSPORT INFORMATION

Non – Hazardous

15. REGULATORY INFORMATION

EC Classification: Harmful
Risk-phrase: R20, 36/37/38
Safety phrases: S(2)

National legislation: National Road Traffic Act, 1996 (Act 93 of 1996).
Fire Brigade Service Act, 1987 (Act 99 of 1987).
Occupational Health and Safety Act, 1993 (Act 85 of 1993).

16. OTHER INFORMATION

All information and instructions provided in this Material Safety Data Sheet (MSDS) are based on the current state of scientific and technical knowledge at the date indicated on the present MSDS and are presented in good faith and believed to be correct. This information applies to the product as such. In case of new formulations or mixes, it is necessary to ascertain that a new danger will not appear.

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MSDS – MATERIAL SAFETY DATA SHEET

LAST REVISED: **JUNE 2002**
MSDS NR: TAA2

TSAMA CALCIUM

1. IDENTIFICATION OF THE SUBSTANCE

Product Identification: White suspension
Use: As a foliar application to maintain or correct calcium levels in plants.
UN No: Not regulated
Supplier: P O Box 1372
Plettenberg Bay
6600
Tel (044) 533 1645
Fax (044) 533 2790

Emergency number: (044) 533 1645

2. COMPOSITION/INFORMATION ON INGREDIENTS

COMPOSITION:	Calcium (Ca)	400 g/l
	Zinc (Zn)	30 g/l
	Boron (B)	3 g/l

3. HAZARDS IDENTIFICATION

Emergency Overview

- May be irritating to the eyes and skin
- May be irritating to the upper respiratory tract.
- May cause gastric problems if ingested in large quantities.

Potential Health Effects

Inhalation:

May cause irritation of the respiratory tract with sore throat.

Ingestion:

May be irritating to the digestive tract with symptoms such as nausea, vomiting and diarrhoea.

Skin Contact:

May cause skin irritation.

Eye Contact:

May cause eye irritation.

Chronic Exposure:

None observed where product is used under conditions of good industrial hygiene.

Aggravation of Pre-existing Conditions:

No information found.

4. FIRST AID MEASURES

Inhalation:

Remove from exposure to fresh air. If breathing is difficult, give oxygen. Do NOT use mouth-to-mouth resuscitation. Keep person at rest and warm. Obtain medical advice if necessary.

Ingestion:

Have victim rinse mouth thoroughly with water. Give $\frac{1}{2}$ to one glass of water or milk to dilute the material if victim is alert and not convulsing. Do NOT induce vomiting. If spontaneous vomiting occurs, have victim lean forward with head down to avoid breathing in of vomits, rinse mouth and administer more water. Never give anything by mouth to an unconscious person. Seek medical advice immediately.

Skin Contact:

Remove any contaminated clothing. Wash skin with soap or mild detergent and water for at least 15 minutes. Get medical attention if irritation develops or persists. Wash clothing before re-use.

Eye Contact:

Immediately flush eyes with cold water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention if necessary.

Note to Physician:

Treat symptomatically and supportively.

5. FIRE FIGHTING MEASURES

Fire:

Not considered to be a fire hazard.

Fire Extinguishing Media:

Extinguish with water spray, carbon dioxide, foam, or dry chemical. Water spray or fog can be used for larger fires or cooling of unaffected stock.

Special Information:

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full-face piece operated in the pressure demand or other positive pressure mode. Fire may produce irritating or poisonous vapours, mists or toxic gasses (e.g. potassium oxide, carbon monoxide and carbon dioxide).

6. ACCIDENTAL RELEASE MEASURES

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8.

Small Spills: Use non-combustible material like vermiculite, sand or earth to soak up the substance and put in a suitable container for reclamation or disposal.

Large Spills: Dyke far ahead of liquid spills for later disposal. Absorb spilled liquid with suitable absorbent materials. Following product recovery, flush area with water. Place all spill residues in an appropriate container and dispose of in accordance with local regulations.

7. HANDLING AND STORAGE

Handling:

Wash thoroughly after handling. Do not get in eyes, on skin or on clothing. Do not ingest or inhale. Use with adequate ventilation. Observe all warnings and precautions listed for the product.

Storage:

Keep in tightly closed container in a shaded, well-ventilated area, away from heat, sparks and other sources of ignition. Protect against physical damage and frost. Do not contaminate water, food, or feed by storage or disposal.

Packaging: Packed in high density polyethylene drums and labelled according to SA regulations and guidelines.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ventilation system:

In general, dilution ventilation is a satisfactory health hazard control for this substance. However, if conditions of use create discomfort to the worker, a local exhaust system should be considered.

Skin Protection:

Wear suitable personal protective equipment i.e. overalls, rubber gloves and boots.

Eye Protection:

Use chemical safety goggles and/or full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

Exposure Limits:

None listed

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: White suspension
Odour: Pungent odour
Solubility: Miscible with water
Density: 1.65
pH: 9 - 10
Boiling Point: > 100 °C

10. STABILITY AND REACTIVITY

Stability: Stable under normal conditions of use.
Hazardous Decomposition: Potassium oxide, carbon monoxide and carbon dioxide.
Conditions to avoid: Extreme temperatures.
Incompatibilities: Do not mix with acids or phosphorus containing fertilizers.
Hazardous Polymerisation: Has not been reported.

11. TOXICOLOGICAL INFORMATION

Oral LD₅₀ (rat) > 2 000 mg/kg (calculated)

12. ECOLOGICAL INFORMATION

Environmental Fate:

Mobility:

The product is miscible with water. Calcium is in a non-water soluble form.

Persistence and degradability:

Calcium is a fundamental inorganic nutrient and is persistent in the environment.

Ecotoxicity:

Not known. However avoid contamination of watercourses or sewage systems.

13. DISPOSAL CONSIDERATIONS

Contaminated absorbents, surplus product (in diluted form), etc., should be buried in approved landfill. Comply with any local legislation applying to waste disposal. Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to an approved waste facility. Dispose of container and unused contents in accordance with local requirements.

14. TRANSPORT INFORMATION

Non-Hazardous

15. REGULATORY INFORMATION

EC Classification:	None
Risk – Phrase:	R20 – Harmful by inhalation. R36/38 – Irritating to eyes and skin.
Safety – Phrase:	S1/2 – Keep locked up and out of reach of children. S7/9 – Keep container tightly closed in a well-ventilated area. S20 – When using, do not eat or drink.
National legislation:	National Road Traffic Act, 1996 (Act 93 of 1996). Fire Brigade Service Act, 1987 (Act 99 of 1987). Occupational Health and Safety Act, 1993 (Act 85 of 1993).

16. OTHER INFORMATION

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MSDS – MATERIAL SAFETY DATA SHEET

LAST REVISED: JUNE 2002
MSDS NR:

TSAMA Caliphos

1. IDENTIFICATION OF THE SUBSTANCE

Product Identification: Clear Yellow Green Liquid
Use: Use for the treatment of physiological storage disorders in fruit and other crops.
UN No: Not regulated
Supplier: P O Box 1372
Plettenberg bay
6600
Tel (044) 533 1645
Fax (044) 533 2790
Emergency number: (044) – 533 1645

2. COMPOSITION/INFORMATION ON INGREDIENTS

COMPOSITION:	Calcium (Ca)	40 g/l
	Phosphate (P ₂ O ₅)	310 g/l
	Phosphoric Acid	11 % w/w

3. HAZARDS IDENTIFICATION

Emergency Overview

- Can cause eye and skin burns.
- Irritating to the respiratory tract.

Potential Health Effects

Inhalation:

May cause irritation of the respiratory tract with sore throat, coughing, and shortness of breath.

Ingestion:

Irritating to the digestive tract. This may lead to coughing, nausea, vomiting and diarrhoea.

Skin Contact:

Causes skin irritation and redness.

Eye Contact:

Causes eye irritation, reddening and pain.

Chronic Exposure:

No information found.

Aggravation of Pre-existing Conditions:

No information found.

4. FIRST AID MEASURES

Inhalation:

Remove from exposure to fresh air. If not breathing gives artificial respiration using oxygen and a suitable mechanical device. If breathing is difficult, give oxygen. Do NOT use mouth-to-mouth resuscitation. Keep person at rest and warm.

Ingestion:

Have victim rinse mouth thoroughly with water. Give $\frac{1}{2}$ to one glass of water or milk to dilute the material if victim is alert and not convulsing. Do NOT induce vomiting. If spontaneous vomiting occurs, have victim lean forward with head down to avoid breathing in of vomits, rinse mouth and administer more water. Never give anything by mouth to an unconscious person. Seek medical advice immediately.

Skin Contact:

Remove any contaminated clothing. Wash skin with soap or mild detergent and water for at least 15 minutes. Get medical attention if irritation develops or persists. Wash clothing before re-use.

Eye Contact:

Immediately flush eyes with cold water for at least 15 minutes, lifting lower and upper eyelids occasionally. Do NOT allow victim to rub or keep eyes closed. Get medical attention immediately.

Note to Physician:
Treat symptomatically and supportively.

5. FIRE FIGHTING MEASURES

Fire:
Not considered to be a fire hazard.

Fire Extinguishing Media:
Extinguish with water spray, carbon dioxide, foam, and dry chemical.

Special Information:
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full-face piece operated in the pressure demand or other positive pressure mode. Fire may produce irritating or poisonous vapours, mists or toxic gasses (e.g. phosphorous oxides, phosphine, carbon monoxide, ammonia and carbon dioxide).

6. ACCIDENTAL RELEASE MEASURES

Ventilate area of leak or spill. Clear the affected area and protect people. Wear appropriate personal protective equipment as specified in Section 8.

Small Spills: Use non-combustible material like vermiculite, sand or earth to soak up the substance and put in a suitable container for reclamation or disposal.

Large Spills: Dyke far ahead of liquid spills for later disposal. Absorb spilled liquid with suitable absorbent materials. Following product recovery, flush area with water. Place all spill residues in an appropriate container and dispose of in accordance with local regulations.

7. HANDLING AND STORAGE

Handling:
Wash thoroughly after handling. Do not get in eyes, on skin or on clothing. Do not ingest or inhale. Use with adequate ventilation. Observe all warnings and precautions listed for the product.

Storage:
Keep in tightly closed container in a shaded, well-ventilated area, away from heat, sparks and other sources of ignition. Protect against physical damage. Do not contaminate water, food, or feed by storage or disposal.

Packaging: Packed in 25 l polyethylene container with inner liner and labelled according to SA regulations and guidelines.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ventilation system:

In general, dilution ventilation is a satisfactory health hazard control for this substance. However, if conditions of use create discomfort to the worker, a local exhaust system should be considered.

Skin Protection:

Wear suitable personal protective equipment i.e. overalls and boots.

Eye Protection:

Use chemical safety goggles and/or full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

Exposure Limits:

ACGIH	:	None listed
NIOSH	:	None listed
OSHA Final PEL	:	None listed
OSHA Vacated PEL	:	None listed

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Clear Yellow Green Liquid
Odour:	Pungent Odour
Solubility:	Soluble in water
Density:	1.312
pH:	1.1
Boiling Point:	> 100 °C

10. STABILITY AND REACTIVITY

Hazardous Decomposition:	Phosphine, oxides of phosphorus, carbon monoxide, ammonia and carbon dioxide.
Conditions to avoid:	Exposure to air, water or extreme temperatures.
Incompatibilities:	Strong oxidizing and reducing agents, strong bases and water reactive material.
Hazardous Polymerisation:	Has not been reported.

11. TOXICOLOGICAL INFORMATION

Oral LD₅₀ (rat) = 1 895 mg/kg

12. ECOLOGICAL INFORMATION

Environmental Fate: Phosphorous acid is rapidly degraded in the environment to yield hydrogen and phosphite ions.
Environmental Toxicity: Practically non-toxic to birds and freshwater fish. Slightly toxic to aquatic invertebrates.

13. DISPOSAL CONSIDERATIONS

Contaminated absorbents, surplus product (in diluted form), etc., should be buried in approved landfill. Comply with any local legislation applying to waste disposal. Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to an approved waste facility. Dispose of container and unused contents in accordance with local requirements.

14. TRANSPORT INFORMATION

Shipping Name: Phosphorous acid
Hazard Class: 8
UN No.: UN2834
Packaging Group: III

15. REGULATORY INFORMATION

EC Classification: Corrosive
Risk – Phrase: R20 – Harmful by inhalation
R36/38 – Irritating to eyes and skin.
Safety – Phrase: S1/2 – Keep locked up and out of reach of children.
S26 – In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S36/37/39 – Wear suitable protective clothing, gloves and eye/face protection.
National legislation: National Road Traffic Act, 1996 (Act 93 of 1996).
Fire Brigade Service Act, 1987 (Act 99 of 1987).
Occupational Health and Safety Act, 1993 (Act 85 of 1993).

16. OTHER INFORMATION

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MSDS – MATERIAL SAFETY DATA SHEET

LAST REVISED: **JUNE 2006**
MSDS NR: TAA4

TSAMA COPPER

1. IDENTIFICATION OF THE SUBSTANCE

Product Identification: Green suspension
Use: For use as a foliar application to maintain or correct copper levels in plants.
UN No: Not regulated
Supplier: P O Box 1372
Plettenberg Bay
6600
Tel (044) 533 1645
Fax (044) 533 2790

Emergency number: (044) 533 1645

2. COMPOSITION/INFORMATION ON INGREDIENTS

COMPOSITION: Copper (Cu) 500 g/l

3. HAZARDS IDENTIFICATION

Emergency Overview

- Harmful if ingested
- May be an eye and skin irritant

Potential Health Effects

Inhalation:

May be an irritant to the upper respiratory tract.

Ingestion:

Harmful if ingested.

Skin Contact:

May be a skin irritant.

Eye Contact:

May be an eye irritant.

Chronic Exposure:

None observed where product is used under conditions of good industrial hygiene.

4. FIRST AID MEASURES

Inhalation:

Remove from exposure to fresh air. If not breathing gives artificial respiration using oxygen and a suitable mechanical device. If breathing is difficult, give oxygen. Do NOT use mouth-to-mouth resuscitation. Keep person at rest and warm.

Ingestion:

Have victim rinse mouth thoroughly with water. Give $\frac{1}{2}$ to one glass of water or milk to dilute the material if victim is alert and not convulsing. Do NOT induce vomiting. If spontaneous vomiting occurs, have victim lean forward with head down to avoid breathing in of vomits, rinse mouth and administer more water. Never give anything by mouth to an unconscious person. Seek medical advice immediately.

Skin Contact:

Remove any contaminated clothing. Wash skin with soap or mild detergent and water for at least 15 minutes. Get medical attention if irritation develops or persists. Wash clothing before re-use.

Eye Contact:

Immediately flush eyes with cold water for at least 15 minutes, lifting lower and upper eyelids occasionally. Do NOT allow victim to rub or keep eyes closed. Get medical attention immediately.

Note to Physician:

Treat symptomatically and supportively.

5. FIRE FIGHTING MEASURES

Fire:

Not considered to be a fire hazard. Some could burn, but none ignite readily.

Fire Extinguishing Media:

Extinguish small fires with carbon dioxide, dry powder or alcohol-resistant foam. Water spray or fog can be used for larger fires or cooling of unaffected stock.

Special Information:

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full-face piece operated in the pressure demand or other positive pressure mode. Fire may produce irritating or poisonous vapours, mists or other products of combustion.

6. ACCIDENTAL RELEASE MEASURES

Ventilate area of leak or spill. Clear the affected area and protect people. Wear appropriate personal protective equipment as specified in Section 8.

Small Spills: Use non-combustible material like vermiculite, sand or earth to soak up the substance and put in a suitable container for reclamation or disposal.

Large Spills: Dyke far ahead of liquid spills for later disposal. Absorb spilled liquid with suitable absorbent materials. Following product recovery, flush area with water. Place all spill residues in an appropriate container and dispose of in accordance with local regulations.

7. HANDLING AND STORAGE

Handling:

Wash thoroughly after handling. Do not get in eyes, on skin or on clothing. Do not ingest or inhale. Use with adequate ventilation. Observe all warnings and precautions listed for the product.

Storage:

Keep in tightly closed container in a shaded, well-ventilated area, away from heat, sparks and other sources of ignition. Protect against physical damage. Do not contaminate water, food, or feed by storage or disposal.

Packaging: Packed in 25 l polyethylene container with inner liner and labelled according to SA regulations and guidelines.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ventilation system:

In general, dilution ventilation is a satisfactory health hazard control for this substance. However, if conditions of use create discomfort to the worker, a local exhaust system should be considered.

Respiratory Protection:

Wear a NIOSH approved respirator when handling the concentrated product.

Skin Protection:

Wear rubber boots and gloves when handling the product.

Eye Protection:

Use chemical safety goggles and/or full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Green suspension
Odour: None
Solubility: Miscible with water
Density: 1.60
pH: 9.5
Boiling Point: > 100 °C

10. STABILITY AND REACTIVITY

Stability: Stable under ordinary conditions of use and storage.
Hazardous Polymerisation: Will not occur
Conditions to avoid: Excessive heat.
Incompatibilities: Oxidising substances.
Thermal Decomposition: May produce toxic fumes if heated to decomposition.

11. TOXICOLOGICAL INFORMATION

Oral LD₅₀ (rat) 2 000 mg/kg (calculated)

12. ECOLOGICAL INFORMATION

Environmental Fate:

Mobility:

The product is miscible with water. Copper is in a non-water soluble form.

Persistence and degradability:

Copper is a fundamental inorganic nutrient and is persistent in the environment.

Ecotoxicity:

Not known. However, care should be taken not to contaminate water courses or sewage systems, as this product may be hazardous to aquatic organisms.

13. DISPOSAL CONSIDERATIONS

Contaminated absorbents, surplus product (in diluted form), etc., should be buried in approved landfill. Comply with any local legislation applying to waste disposal. Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to an approved waste facility. Processing, use or contamination of this product may change the waste management options. Surfactants can cause foaming problems in biological wastewater treatment plants and other high shear operations. Dispose of container and unused contents in accordance with local requirements.

14. TRANSPORT INFORMATION

Non - Hazardous

15. REGULATORY INFORMATION

EC Classification:	Harmful
Risk – Phrase:	R22 – Harmful if swallowed. R36/37/38 – Irritating to the eyes, respiratory system and skin.
Safety -Phrase:	S1/2 – Keep locked up and out of the reach of children. S7/9 – Keep container tightly closed and in a well-ventilated place. S15 – Keep away from heat. S20/21 – When using, do not eat, drink or smoke.
National legislation:	National Road Traffic Act, 1996 (Act 93 of 1996). Fire Brigade Service Act, 1987 (Act 99 of 1987). Occupational Health and Safety Act, 1993 (Act 85 of 1993)

16. OTHER INFORMATION

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Fax (044) 533 2790

MSDS – MATERIAL SAFETY DATA SHEET

LAST REVISED: **JUNE 2006**
MSDS NR: TAA5

TSAMA COPPER START

1. IDENTIFICATION OF THE SUBSTANCE

Product Identification: Green suspension
Use: For use as a foliar application to maintain or correct copper levels in plants.
UN No: Not regulated
Supplier: P O Box 1372
Plettenberg Bay
6600
Tel (044) 533 1645
Fax (044) 533 2790

Emergency number: (044) 533 1645

2. COMPOSITION/INFORMATION ON INGREDIENTS

COMPOSITION: Copper (Cu) 500 g/l
Ecklonia maxima 60 g/l

3. HAZARDS IDENTIFICATION

Emergency Overview

- Harmful if ingested
- May be an eye and skin irritant

Potential Health Effects

Inhalation:

May be an irritant to the upper respiratory tract.

Ingestion:

Harmful if ingested.

Skin Contact:

May be a skin irritant.

Eye Contact:

May be an eye irritant.

Chronic Exposure:

None observed where product is used under conditions of good industrial hygiene.

4. FIRST AID MEASURES

Inhalation:

Remove from exposure to fresh air. If not breathing gives artificial respiration using oxygen and a suitable mechanical device. If breathing is difficult, give oxygen. Do NOT use mouth-to-mouth resuscitation. Keep person at rest and warm.

Ingestion:

Have victim rinse mouth thoroughly with water. Give $\frac{1}{2}$ to one glass of water or milk to dilute the material if victim is alert and not convulsing. Do NOT induce vomiting. If spontaneous vomiting occurs, have victim lean forward with head down to avoid breathing in of vomits, rinse mouth and administer more water. Never give anything by mouth to an unconscious person. Seek medical advice immediately.

Skin Contact:

Remove any contaminated clothing. Wash skin with soap or mild detergent and water for at least 15 minutes. Get medical attention if irritation develops or persists. Wash clothing before re-use.

Eye Contact:

Immediately flush eyes with cold water for at least 15 minutes, lifting lower and upper eyelids occasionally. Do NOT allow victim to rub or keep eyes closed. Get medical attention immediately.

Note to Physician:

Treat symptomatically and supportively.

5. FIRE FIGHTING MEASURES

Fire:

Not considered to be a fire hazard. Some could burn, but none ignite readily.

Fire Extinguishing Media:

Extinguish small fires with carbon dioxide, dry powder or alcohol-resistant foam. Water spray or fog can be used for larger fires or cooling of unaffected stock.

Special Information:

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full-face piece operated in the pressure demand or other positive pressure mode. Fire may produce irritating or poisonous vapours, mists or other products of combustion.

6. ACCIDENTAL RELEASE MEASURES

Ventilate area of leak or spill. Clear the affected area and protect people. Wear appropriate personal protective equipment as specified in Section 8.

Small Spills: Use non-combustible material like vermiculite, sand or earth to soak up the substance and put in a suitable container for reclamation or disposal.

Large Spills: Dyke far ahead of liquid spills for later disposal. Absorb spilled liquid with suitable absorbent materials. Following product recovery, flush area with water. Place all spill residues in an appropriate container and dispose of in accordance with local regulations.

7. HANDLING AND STORAGE

Handling:

Wash thoroughly after handling. Do not get in eyes, on skin or on clothing. Do not ingest or inhale. Use with adequate ventilation. Observe all warnings and precautions listed for the product.

Storage:

Keep in tightly closed container in a shaded, well-ventilated area, away from heat, sparks and other sources of ignition. Protect against physical damage. Do not contaminate water, food, or feed by storage or disposal.

Packaging: Packed in 25 l polyethylene container with inner liner and labelled according to SA regulations and guidelines.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ventilation system:

In general, dilution ventilation is a satisfactory health hazard control for this substance. However, if conditions of use create discomfort to the worker, a local exhaust system should be considered.

Respiratory Protection:

Wear a NIOSH approved respirator when handling the concentrated product.

Skin Protection:

Wear rubber boots and gloves when handling the product.

Eye Protection:

Use chemical safety goggles and/or full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Green suspension
Odour: None
Solubility: Miscible with water
Density: 1.60
pH: 9.5
Boiling Point: > 100 °C

10. STABILITY AND REACTIVITY

Stability: Stable under ordinary conditions of use and storage.
Hazardous Polymerisation: Will not occur
Conditions to avoid: Excessive heat.
Incompatibilities: Oxidising substances.
Thermal Decomposition: May produce toxic fumes if heated to decomposition.

11. TOXICOLOGICAL INFORMATION

Oral LD₅₀ (rat) 2 000 mg/kg (calculated)

12. ECOLOGICAL INFORMATION

Environmental Fate:

Mobility:

The product is miscible with water. Copper is in a non-water soluble form.

Persistence and degradability:

Copper is a fundamental inorganic nutrient and is persistent in the environment.

Ecotoxicity:

Not known. However, care should be taken not to contaminate water courses or sewage systems, as this product may be harmful to aquatic organisms.

13. DISPOSAL CONSIDERATIONS

Contaminated absorbents, surplus product (in diluted form), etc., should be buried in approved landfill. Comply with any local legislation applying to waste disposal. Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to an approved waste facility. Processing, use or contamination of this product may change the waste management options. Surfactants can cause foaming problems in biological wastewater treatment plants and other high shear operations. Dispose of container and unused contents in accordance with local requirements.

14. TRANSPORT INFORMATION

Non - Hazardous

15. REGULATORY INFORMATION

EC Classification: Harmful
Risk – Phrase: R22 – Harmful if swallowed.
R36/37/38 – Irritating to the eyes, respiratory system and skin.
Safety -Phrase: S1/2 – Keep locked up and out of the reach of children.
S7/9 – Keep container tightly closed and in a well-ventilated place.
S15 – Keep away from heat.
S20/21 – When using, do not eat, drink or smoke.

National legislation: National Road Traffic Act, 1996 (Act 93 of 1996).
Fire Brigade Service Act, 1987 (Act 99 of 1987).
Occupational Health and Safety Act, 1993 (Act 85 of 1993)

16. OTHER INFORMATION

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MSDS – MATERIAL SAFETY DATA SHEET

LAST REVISED: **JUNE 2006**
MSDS NR: TAA6

TSAMA COPPER TRIPLE

1. IDENTIFICATION OF THE SUBSTANCE

Product Identification: Light green suspension
Use: Used as a foliar application to maintain or correct copper, manganese and zinc levels in plants.
UN No: Not regulated
Supplier: P O Box 1372
Plettenberg Bay
6600
Tel (044) 533 1645
Fax (044) 533 2790
Emergency number: (044) 533 1645

2. COMPOSITION/INFORMATION ON INGREDIENTS

COMPOSITION:	Copper	(Cu)	55 g/l
	Manganese	(Mn)	280 g/l
	Zinc	(Zn)	330 g/l

3. HAZARDS IDENTIFICATION

Emergency Overview

- May be harmful if ingested or inhaled in large quantities
- May be a skin and eye irritant

Potential Health Effects

Inhalation:

May be harmful. Inhalation of large quantities may lead to dry throat, headaches, muscle aches, cramps, sleepiness and slowness of speech.

Ingestion:

May be harmful. Symptoms include fume fever, dry throat, headaches, muscle aches, cramps, sleepiness and slowness of speech.

Skin Contact:

May be an irritant. No adverse affects known.

Eye Contact:

May cause eyes irritation.

Chronic Exposure:

None observed where product is used under conditions of good industrial hygiene.

Aggravation of Pre-existing Conditions:

No information found.

4. FIRST AID MEASURES

Inhalation:

Remove to fresh air. If not breathing gives artificial respiration. If breathing is difficult, give oxygen. Do NOT give mouth-to-mouth resuscitation if victim ingested or inhaled the substance. Keep person at rest and warm. Treat symptomatically and supportively as and when required. Obtain medical advice if necessary.

Ingestion:

Have victim rinse mouth thoroughly with water. Give $\frac{1}{2}$ to one glass of water to dilute the material if victim is alert and not convulsing. Do NOT Induce vomiting. If spontaneous vomiting occurs, have victim lean forward with head down to avoid breathing in of vomits, rinse mouth and administer more water. Never give anything by mouth to an unconscious person. Qualified medical personnel should perform administration of oxygen. Seek medical advice immediately.

Skin Contact:

Remove any contaminated clothing. Wash skin with soap or mild detergent and water for at least 15 minutes. Get medical attention if irritation develops or persists. Wash clothing before re-use.

Eye Contact:

Immediately flush eyes with lukewarm water or saline solution for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

5. FIRE FIGHTING MEASURES

Fire:

Not considered to be a fire hazard. Some could burn, but none ignite readily.

Fire Extinguishing Media:

Extinguish small fires with carbon dioxide, dry powder or alcohol-resistant foam. Water spray or fog can be used for larger fires or cooling of unaffected stock.

Special Information:

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full-face piece operated in the pressure demand or other positive pressure mode. Fire may produce irritating or poisonous vapours, mists or other products of combustion.

6. ACCIDENTAL RELEASE MEASURES

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8.

Small Spills: Absorb with sand or other non-combustible absorbent material and put in a suitable container for reclamation or disposal.

Large Spills: Dyke far ahead of liquid spills for later disposal. Absorb spilled liquid with suitable absorbent materials. Following product recovery, flush area with water. Place all spill residues in an appropriate container and dispose of in accordance with local regulations. Prevent entry of the substance into waterways, sewers, basements or confined areas.

7. HANDLING AND STORAGE

Handling:

Wear appropriate personal protective equipment as specified in Section 8. Observe all warnings and precautions listed for the product.

Storage:

Keep in tightly closed container in a shaded, well-ventilated area, away from heat, sparks and other sources of ignition. Protect against physical damage and frost.

Packaging: Packed in high density polyethylene (HDPE) container labelled according to SA regulations and guidelines.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ventilation system:

In general, dilution ventilation is a satisfactory health hazard control for this substance. However, if conditions of use create discomfort to the worker, a local exhaust system should be considered.

Respiratory Protection:

Wear a mist-type respirator when handling and applying the product.

Skin Protection:

Wear PVC or rubber gloves and boots when handling the product.

Eye Protection:

Use chemical safety goggles and/or full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Light green suspension
Odour: None
Solubility: Miscible with water
Density: 1.85
pH: 8.3
Boiling Point: > 100 °C

10. STABILITY AND REACTIVITY

Stability: Stable under normal conditions of use and storage.
Hazardous Polymerisation: Will not occur
Conditions to avoid: Extreme temperatures
Incompatibilities: Acids and oxidizing material.
Thermal Decomposition: Not known.

11. TOXICOLOGICAL INFORMATION

No information found.

12. ECOLOGICAL INFORMATION

Environmental Fate:

Mobility:

The product is miscible with water. Copper, manganese and zinc are in a non-water soluble form.

Persistence and degradability:

Copper, manganese and zinc are fundamental inorganic nutrients and are persistent in the environment.

Ecotoxicity:

Not known. However, care should be taken not to contaminate water courses or sewage systems, as this product may be harmful to aquatic organisms.

13. DISPOSAL CONSIDERATIONS

Contaminated absorbents, surplus product (in diluted form), etc., should be buried in approved landfill. Comply with any local legislation applying to waste disposal. Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to an approved waste facility. Processing, use or contamination of this product may change the waste management options. Surfactants can cause foaming problems in biological wastewater treatment plants and other high shear operations. Dispose of container and unused contents in accordance with local requirements.

14. TRANSPORT INFORMATION

Non – Hazardous

15. REGULATORY INFORMATION

EC Classification: None
Risk – Phrase: R22 – Harmful if swallowed.
R36/37/38 – Irritating to the eyes, respiratory system and skin.
Safety -Phrase: S1/2 – Keep locked up and out of the reach of children.
S7/9 – Keep container tightly closed and in a well-ventilated place.
S15 – Keep away from heat.
S20/21 – When using, do not eat, drink or smoke.
National legislation: National Road Traffic Act, 1996 (Act 93 of 1996).
Fire Brigade Service Act, 1987 (Act 99 of 1987).
Occupational Health and Safety Act, 1993 (Act 85 of 1993).

16. OTHER INFORMATION

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MSDS – MATERIAL SAFETY DATA SHEET

LAST REVISED: **JUNE 2006**
MSDS NR: TAA7

TSAMA IRON 60

1. IDENTIFICATION OF THE SUBSTANCE

Product Identification: Red/brown granule
Use: Used as a soil application to treat iron chlorosis of plants and trees.
UN No: Not regulated
Supplier: Tsama Agricultural Agencies cc.
P O Box 1372
Plettenberg Bay
6600
Tel (044) 533 1645
Fax (044) 533 2790

Emergency number: (044) 533 1645

2. COMPOSITION/INFORMATION ON INGREDIENTS

Composition: Iron (Fe) 6% (w/w) as EDDHA Chelate

3. HAZARDS IDENTIFICATION

Emergency Overview

- May be irritating to eyes and skin.
- May be harmful if ingested in large quantities.

Potential Health Effects

Inhalation:

May be an irritant to the respiratory tract.

Ingestion:

May be harmful if ingested in large quantities.

Skin Contact:

May be irritating to the skin. Not toxic by skin absorption.

Eye Contact:

May be irritating to the eyes.

Chronic Exposure:

None observed where product is used under conditions of good industrial hygiene.

Aggravation of Pre-existing Conditions:

Not known.

4. FIRST AID MEASURES

Inhalation:

Remove to fresh air. If breathing is difficult, give oxygen. Keep person at rest and warm. Treat symptomatically and supportively as and when required. Obtain medical advice if necessary.

Ingestion:

Have victim rinse mouth thoroughly with water. Give $\frac{1}{2}$ to one glass of water to dilute the material if victim is alert and not convulsing. Induce vomiting as directed by medical personnel. If spontaneous vomiting occurs, have victim lean forward with head down to avoid breathing in of vomits, rinse mouth and administer more water. Never give anything by mouth to an unconscious person. Qualified medical personnel should perform administration of oxygen. Seek medical advice immediately.

Skin Contact:

Remove any contaminated clothing. Wash skin with soap or mild detergent and water for at least 15 minutes. Get medical attention if irritation develops or persists. Wash clothing before re-use.

Eye Contact:

Immediately flush eyes with lukewarm water or saline solution for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

5. FIRE FIGHTING MEASURES

Fire:

Not flammable. Combustion may occur if heated to decomposition.

Fire Extinguishing Media:

Extinguish fires with carbon dioxide, dry powder or water spray. Water jet is not recommended. Water may be used to flash spills away from exposures and to dilute spills to non-flammable mixtures.

Special Information:

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full-face piece operated in the pressure demand or other positive pressure mode. Fire may produce irritating or poisonous vapours, mists or other products of combustion. Contaminated water should be prevented from spreading uncontrollably.

6. ACCIDENTAL RELEASE MEASURES

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8.

Absorb with sand or other non-combustible absorbent material and put in a suitable container for reclamation or disposal. Wash area well with water and soda, soap or detergent. Collect wash water in plastic containers, and avoid contamination of waterways, sewers, basements or confined areas. Dispose of in accordance with local regulations.

7. HANDLING AND STORAGE

Handling:

Wear appropriate personal protective equipment as specified in Section 8. Observe all warnings and precautions listed for the product.

Storage:

Keep in tightly closed container in a shaded, well-ventilated area, away from heat, sparks and other sources of ignition. Store in a cool, dry area free from frost. Protect against physical damage.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ventilation system:

In general, dilution ventilation is a satisfactory health hazard control for this substance. However, if conditions of use create discomfort to the worker, a local exhaust system should be considered.

Respiratory Protection:

Wear a dust mask when handling the product.

Skin Protection:

Wear PVC or rubber gloves when handling the product.

Eye Protection:

Use chemical safety goggles. Maintain eye wash fountain and quick-drench facilities in work area.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Red/brown granule
Odour: Odourless
Solubility: Soluble in water
Density: N/a
pH: 8.0 (1% solution)
Melting Point: 100 °C

10. STABILITY AND REACTIVITY

Stability: Stable under normal conditions of use and storage.
Conditions to avoid: Extreme temperatures.
Incompatibilities: Strong acids or alkalis.
Thermal Decomposition: May produce oxides of nitrogen if heated to decomposition.

11. TOXICOLOGICAL INFORMATION

Oral LD₅₀ (rat): > 2 000 mg/kg (calculated)

12. ECOLOGICAL INFORMATION

Environmental Fate:

Mobility:

The product is soluble in water and aquatically mobile.

Persistence and degradability:

The product may be broken down at pH extremes, but the iron and EDDHA are persistent in the environment.

Ecotoxicity:

Not known. However, care should be taken not to contaminate water courses or sewage systems, as this product may be hazardous to aquatic organisms.

13. DISPOSAL CONSIDERATIONS

Contaminated absorbents, surplus product (in diluted form), etc., should be incinerated or buried at an approved landfill site. Comply with any local legislation applying to waste disposal. Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to an approved waste facility. Dispose of container and unused contents in accordance with local requirements.

14. TRANSPORT INFORMATION

Non – Hazardous

15. REGULATORY INFORMATION

EC Classification:	None
Risk-phrase:	R22 – Harmful if swallowed. R36/37/38 – Irritating to eyes, respiratory system and skin.
Safety phrases:	S1/2 – Keep locked up out of reach of children. S3 – Keep in a cool place. S7/9 – Keep container tightly closed in a well-ventilated place.
National legislation:	National Road Traffic Act, 1996 (Act 93 of 1996). Fire Brigade Service Act, 1987 (Act 99 of 1987). Occupational Health and Safety Act, 1993 (Act 85 of 1993).

16. OTHER INFORMATION

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MSDS – MATERIAL SAFETY DATA SHEET

LAST REVISED: **JUNE 2002**
MSDS NR: TAA8

TSAMA MAGNESIUM

1. IDENTIFICATION OF THE SUBSTANCE

Product Identification: White suspension
Use: Used as a foliar application to maintain or correct magnesium levels in plants.
UN No: Not regulated
Supplier: P O Box 1372
Plettenberg Bay
6600
Tel (044) 533 1645
Fax (044) 533 2790
Emergency number: (044) 533 1645

2. COMPOSITION/INFORMATION ON INGREDIENTS

COMPOSITION: Magnesium (Mg) 300 g/l

3. HAZARDS IDENTIFICATION

Emergency Overview

- Causes mild eye and skin irritation.
- Mildly harmful if swallowed.

Potential Health Effects

Inhalation:

Not harmful if inhaled.

Ingestion:

Mildly harmful if swallowed.

Skin Contact:

Causes mild skin irritation.

Eye Contact:

Causes mild irritation to eyes.

Chronic Exposure:

None observed where product is used under conditions of good industrial hygiene.

Aggravation of Pre-existing Conditions:

No information found.

4. FIRST AID MEASURES

Inhalation:

Remove from exposure to fresh air. If breathing is difficult, give oxygen. Do NOT use mouth-to-mouth resuscitation. Keep person at rest and warm. Obtain medical advice if necessary.

Ingestion:

Have victim rinse mouth thoroughly with water. Give $\frac{1}{2}$ to one glass of water or milk to dilute the material if victim is alert and not convulsing. Do NOT induce vomiting. If spontaneous vomiting occurs, have victim lean forward with head down to avoid breathing in of vomits, rinse mouth and administer more water. Never give anything by mouth to an unconscious person. Seek medical advice immediately.

Skin Contact:

Remove any contaminated clothing. Wash skin with soap or mild detergent and water for at least 15 minutes. Get medical attention if irritation develops or persists. Wash clothing before re-use.

Eye Contact:

Immediately flush eyes with cold water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention if necessary.

Note to Physician:

Treat symptomatically and supportively.

5. FIRE FIGHTING MEASURES

Fire:

Not considered to be a fire hazard. Some could burn, but none ignite readily.

Fire Extinguishing Media:

Extinguish with water spray, carbon dioxide, foam, or dry chemical. Water spray or fog can be used for larger fires or cooling of unaffected stock.

Special Information:

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full-face piece operated in the pressure demand or other positive pressure mode. Fire may produce irritating or poisonous vapours, mists or toxic gasses (e.g. carbon monoxide and carbon dioxide).

6. ACCIDENTAL RELEASE MEASURES

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8.

Small Spills: Use non-combustible material like vermiculite, sand or earth to soak up the substance and put in a suitable container for reclamation or disposal.

Large Spills: Dyke far ahead of liquid spills for later disposal. Absorb spilled liquid with suitable absorbent materials. Following product recovery, flush area with water. Place all spill residues in an appropriate container and dispose of in accordance with local regulations.

7. HANDLING AND STORAGE

Handling:

Wash thoroughly after handling. Do not get in eyes, on skin or on clothing. Do not ingest or inhale. Use with adequate ventilation. Observe all warnings and precautions listed for the product.

Storage:

Keep in tightly closed container in a shaded, well-ventilated area, away from heat, sparks and other sources of ignition. Protect against physical damage and frost. Do not contaminate water, food, or feed by storage or disposal.

Packaging: Packed in high density polyethylene drums and labelled according to SA regulations and guidelines.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ventilation system:

In general, dilution ventilation is a satisfactory health hazard control for this substance. However, if conditions of use create discomfort to the worker, a local exhaust system should be considered.

Skin Protection:

Wear suitable personal protective equipment i.e. overalls, rubber gloves and boots.

Eye Protection:

Use chemical safety goggles and/or full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

Exposure Limits:

None listed

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: White suspension
Odour: Pungent odour
Solubility: Miscible with water
Density: 1.40
pH: 11.6
Boiling Point: > 100 °C

10. STABILITY AND REACTIVITY

Stability: Stable under normal conditions of use.
Hazardous Decomposition: Carbon monoxide and carbon dioxide.
Conditions to avoid: Extreme temperatures.
Incompatibilities: Do not mix with oxidizing materials or phosphorus containing fertilizers.
Hazardous Polymerisation: Will not occur.

11. TOXICOLOGICAL INFORMATION

Oral LD₅₀ (rat) > 2 000 mg/kg (calculated)

12. ECOLOGICAL INFORMATION

Environmental Fate:

Mobility:

The product is miscible with water. Magnesium is in a non-water soluble form.

Persistence and degradability:

Magnesium is a fundamental inorganic nutrient and is persistent in the environment.

Ecotoxicity:

Not known. However avoid contamination of watercourses or sewage systems.

13. DISPOSAL CONSIDERATIONS

Contaminated absorbents, surplus product (in diluted form), etc., should be buried in approved landfill. Comply with any local legislation applying to waste disposal. Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to an approved waste facility. Dispose of container and unused contents in accordance with local requirements.

14. TRANSPORT INFORMATION

Non-Hazardous

15. REGULATORY INFORMATION

EC Classification:	None
Risk – Phrase:	R22 – Harmful if swallowed. R36/38 – Irritating to eyes and skin.
Safety – Phrase:	S1/2 – Keep locked up and out of reach of children. S7/9 – Keep container tightly closed in a well-ventilated area. S20 – When using, do not eat or drink.
National legislation:	National Road Traffic Act, 1996 (Act 93 of 1996). Fire Brigade Service Act, 1987 (Act 99 of 1987). Occupational Health and Safety Act, 1993 (Act 85 of 1993).

16. OTHER INFORMATION

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MSDS – MATERIAL SAFETY DATA SHEET

LAST REVISED: **JANUARY 2008**
MSDS NR: TAA18

TSAMA MIX

1. IDENTIFICATION OF THE SUBSTANCE

Product Identification: Blue/green powder
Use: A trace element mixture for foliar application, fertigation or pivot application.
UN No: Not regulated
Supplier: P O Box 1372
Plettenberg Bay
6600
Tel (044) 533 1645
Fax (044) 533 2790

Emergency number: (044) 533 1645

2. COMPOSITION/INFORMATION ON INGREDIENTS

COMPOSITION:	*Zinc	(Zn)	50 g/kg
	*Copper	(Cu)	20 g/kg
	*Iron	(Fe)	25 g/kg
	*Manganese	(Mn)	70 g/kg
	Boron	(B)	20 g/kg
	Molybdenum	(Mo)	1 g/kg

*EDTA Chelated

3. HAZARDS IDENTIFICATION

Emergency Overview

- May cause mild eye and skin irritation.
- Mildly harmful if excessive quantities have been ingested.

Potential Health Effects

Inhalation:

Not harmful if inhaled.

Ingestion:

Mildly harmful if ingested.

Skin Contact:

Causes mild skin irritation. Not significantly absorbed through the intact skin.

Eye Contact:

Causes mild irritation to eyes.

Chronic Exposure:

None observed where product is used under conditions of good industrial hygiene.

Aggravation of Pre-existing Conditions:

No information found.

4. FIRST AID MEASURES

Inhalation:

Remove from exposure to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen. Keep person at rest and warm. Treat symptomatically and supportively as and when required. Obtain medical advice if necessary.

Ingestion:

Have victim rinse mouth thoroughly with water. Give $\frac{1}{2}$ to one glass of water or milk to dilute the material if victim is alert and not convulsing. Do NOT induce vomiting. If spontaneous vomiting occurs, have victim lean forward with head down to avoid breathing in of vomits, rinse mouth and administer more water. Never give anything by mouth to an unconscious person. Seek medical advice immediately.

Skin Contact:

Remove any contaminated clothing. Wash skin with soap or mild detergent and water for at least 15 minutes. Get medical attention if irritation develops or persists. Wash clothing before re-use.

Eye Contact:

Immediately flush eyes with cold water for at least 15 minutes, lifting lower and upper eyelids occasionally. Do NOT allow victim to rub or keep eyes closed. Get medical attention immediately.

Note to Physician:

Treat symptomatically and supportively.

5. FIRE FIGHTING MEASURES

Fire:

Not considered to be a fire hazard.

Fire Extinguishing Media:

Extinguish with water spray, carbon dioxide, foam, and dry chemical.

Special Information:

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full-face piece operated in the pressure demand or other positive pressure mode. Fire may produce irritating or poisonous vapours, mists or toxic gasses.

6. ACCIDENTAL RELEASE MEASURES

Ventilate area of spill. Avoid breathing dust. Clear the affected area and protect people. Wear appropriate personal protective equipment as specified in Section 8.

Small Spills: Wash away with plenty of water. Do not contaminate waterways, sewers basements or confined areas.

Large Spills: Pick up and place in a suitable container for reclamation or disposal, using a method that does not generate dust. Following product recovery, flush area with water. Do not contaminate waterways, sewers, basements or confined areas. Place all spill residues in an appropriate container and dispose of in accordance with local regulations.

7. HANDLING AND STORAGE

Handling:

Wash thoroughly after handling. Do not get in eyes, on skin or on clothing. Do not ingest or inhale. Use with adequate ventilation. Observe all warnings and precautions listed for the product.

Storage:

Keep in tightly closed container in a shaded, well-ventilated area, away from heat, sparks and other sources of ignition. Protect against physical damage and frost. Do not contaminate water, food, or feed by storage or disposal.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ventilation system:

In general, dilution ventilation is a satisfactory health hazard control for this substance. However, if conditions of use create discomfort to the worker, a local exhaust system should be considered.

Skin Protection:

Wear suitable personal protective equipment i.e. overalls, rubber gloves and boots.

Eye Protection:

Use chemical safety goggles and/or full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

Respiratory:

It is recommended that a dust mask must be worn when handling this product.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state: Powder
Colour: Blue/green
Odour: None
Solubility: Soluble in water
pH (5% soln): 6.5
Boiling Point: > 100 °C

10. STABILITY AND REACTIVITY

Stability: Stable under ordinary conditions of use and storage.
Conditions to avoid: High humidity and long term exposure to air.
Incompatibilities: None known.
Hazardous Polymerisation: Will not occur.
Thermal Decomposition: Toxic fumes (oxides of sulphur and manganese) are released when the product decomposes on heating.

11. TOXICOLOGICAL INFORMATION

No information found.

12. ECOLOGICAL INFORMATION

Environmental Fate: All nutrients present are found in nature and are persistent.
Environmental Toxicity: The product is water soluble and thus aquatically mobile. High concentrations in watercourses may be injurious to aquatic life.

13. DISPOSAL CONSIDERATIONS

Contaminated absorbents, surplus product (in diluted form), etc., should be buried in approved landfill. Comply with any local legislation applying to waste disposal. Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to an approved waste facility. Dispose of container and unused contents in accordance with local requirements.

14. TRANSPORT INFORMATION

Non-Hazardous

15. REGULATORY INFORMATION

EC Classification: No information found.

National legislation: National Road Traffic Act, 1996 (Act 93 of 1996).
Fire Brigade Service Act, 1987 (Act 99 of 1987).
Occupational Health and Safety Act, 1993 (Act 85 of 1993).

16. OTHER INFORMATION

All information and instructions provided in this Material Safety Data Sheet (MSDS) are based on the current state of scientific and technical knowledge at the date indicated on the present MSDS and are presented in good faith and believed to be correct. This information applies to the product as such. In case of new formulations or mixes, it is necessary to ascertain that a new danger will not appear.

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MSDS – MATERIAL SAFETY DATA SHEET

LAST REVISED: **APRIL 2008**
MSDS NR: TAA14

TSAMA MOLY-P START

1. IDENTIFICATION OF THE SUBSTANCE

Product Identification: Clear pink liquid
Use: Used as a seed treatment
UN No: Not regulated
Supplier: P O Box 1372
Plettenberg Bay
6600
Tel (044) 533 1645
Fax (044) 533 2790

Emergency number: (044) 533 1645

2. COMPOSITION/INFORMATION ON INGREDIENTS

COMPOSITION:	Phosphorus (P)	109 g/l
	Molybdenum (Mo)	250 g/l

3. HAZARDS IDENTIFICATION

Emergency Overview

- May be irritating to the eyes and skin
- May be harmful if ingested in large quantities.

Potential Health Effects

Inhalation:

Not harmful if inhaled.

Ingestion:

May be irritating to the digestive tract with symptoms such as nausea, vomiting and diarrhoea if ingested in large quantities.

Skin Contact:

May cause skin irritation.

Eye Contact:

May cause eye irritation.

Chronic Exposure:

None observed where product is used under conditions of good industrial hygiene.

Aggravation of Pre-existing Conditions:

No information found.

4. FIRST AID MEASURES

Inhalation:

Remove from exposure to fresh air. If breathing is difficult, give oxygen. Keep person at rest and warm. Obtain medical advice if necessary.

Ingestion:

Have victim rinse mouth thoroughly with water. Give $\frac{1}{2}$ to one glass of water or milk to dilute the material if victim is alert and not convulsing. Do not induce vomiting. If spontaneous vomiting occurs, have victim lean forward with head down to avoid breathing in of vomits, rinse mouth and administer more water. Never give anything by mouth to an unconscious person. Seek medical advice immediately.

Skin Contact:

Remove any contaminated clothing. Wash skin with soap or mild detergent and water for at least 15 minutes. Get medical attention if irritation develops or persists. Wash clothing before re-use.

Eye Contact:

Immediately flush eyes with cold water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention if necessary.

Note to Physician:

Treat symptomatically and supportively.

5. FIRE FIGHTING MEASURES

Fire:

Not considered to be a fire hazard.

Fire Extinguishing Media:

Extinguish with water spray, carbon dioxide, foam, or dry chemical. Water spray or fog can be used for larger fires or cooling of unaffected stock.

Special Information:

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full-face piece operated in the pressure demand or other positive pressure mode. Fire may produce irritating or poisonous vapours, mists or toxic gasses (e.g. phosphorus pentoxide).

6. ACCIDENTAL RELEASE MEASURES

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8.

Small Spills: Neutralise all spills with a base such as soda ash. Use non-combustible material like vermiculite, sand or earth to soak up the substance and put in a suitable container for reclamation or disposal.

Large Spills: Dyke far ahead of liquid spills for later disposal. Absorb spilled liquid with suitable absorbent materials. Following product recovery, flush area with water. Do not allow spilled product or wash water to enter sewers or watercourses. Place all spill residues in an appropriate container and dispose of in accordance with local regulations.

7. HANDLING AND STORAGE

Handling:

Wash thoroughly after handling. Do not get in eyes, on skin or on clothing. Do not ingest. Use with adequate ventilation. Observe all warnings and precautions listed for the product.

Storage:

Keep in tightly closed container in a shaded, well-ventilated area, away from heat, sparks and other sources of ignition. Protect against physical damage and frost. Do not contaminate water, food, or feed by storage or disposal.

Packaging: Packed in high density polyethylene drums and labelled according to SA regulations and guidelines.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ventilation system:

In general, dilution ventilation is a satisfactory health hazard control for this substance. However, if conditions of use create discomfort to the worker, a local exhaust system should be considered.

Skin Protection:

Wear suitable personal protective equipment i.e. overalls, rubber gloves and boots.

Eye Protection:

Use chemical safety goggles and/or full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Clear pink liquid
Odour: None
Solubility: Miscible with water
Density: 1.60
pH: 3.8
Boiling Point: > 100 °C

10. STABILITY AND REACTIVITY

Stability: Stable under normal conditions of use.
Hazardous Decomposition: Phosphorus pentoxide.
Conditions to avoid: Extreme temperatures.
Incompatibilities: Do not mix with bases (e.g. caustic soda), chlorates or nitrates, Keep away from metals (mild steel, tinned or galvanized materials, cast iron, aluminium alloys, brasses), cotton, wool or leather.
Hazardous Polymerisation: Has not been reported.

11. TOXICOLOGICAL INFORMATION

Oral LD₅₀ (rat) > 2 000 mg/kg (calculated)

12. ECOLOGICAL INFORMATION

Environmental Fate:

Mobility:

The product is readily soluble and therefore aquatically mobile.

Persistence and degradability:

Phosphate and molybdenum are fundamental inorganic nutrients and are persistent in the environment.

Ecotoxicity:

Not known. However high concentrations in watercourses may be toxic to aquatic life.

13. DISPOSAL CONSIDERATIONS

Contaminated absorbents, surplus product (in diluted form), etc., should be buried in approved landfill. Comply with any local legislation applying to waste disposal. Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to an approved waste facility. Dispose of container and unused contents in accordance with local requirements.

14. TRANSPORT INFORMATION

Non-Hazardous

15. REGULATORY INFORMATION

EC Classification: None
Risk – Phrase: R36/38 – Irritating to eyes and skin.
Safety – Phrase: S1/2 – Keep locked up and out of reach of children.
S26 – In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S36/37/39 – Wear suitable protective clothing, gloves and eye/face protection.

National legislation: National Road Traffic Act, 1996 (Act 93 of 1996).
Fire Brigade Service Act, 1987 (Act 99 of 1987).
Occupational Health and Safety Act, 1993 (Act 85 of 1993).

16. OTHER INFORMATION

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MSDS – MATERIAL SAFETY DATA SHEET

LAST REVISED: **JANUARY 2008**
MSDS NR: TAA11

TSAMA PENTA S

1. IDENTIFICATION OF THE SUBSTANCE

Product Identification: White powder
Use: A macro- and micro element fertilizer as a foliar application.
UN No: Not regulated
Supplier: P O Box 1372
Plettenberg Bay
6600
Tel (044) 533 1645
Fax (044) 533 2790

Emergency number: (044) 533 1645

2. COMPOSITION/INFORMATION ON INGREDIENTS

COMPOSITION:	Boron	(B)	51 g/kg
	Manganese	(Mn)	70 g/kg
	Molybdenum	(Mo)	2 g/kg
	Magnesium	(Mg)	87 g/kg
	Sulfur	(S)	145 g/kg

3. HAZARDS IDENTIFICATION

Emergency Overview

- May cause mild eye and skin irritation.
- Mildly harmful if excessive quantities have been ingested.

Potential Health Effects

Inhalation:

Not harmful if inhaled.

Ingestion:

Mildly harmful if ingested.

Skin Contact:

Causes mild skin irritation. Not significantly absorbed through the intact skin.

Eye Contact:

Causes mild irritation to eyes.

Chronic Exposure:

None observed where product is used under conditions of good industrial hygiene.

Aggravation of Pre-existing Conditions:

No information found.

4. FIRST AID MEASURES

Inhalation:

Remove from exposure to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen. Keep person at rest and warm. Treat symptomatically and supportively as and when required. Obtain medical advice if necessary.

Ingestion:

Have victim rinse mouth thoroughly with water. Give $\frac{1}{2}$ to one glass of water or milk to dilute the material if victim is alert and not convulsing. Do NOT induce vomiting. If spontaneous vomiting occurs, have victim lean forward with head down to avoid breathing in of vomits, rinse mouth and administer more water. Never give anything by mouth to an unconscious person. Seek medical advice immediately.

Skin Contact:

Remove any contaminated clothing. Wash skin with soap or mild detergent and water for at least 15 minutes. Get medical attention if irritation develops or persists. Wash clothing before re-use.

Eye Contact:

Immediately flush eyes with cold water for at least 15 minutes, lifting lower and upper eyelids occasionally. Do NOT allow victim to rub or keep eyes closed. Get medical attention immediately.

Note to Physician:

Treat symptomatically and supportively.

5. FIRE FIGHTING MEASURES

Fire:

Not considered to be a fire hazard.

Fire Extinguishing Media:

Extinguish with water spray, carbon dioxide, foam, and dry chemical.

Special Information:

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full-face piece operated in the pressure demand or other positive pressure mode. Fire may produce irritating or poisonous vapours, mists or toxic gasses.

6. ACCIDENTAL RELEASE MEASURES

Ventilate area of spill. Avoid breathing dust. Clear the affected area and protect people. Wear appropriate personal protective equipment as specified in Section 8.

Small Spills: Wash away with plenty of water. Do not contaminate waterways, sewers basements or confined areas.

Large Spills: Pick up and place in a suitable container for reclamation or disposal, using a method that does not generate dust. Following product recovery, flush area with water. Do not contaminate waterways, sewers, basements or confined areas. Place all spill residues in an appropriate container and dispose of in accordance with local regulations.

7. HANDLING AND STORAGE

Handling:

Wash thoroughly after handling. Do not get in eyes, on skin or on clothing. Do not ingest or inhale. Use with adequate ventilation. Observe all warnings and precautions listed for the product.

Storage:

Keep in tightly closed container in a shaded, well-ventilated area, away from heat, sparks and other sources of ignition. Protect against physical damage and frost. Do not contaminate water, food, or feed by storage or disposal.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ventilation system:

In general, dilution ventilation is a satisfactory health hazard control for this substance. However, if conditions of use create discomfort to the worker, a local exhaust system should be considered.

Skin Protection:

Wear suitable personal protective equipment i.e. overalls, rubber gloves and boots.

Eye Protection:

Use chemical safety goggles and/or full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

Respiratory:

It is recommended that a dust mask must be worn when handling this product.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state: Powder
Colour: White
Odour: None
Solubility: Soluble in water
pH (5% soln): 8
Boiling Point: > 100 °C

10. STABILITY AND REACTIVITY

Stability: Stable under ordinary conditions of use and storage.
Conditions to avoid: High humidity and long term exposure to air.
Incompatibilities: None known.
Hazardous Polymerisation: Will not occur.
Thermal Decomposition: Toxic fumes (oxides of sulphur and manganese) are released when the product decomposes on heating.

11. TOXICOLOGICAL INFORMATION

No information found.

12. ECOLOGICAL INFORMATION

Environmental Fate: All nutrients present are found in nature and are persistent.
Environmental Toxicity: The product is water soluble and thus aquatically mobile. High concentrations in watercourses may be injurious to aquatic life.

13. DISPOSAL CONSIDERATIONS

Contaminated absorbents, surplus product (in diluted form), etc., should be buried in approved landfill. Comply with any local legislation applying to waste disposal. Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to an approved waste facility. Dispose of container and unused contents in accordance with local requirements.

14. TRANSPORT INFORMATION

Non-Hazardous

15. REGULATORY INFORMATION

EC Classification: No information found.

National legislation: National Road Traffic Act, 1996 (Act 93 of 1996).
Fire Brigade Service Act, 1987 (Act 99 of 1987).
Occupational Health and Safety Act, 1993 (Act 85 of 1993).

16. OTHER INFORMATION

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MSDS – MATERIAL SAFETY DATA SHEET

LAST REVISED: JUNE 2006
MSDS NR:

TSAMA Mn

1. IDENTIFICATION OF THE SUBSTANCE

Product Identification: White Suspension

Use: Used as foliar feed and fertilisation.

UN No: Not regulated

Supplier: P O Box 1372
Plettenberg bay
6600
Tel (044) 533 1645
Fax (044) 533 2790

Emergency number: (044) – 533 1645

2. COMPOSITION/INFORMATION ON INGREDIENTS

COMPOSITION: Manganese (Mn) 43 %

3. HAZARDS IDENTIFICATION

Emergency Overview

- Causes mild eye and skin irritation
- Mildly harmful if swallowed

Potential Health Effects

Inhalation:

Not harmful if inhaled.

Ingestion:

Mildly harmful if swallowed.

Skin Contact:

Causes mild skin irritation. Not significantly absorbed through the intact skin.

Eye Contact:

Causes mild irritation to eyes.

Chronic Exposure:

No information found.

Aggravation of Pre-existing Conditions:

No information found.

4. FIRST AID MEASURES

Inhalation:

Remove to fresh air. If not breathing gives artificial respiration. If breathing is difficult, give oxygen. Do NOT give mouth-to-mouth resuscitation if victim ingested or inhaled the substance. Keep person at rest and warm. Treat symptomatically and supportively as and when required. Obtain medical advice if necessary.

Ingestion:

Have victim rinse mouth thoroughly with water. Give $\frac{1}{2}$ to one glass of water to dilute the material if victim is alert and not convulsing. Induce vomiting as directed by medical personnel. If spontaneous vomiting occurs, have victim lean forward with head down to avoid breathing in of vomits, rinse mouth and administer more water. Never give anything by mouth to an unconscious person. Qualified medical personnel should perform administration of oxygen. Seek medical advice immediately.

Skin Contact:

Remove any contaminated clothing. Wash skin with soap or mild detergent and water for at least 15 minutes. Get medical attention if irritation develops or persists. Wash clothing before re-use.

Eye Contact:

Immediately flush eyes with lukewarm water or saline solution for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

5. FIRE FIGHTING MEASURES

Fire:

Not considered to be a fire hazard. Some could burn, but none ignite readily. Containers could explode when heated.

Fire Extinguishing Media:

Extinguish small fires with carbon dioxide, dry powder or alcohol-resistant foam. Water spray or fog can be used for larger fires or cooling of unaffected stock.

Special Information:

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full-face piece operated in the pressure demand or other positive pressure mode. Fire may produce irritating or poisonous vapours, mists or other products of combustion.

6. ACCIDENTAL RELEASE MEASURES

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8.

Small Spills: Absorb with sand or other non-combustible absorbent material and put in a suitable container for reclamation or disposal.

Large Spills: Dyke far ahead of liquid spills for later disposal. Prevent entry of the substance into waterways, sewers, basements or confined areas.

7. HANDLING AND STORAGE

Keep in tightly closed container in a shaded, well-ventilated area, away from heat, sparks and other sources of ignition. Protect against physical damage. Observe all warnings and precautions listed for the product.

Packaging: Packed in 25 l polyethylene container with inner liner and labelled according to SA regulations and guidelines.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ventilation system:

In general, dilution ventilation is a satisfactory health hazard control for this substance. However, if conditions of use create discomfort to the worker, a local exhaust system should be considered.

Skin Protection:

Wear suitable personal protective equipment including approved respiratory protection.

Hand Protection:

Wear appropriate hand gloves where necessary.

Eye Protection:

Use chemical safety goggles and/or full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: White Suspension

Odour: Pungent Odour

Solubility: Soluble in water

Density: 1.65

pH: Not available

Boiling Point: > 100 °C

10. STABILITY AND REACTIVITY

Stability: Stable under ordinary conditions of use and storage.

Hazardous Polymerisation: Will not occur

Conditions to avoid: No information found

Incompatibilities: Tsama Mn is compatible with the majority of agricultural remedies. It is however advisable to do a miscibility test prior to mixing with other chemicals. Do not mix physically, mix concentrate directly with other herbicides or pesticides concentrates: always dilute first. Do not mix Tsama Mn with oxidizing materials or with any phosphate containing fertilizer.

Thermal Decomposition: Carbon dioxide, carbon monoxide and water may form when heated to decomposition.

Thermal Decomposition: Burning may produce carbon monoxide, carbon dioxide and nitrogen oxides.

11. TOXICOLOGICAL INFORMATION

No information found

12. ECOLOGICAL INFORMATION

Environmental Fate: No information found
Environmental Toxicity: No information found

This section is subject to further development.

13. DISPOSAL CONSIDERATIONS

Contaminated absorbents, surplus product (in diluted form), etc., should be buried in approved landfill. Comply with any local legislation applying to waste disposal. Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Surfactants can cause foaming problems in biological wastewater treatment plants and other high shear operations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. TRANSPORT INFORMATION

Non – Hazardous

15. REGULATORY INFORMATION

EC Classification: No information found

National legislation: National Road Traffic Act, 1996 (Act 93 of 1996).
Fire Brigade Service Act, 1987 (Act 99 of 1987).
Occupational Health and Safety Act, 1993 (Act 85 of 1993).

16. OTHER INFORMATION

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MSDS – MATERIAL SAFETY DATA SHEET

LAST REVISED: **JUNE 2006**
MSDS NR: TAA10

TSAMA MN START

1. IDENTIFICATION OF THE SUBSTANCE

Product Identification: Amber suspension
Use: As a foliar application to maintain or correct manganese levels in plants.
UN No: Not regulated
Supplier: P O Box 1372
Plettenberg Bay
6600
Tel (044) 533 1645
Fax (044) 533 2790
Emergency number: (044) 533 1645

2. COMPOSITION/INFORMATION ON INGREDIENTS

COMPOSITION:	Manganese (Mn)	400 g/l
	<i>Ecklonia maxima</i>	60 g/l

3. HAZARDS IDENTIFICATION

Emergency Overview

- Causes mild eye and skin irritation
- May be harmful if swallowed or inhaled in large quantities

Potential Health Effects

Inhalation:

May be harmful if inhaled in large quantities. Symptoms include dry throat, headache, muscle aches and cramps, sleepiness and slowness of speech.

Ingestion:

May be harmful if swallowed in large quantities. Symptoms include dry throat, headache, muscle aches and cramps, sleepiness and slowness of speech.

Skin Contact:

May be a skin irritant.

Eye Contact:

May be an eye irritant.

Chronic Exposure:

None observed where product is used under conditions of good industrial hygiene.

Aggravation of Pre-existing Conditions:

No information found.

4. FIRST AID MEASURES

Inhalation:

Remove to fresh air. If not breathing gives artificial respiration. If breathing is difficult, give oxygen. Do NOT give mouth-to-mouth resuscitation if victim ingested or inhaled the substance. Keep person at rest and warm. Treat symptomatically and supportively as and when required. Obtain medical advice if necessary.

Ingestion:

Have victim rinse mouth thoroughly with water. Give $\frac{1}{2}$ to one glass of water to dilute the material if victim is alert and not convulsing. Induce vomiting as directed by medical personnel. If spontaneous vomiting occurs, have victim lean forward with head down to avoid breathing in of vomits, rinse mouth and administer more water. Never give anything by mouth to an unconscious person. Seek medical advice immediately.

Skin Contact:

Remove any contaminated clothing. Wash skin with soap or mild detergent and water for at least 15 minutes. Get medical attention if irritation develops or persists. Wash clothing before re-use.

Eye Contact:

Immediately flush eyes with lukewarm water or saline solution for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

5. FIRE FIGHTING MEASURES

Fire:

Not considered to be a fire hazard. Some could burn, but none ignite readily.

Fire Extinguishing Media:

Extinguish small fires with carbon dioxide, dry powder or alcohol-resistant foam. Water spray or fog can be used for larger fires or cooling of unaffected stock.

Special Information:

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full-face piece operated in the pressure demand or other positive pressure mode. Fire may produce irritating or poisonous vapours, mists or other products of combustion.

6. ACCIDENTAL RELEASE MEASURES

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8.

Small Spills: Absorb with sand or other non-combustible absorbent material and put in a suitable container for reclamation or disposal.

Large Spills: Dyke far ahead of liquid spills for later disposal. . Absorb spilled liquid with suitable absorbent materials. Following product recovery, flush area with water. Place all spill residues in an appropriate container and dispose of in accordance with local regulations. Prevent entry of the substance into waterways, sewers, basements or confined areas.

7. HANDLING AND STORAGE

Handling:

Wear appropriate personal protective equipment as specified in Section 8. Observe all warnings and precautions listed for the product.

Storage:

Keep in tightly closed container in a shaded, well-ventilated area, away from heat, sparks and other sources of ignition. Protect against physical damage and frost.

Packaging: Packed in 25 l high density polyethylene container and labelled according to SA regulations and guidelines.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ventilation system:

In general, dilution ventilation is a satisfactory health hazard control for this substance. However, if conditions of use create discomfort to the worker, a local exhaust system should be considered.

Respiratory Protection:

Wear a mist-type respirator when handling and applying the product.

Skin Protection:

Wear PVC or rubber gloves and boots when handling the product.

Eye Protection:

Use chemical safety goggles and/or full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Amber suspension
Odour: Pungent odour
Solubility: Soluble in water
Density: 1.60
pH: 8.5
Boiling Point: > 100 °C

10. STABILITY AND REACTIVITY

Stability: Stable under normal conditions of use and storage.
Hazardous Polymerisation: Will not occur
Conditions to avoid: Extreme temperatures
Incompatibilities: Do not mix Tsama Mn Start with acids or with any phosphorus containing fertilizers.
Thermal Decomposition: May produce manganese fumes if heated to decomposition (> 200 °C).

11. TOXICOLOGICAL INFORMATION

No information found

12. ECOLOGICAL INFORMATION

Environmental Fate:

Mobility:

The product is miscible with water. Manganese is in a non-water soluble form.

Persistence and degradability:

Manganese is a fundamental inorganic nutrient and is persistent in the environment.

Ecotoxicity:

Not known. However, care should be taken not to contaminate water courses or sewage systems, as this product may be hazardous to aquatic organisms.

13. DISPOSAL CONSIDERATIONS

Contaminated absorbents, surplus product (in diluted form), etc., should be buried in approved landfill. Comply with any local legislation applying to waste disposal. Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to an approved waste facility. Processing, use or contamination of this product may change the waste management options. Surfactants can cause foaming problems in biological wastewater treatment plants and other high shear operations. Dispose of container and unused contents in accordance with local requirements.

14. TRANSPORT INFORMATION

Non – Hazardous

15. REGULATORY INFORMATION

EC Classification: Harmful
Risk – Phrase: R20/22 – Harmful by inhalation and if swallowed.
R36/37/38 – Irritating to the eyes, respiratory system and skin.
Safety -Phrase: S1/2 – Keep locked up and out of the reach of children.
S7/9 – Keep container tightly closed and in a well-ventilated place.
S15 – Keep away from heat.
S20/21 – When using, do not eat, drink or smoke.

National legislation: National Road Traffic Act, 1996 (Act 93 of 1996).
Fire Brigade Service Act, 1987 (Act 99 of 1987).
Occupational Health and Safety Act, 1993 (Act 85 of 1993).

16. OTHER INFORMATION

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MSDS – MATERIAL SAFETY DATA SHEET

LAST REVISED: JUNE 2006
MSDS NR:

TSAMA Pitstop

1. IDENTIFICATION OF THE SUBSTANCE

Product Identification: Clear Green Liquid
Use: Use for the treatment of calcium related disorders in fruit and other crops.
UN No: Not regulated
Supplier: P O Box 1372
Plettenberg bay
6600
Tel (044) 533 1645
Fax (044) 533 2790
Emergency number: (044) – 533 1645

2. COMPOSITION/INFORMATION ON INGREDIENTS

COMPOSITION: Calcium (Ca) 160 g/l

3. HAZARDS IDENTIFICATION

Emergency Overview

- Causes eye and skin irritation
- Mildly harmful if swallowed

Potential Health Effects

Inhalation:

May cause irritation to the upper respiratory tract.

Ingestion:

May cause nausea and vomiting but with low oral toxicity.

Skin Contact:

Causes skin irritation. Not significantly absorbed through the intact skin.

Eye Contact:

Causes irritation to eyes and possible transient corneal.

Chronic Exposure:

No information found.

Aggravation of Pre-existing Conditions:

No information found.

4. FIRST AID MEASURES

Inhalation:

Remove to fresh air. If not breathing gives artificial respiration. If breathing is difficult, give oxygen. Do NOT give mouth-to-mouth resuscitation if victim ingested or inhaled the substance. Keep person at rest and warm. Treat symptomatically and supportively as and when required. Obtain medical advice if necessary.

Ingestion:

Have victim rinse mouth thoroughly with water. Give $\frac{1}{2}$ to one glass of water to dilute the material if victim is alert and not convulsing. Induce vomiting as directed by medical personnel. If spontaneous vomiting occurs, have victim lean forward with head down to avoid breathing in of vomits, rinse mouth and administer more water. Never give anything by mouth to an unconscious person. Qualified medical personnel should perform administration of oxygen. Seek medical advice immediately.

Skin Contact:

Remove any contaminated clothing. Wash skin with soap or mild detergent and water for at least 15 minutes. Get medical attention if irritation develops or persists. Wash clothing before re-use.

Eye Contact:

Immediately flush eyes with lukewarm water or saline solution for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

5. FIRE FIGHTING MEASURES

Fire:

Not considered to be a fire hazard. Some could burn, but none ignite readily. Containers could explode when heated.

Fire Extinguishing Media:

Extinguish small fires with carbon dioxide, dry powder or alcohol-resistant foam. Water spray or fog can be used for larger fires or cooling of unaffected stock.

Special Information:

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full-face piece operated in the pressure demand or other positive pressure mode. Fire may produce irritating or poisonous vapours, mists or other products of combustion.

6. ACCIDENTAL RELEASE MEASURES

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8.

Small Spills: Absorb with sand or other non-combustible absorbent material and put in a suitable container for reclamation or disposal.

Large Spills: Dyke far ahead of liquid spills for later disposal. Prevent entry of the substance into waterways, sewers, basements or confined areas.

7. HANDLING AND STORAGE

Keep in tightly closed container in a shaded, well-ventilated area, away from heat, sparks and other sources of ignition. Protect against physical damage. Observe all warnings and precautions listed for the product.

Packaging: Packed in 25 l polyethylene container with inner liner and labelled according to SA regulations and guidelines.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ventilation system:

In general, dilution ventilation is a satisfactory health hazard control for this substance. However, if conditions of use create discomfort to the worker, a local exhaust system should be considered.

Skin Protection:

Wear suitable personal protective equipment including approved respiratory protection.

Hand Protection:

Wear appropriate hand gloves where necessary.

Eye Protection:

Use chemical safety goggles and/or full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Clear Green Liquid

Odour: Pungent Odour

Solubility: Soluble in water

Density: 1.327

pH: 9.8

Boiling Point: > 100 °C

10. STABILITY AND REACTIVITY

Stability: Stable under ordinary conditions of use and storage.

Hazardous Polymerisation: Will not occur

Conditions to avoid: No information found

Incompatibilities: Tsama Pitstop is compatible with the majority of agricultural remedies. It is however advisable to do a miscibility test prior to mixing with other chemicals. Do not mix physically, mix concentrate directly with other herbicides or pesticides concentrates: always dilute first. Do not mix Tsama Pitstop with oxidizing materials or with any phosphate containing fertilizer.

Thermal Decomposition: Carbon dioxide, carbon monoxide, potassium oxide and water may form when heated to decomposition.

11. TOXICOLOGICAL INFORMATION

No information found

12. ECOLOGICAL INFORMATION

Environmental Fate: No information found
Environmental Toxicity: No information found

This section is subject to further development.

13. DISPOSAL CONSIDERATIONS

Contaminated absorbents, surplus product (in diluted form), etc., should be buried in approved landfill. Comply with any local legislation applying to waste disposal. Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Surfactants can cause foaming problems in biological wastewater treatment plants and other high shear operations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. TRANSPORT INFORMATION

Non – Hazardous

15. REGULATORY INFORMATION

EC Classification: No information found

National legislation: National Road Traffic Act, 1996 (Act 93 of 1996).
Fire Brigade Service Act, 1987 (Act 99 of 1987).
Occupational Health and Safety Act, 1993 (Act 85 of 1993).

16. OTHER INFORMATION

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MSDS – MATERIAL SAFETY DATA SHEET

LAST REVISED: **JUNE 2008**
MSDS NR: TAA12

TSAMA PLENTY K

1. IDENTIFICATION OF THE SUBSTANCE

Product Identification: Green liquid
Use: A potassium fertilizer for use as a foliar application.
UN No: Not regulated
Supplier: P O Box 1372
Plettenberg Bay
6600
Tel (044) 533 1645
Fax (044) 533 2790

Emergency number: (044) 533 1645

2. COMPOSITION/INFORMATION ON INGREDIENTS

COMPOSITION: Potassium (K) 276 g/l

3. HAZARDS IDENTIFICATION

Emergency Overview

- May cause mild eye and skin irritation.
- Mildly harmful if excessive quantities have been ingested.

Potential Health Effects

Inhalation:

Not harmful if inhaled.

Ingestion:

Mildly harmful if excessive quantities have been ingested.

Skin Contact:

Causes mild skin irritation. Not significantly absorbed through the intact skin.

Eye Contact:

Causes mild irritation to eyes.

Chronic Exposure:

None observed where product is used under conditions of good industrial hygiene.

Aggravation of Pre-existing Conditions:

No information found.

4. FIRST AID MEASURES

Inhalation:

Remove from exposure to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen. Keep person at rest and warm. Treat symptomatically and supportively as and when required. Obtain medical advice if necessary.

Ingestion:

Have victim rinse mouth thoroughly with water. Give $\frac{1}{2}$ to one glass of water or milk to dilute the material if victim is alert and not convulsing. Do not induce vomiting. If spontaneous vomiting occurs, have victim lean forward with head down to avoid breathing in of vomits, rinse mouth and administer more water. Never give anything by mouth to an unconscious person. Seek medical advice immediately.

Skin Contact:

Remove any contaminated clothing. Wash skin with soap or mild detergent and water for at least 15 minutes. Get medical attention if irritation develops or persists. Wash clothing before re-use.

Eye Contact:

Immediately flush eyes with cold water for at least 15 minutes, lifting lower and upper eyelids occasionally. Do not allow victim to rub or keep eyes closed. Get medical if necessary.

Note to Physician:

Treat symptomatically and supportively.

5. FIRE FIGHTING MEASURES

Fire:

Not considered to be a fire hazard.

Fire Extinguishing Media:

Extinguish with water spray, carbon dioxide, foam, and dry chemical.

Special Information:

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full-face piece operated in the pressure demand or other positive pressure mode. Fire may produce irritating or poisonous vapours, mists or toxic gasses.

6. ACCIDENTAL RELEASE MEASURES

Ventilate area of spill. Avoid breathing dust. Clear the affected area and protect people. Wear appropriate personal protective equipment as specified in Section 8.

Small Spills: Wash away with plenty of water. Do not contaminate waterways, sewers basements or confined areas.

Large Spills: Absorb with sand or other non-combustible absorbent material. Pick up and place in a suitable container for reclamation or disposal. Flush area with water following product recovery. Do not contaminate waterways, sewers, basements or confined areas. Dispose of in accordance with local regulations.

7. HANDLING AND STORAGE

Handling:

Wash thoroughly after handling. Do not get in eyes, on skin or on clothing. Do not ingest or inhale. Use with adequate ventilation. Observe all warnings and precautions listed for the product.

Storage:

Keep in tightly closed container in a shaded, well-ventilated area, away from heat, sparks and other sources of ignition. Protect against physical damage and frost. Do not contaminate water, food, or feed by storage or disposal.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ventilation system:

In general, dilution ventilation is a satisfactory health hazard control for this substance. However, if conditions of use create discomfort to the worker, a local exhaust system should be considered.

Skin Protection:

Wear suitable personal protective equipment i.e. overalls, rubber gloves and boots.

Eye Protection:

Use chemical safety goggles and/or full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

Respiratory:

Under conditions of extreme exposure, it is recommended that a NIOSH-approved self-contained breathing apparatus must be worn.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state: Liquid
Colour: Green
Odour: Pungent
Solubility: Soluble in water
Density: 1.3
pH: 5.5
Boiling Point: > 100 °C

10. STABILITY AND REACTIVITY

Stability: Stable under ordinary conditions of use and storage.
Conditions to avoid: No information found.
Incompatibilities: None known.
Hazardous Polymerisation: Will not occur.
Thermal Decomposition: May produce carbon oxide and contained metal.

11. TOXICOLOGICAL INFORMATION

No information found.

12. ECOLOGICAL INFORMATION

Environmental Fate: All nutrients present are found in nature and are persistent.
Environmental Toxicity: The product is water soluble and thus aquatically mobile. High concentrations in watercourses may be injurious to aquatic life.

13. DISPOSAL CONSIDERATIONS

Contaminated absorbents, surplus product (in diluted form), etc., should be buried in approved landfill. Comply with any local legislation applying to waste disposal. Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to an approved waste facility. Dispose of container and unused contents in accordance with local requirements.

14. TRANSPORT INFORMATION

Non-Hazardous

15. REGULATORY INFORMATION

EC Classification: No information found.

National legislation: National Road Traffic Act, 1996 (Act 93 of 1996).
Fire Brigade Service Act, 1987 (Act 99 of 1987).
Occupational Health and Safety Act, 1993 (Act 85 of 1993).

16. OTHER INFORMATION

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MSDS – MATERIAL SAFETY DATA SHEET

LAST REVISED: **JUNE 2006**
MSDS NR: TAA15

TSAMA ZINC

1. IDENTIFICATION OF THE SUBSTANCE

Product Identification: White suspension
Use: Used as a foliar application to maintain or correct zinc levels in plants.
UN No: Not regulated
Supplier: P O Box 1372
Plettenberg Bay
6600
Tel (044) 533 1645
Fax (044) 533 2790
Emergency number: (044) 533 1645

2. COMPOSITION/INFORMATION ON INGREDIENTS

COMPOSITION: Zinc (Zn) 700 g/l

3. HAZARDS IDENTIFICATION

Emergency Overview

- May cause eye and respiratory tract irritation
- Mildly harmful if swallowed

Potential Health Effects

Inhalation:

May be a respiratory tract irritant.

Ingestion:

Ingestion of large quantities may lead to nausea, fever and stomach cramps.

Skin Contact:

Not toxic by skin absorption. No adverse effects known.

Eye Contact:

May cause eyes irritation.

Chronic Exposure:

None observed where product is used under conditions of good industrial hygiene.

Aggravation of Pre-existing Conditions:

No information found.

4. FIRST AID MEASURES

Inhalation:

Remove to fresh air. If not breathing gives artificial respiration. If breathing is difficult, give oxygen. Do NOT give mouth-to-mouth resuscitation if victim ingested or inhaled the substance. Keep person at rest and warm. Treat symptomatically and supportively as and when required. Obtain medical advice if necessary.

Ingestion:

Have victim rinse mouth thoroughly with water. Give $\frac{1}{2}$ to one glass of water to dilute the material if victim is alert and not convulsing. Induce vomiting as directed by medical personnel. If spontaneous vomiting occurs, have victim lean forward with head down to avoid breathing in of vomits, rinse mouth and administer more water. Never give anything by mouth to an unconscious person. Qualified medical personnel should perform administration of oxygen. Seek medical advice immediately.

Skin Contact:

Remove any contaminated clothing. Wash skin with soap or mild detergent and water for at least 15 minutes. Get medical attention if irritation develops or persists. Wash clothing before re-use.

Eye Contact:

Immediately flush eyes with lukewarm water or saline solution for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

5. FIRE FIGHTING MEASURES

Fire:

Not considered to be a fire hazard. Some could burn, but none ignite readily.

Fire Extinguishing Media:

Extinguish small fires with carbon dioxide, dry powder or alcohol-resistant foam. Water spray or fog can be used for larger fires or cooling of unaffected stock.

Special Information:

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full-face piece operated in the pressure demand or other positive pressure mode. Fire may produce irritating or poisonous vapours, mists or other products of combustion.

6. ACCIDENTAL RELEASE MEASURES

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8.

Small Spills: Absorb with sand or other non-combustible absorbent material and put in a suitable container for reclamation or disposal.

Large Spills: Dyke far ahead of liquid spills for later disposal. Absorb spilled liquid with suitable absorbent materials. Following product recovery, flush area with water. Place all spill residues in an appropriate container and dispose of in accordance with local regulations. Prevent entry of the substance into waterways, sewers, basements or confined areas.

7. HANDLING AND STORAGE

Handling:

Wear appropriate personal protective equipment as specified in Section 8. Observe all warnings and precautions listed for the product.

Storage:

Keep in tightly closed container in a shaded, well-ventilated area, away from heat, sparks and other sources of ignition. Protect against physical damage and frost.

Packaging: Packed in 25 l high density polyethylene container labelled according to SA regulations and guidelines.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ventilation system:

In general, dilution ventilation is a satisfactory health hazard control for this substance. However, if conditions of use create discomfort to the worker, a local exhaust system should be considered.

Respiratory Protection:

Wear a mist-type respirator when handling and applying the product.

Skin Protection:

Wear PVC or rubber gloves and boots when handling the product.

Eye Protection:

Use chemical safety goggles and/or full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: White suspension
Odour: Pungent odour
Solubility: Miscible with water
Density: 1.76
pH: 9.1
Boiling Point: > 100 °C

10. STABILITY AND REACTIVITY

Stability: Stable under normal conditions of use and storage.
Hazardous Polymerisation: Will not occur
Conditions to avoid: Extreme temperatures
Incompatibilities: Do not mix Tsama Zinc with any phosphorus containing fertilizers.
Thermal Decomposition: Not known.

11. TOXICOLOGICAL INFORMATION

Oral LD₅₀ (rat) > 2 000 mg/kg (calculated)

12. ECOLOGICAL INFORMATION

Environmental Fate:

Mobility:

The product is miscible with water. Zinc is in a non-water soluble form.

Persistence and degradability:

Zinc is a fundamental inorganic nutrient and is persistent in the environment.

Ecotoxicity:

Not known. However, care should be taken not to contaminate water courses or sewage systems, as this product may be hazardous to aquatic organisms.

13. DISPOSAL CONSIDERATIONS

Contaminated absorbents, surplus product (in diluted form), etc., should be buried in approved landfill. Comply with any local legislation applying to waste disposal. Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to an approved waste facility. Processing, use or contamination of this product may change the waste management options. Surfactants can cause foaming problems in biological wastewater treatment plants and other high shear operations. Dispose of container and unused contents in accordance with local requirements.

14. TRANSPORT INFORMATION

Non – Hazardous

15. REGULATORY INFORMATION

EC Classification: None
Risk – Phrase: R22 – Harmful if swallowed.
R36/37/38 – Irritating to the eyes, respiratory system and skin.
Safety -Phrase: S1/2 – Keep locked up and out of the reach of children.
S7/9 – Keep container tightly closed and in a well-ventilated place.
S15 – Keep away from heat.
S20/21 – When using, do not eat, drink or smoke.
National legislation: National Road Traffic Act, 1996 (Act 93 of 1996).
Fire Brigade Service Act, 1987 (Act 99 of 1987).
Occupational Health and Safety Act, 1993 (Act 85 of 1993).

16. OTHER INFORMATION

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MSDS – MATERIAL SAFETY DATA SHEET

LAST REVISED: **JUNE 2006**
MSDS NR: TAA16

TSAMA ZINC START

1. IDENTIFICATION OF THE SUBSTANCE

Product Identification: White suspension
Use: Used as a foliar application to maintain or correct zinc levels in plants.
UN No: Not regulated
Supplier: P O Box 1372
Plettenberg Bay
6600
Tel (044) 533 1645
Fax (044) 533 2790
Emergency number: (044) 533 1645

2. COMPOSITION/INFORMATION ON INGREDIENTS

COMPOSITION:	Phosphorus (P)	84 g/l
	Zinc (Zn)	263 g/l
	Molybdenum (Mo)	5.5 g/l
	<i>Ecklonia maxima</i>	60 g/l

3. HAZARDS IDENTIFICATION

Emergency Overview

- May cause eye and respiratory tract irritation
- Mildly harmful if swallowed

Potential Health Effects

Inhalation:

May be a respiratory tract irritant.

Ingestion:

Ingestion of large quantities may lead to nausea, fever and stomach cramps.

Skin Contact:

Not toxic by skin absorption. No adverse effects known.

Eye Contact:

May cause eyes irritation.

Chronic Exposure:

None observed where product is used under conditions of good industrial hygiene.

Aggravation of Pre-existing Conditions:

No information found.

4. FIRST AID MEASURES

Inhalation:

Remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen. Do NOT give mouth-to-mouth resuscitation if victim ingested or inhaled the substance. Keep person at rest and warm. Treat symptomatically and supportively as and when required. Obtain medical advice if necessary.

Ingestion:

Have victim rinse mouth thoroughly with water. Give $\frac{1}{2}$ to one glass of water to dilute the material if victim is alert and not convulsing. Induce vomiting as directed by medical personnel. If spontaneous vomiting occurs, have victim lean forward with head down to avoid breathing in of vomits, rinse mouth and administer more water. Never give anything by mouth to an unconscious person. Qualified medical personnel should perform administration of oxygen. Seek medical advice immediately.

Skin Contact:

Remove any contaminated clothing. Wash skin with soap or mild detergent and water for at least 15 minutes. Get medical attention if irritation develops or persists. Wash clothing before re-use.

Eye Contact:

Immediately flush eyes with lukewarm water or saline solution for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

5. FIRE FIGHTING MEASURES

Fire:

Not considered to be a fire hazard. Some could burn, but none ignite readily.

Fire Extinguishing Media:

Extinguish small fires with carbon dioxide, dry powder or alcohol-resistant foam. Water spray or fog can be used for larger fires or cooling of unaffected stock.

Special Information:

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full-face piece operated in the pressure demand or other positive pressure mode. Fire may produce irritating or poisonous vapours, mists or other products of combustion.

6. ACCIDENTAL RELEASE MEASURES

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8.

Small Spills: Absorb with sand or other non-combustible absorbent material and put in a suitable container for reclamation or disposal.

Large Spills: Dyke far ahead of liquid spills for later disposal. Absorb spilled liquid with suitable absorbent materials. Following product recovery, flush area with water. Place all spill residues in an appropriate container and dispose of in accordance with local regulations. Prevent entry of the substance into waterways, sewers, basements or confined areas.

7. HANDLING AND STORAGE

Handling:

Wear appropriate personal protective equipment as specified in Section 8. Observe all warnings and precautions listed for the product.

Storage:

Keep in tightly closed container in a shaded, well-ventilated area, away from heat, sparks and other sources of ignition. Protect against physical damage and frost.

Packaging: Packed in 25 l high density polyethylene container labelled according to SA regulations and guidelines.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ventilation system:

In general, dilution ventilation is a satisfactory health hazard control for this substance. However, if conditions of use create discomfort to the worker, a local exhaust system should be considered.

Respiratory Protection:

Wear a mist-type respirator when handling and applying the product.

Skin Protection:

Wear PVC or rubber gloves and boots when handling the product.

Eye Protection:

Use chemical safety goggles and/or full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: White suspension
Odour: Pungent odour
Solubility: Miscible with water
Density: 1.40
pH: 9.3
Boiling Point: > 100 °C

10. STABILITY AND REACTIVITY

Stability: Stable under normal conditions of use and storage.
Hazardous Polymerisation: Will not occur
Conditions to avoid: Extreme temperatures
Incompatibilities: Do not mix Tsama Zinc Start with any phosphorus containing fertilizers.
Thermal Decomposition: Not known.

11. TOXICOLOGICAL INFORMATION

Oral LD₅₀ (rat) > 2 000 mg/kg (calculated)

12. ECOLOGICAL INFORMATION

Environmental Fate:

Mobility:

The product is miscible with water. Zinc is in a non-water soluble form.

Persistence and degradability:

Zinc is a fundamental inorganic nutrient and is persistent in the environment.

Ecotoxicity:

Not known. However, care should be taken not to contaminate water courses or sewage systems, as this product may be hazardous to aquatic organisms.

13. DISPOSAL CONSIDERATIONS

Contaminated absorbents, surplus product (in diluted form), etc., should be buried in approved landfill. Comply with any local legislation applying to waste disposal. Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to an approved waste facility. Processing, use or contamination of this product may change the waste management options. Surfactants can cause foaming problems in biological wastewater treatment plants and other high shear operations. Dispose of container and unused contents in accordance with local requirements.

14. TRANSPORT INFORMATION

Non – Hazardous

15. REGULATORY INFORMATION

EC Classification: None
Risk – Phrase: R22 – Harmful if swallowed.
R36/37/38 – Irritating to the eyes, respiratory system and skin.
Safety -Phrase: S1/2 – Keep locked up and out of the reach of children.
S7/9 – Keep container tightly closed and in a well-ventilated place.
S15 – Keep away from heat.
S20/21 – When using, do not eat, drink or smoke.
National legislation: National Road Traffic Act, 1996 (Act 93 of 1996).
Fire Brigade Service Act, 1987 (Act 99 of 1987).
Occupational Health and Safety Act, 1993 (Act 85 of 1993).

16. OTHER INFORMATION

All information and instructions provided in this Material Safety Data Sheet (MSDS) are based on the current state of scientific and technical knowledge at the date indicated on the present MSDS and are presented in good faith and believed to be correct. This information applies to the product as such. In case of new formulations or mixes, it is necessary to ascertain that a new danger will not appear.

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MSDS – MATERIAL SAFETY DATA SHEET

LAST REVISED: **JUNE 2006**
MSDS NR: TAA17

TSAMA ZINC TRIPLE

1. IDENTIFICATION OF THE SUBSTANCE

Product Identification: Green suspension
Use: Used as a foliar application to maintain or correct zinc, manganese and copper levels in plants.
UN No: Not regulated
Supplier: P O Box 1372
Plettenberg Bay
6600
Tel (044) 533 1645
Fax (044) 533 2790
Emergency number: (044) 533 1645

2. COMPOSITION/INFORMATION ON INGREDIENTS

COMPOSITION:	Zinc	(Zn)	55 g/l
	Copper	(Cu)	175 g/l
	Manganese	(Mn)	340 g/l

3. HAZARDS IDENTIFICATION

Emergency Overview

- May be harmful if ingested or inhaled in large quantities
- May be a skin and eye irritant

Potential Health Effects

Inhalation:

May be harmful. Inhalation of large quantities may lead to dry throat, headaches, muscle aches, cramps, sleepiness and slowness of speech.

Ingestion:

May be harmful. Symptoms include fume fever, dry throat, headaches, muscle aches, cramps, sleepiness and slowness of speech.

Skin Contact:

May be an irritant. No adverse affects known.

Eye Contact:

May cause eyes irritation.

Chronic Exposure:

None observed where product is used under conditions of good industrial hygiene.

Aggravation of Pre-existing Conditions:

No information found.

4. FIRST AID MEASURES

Inhalation:

Remove to fresh air. If not breathing gives artificial respiration. If breathing is difficult, give oxygen. Do NOT give mouth-to-mouth resuscitation if victim ingested or inhaled the substance. Keep person at rest and warm. Treat symptomatically and supportively as and when required. Obtain medical advice if necessary.

Ingestion:

Have victim rinse mouth thoroughly with water. Give $\frac{1}{2}$ to one glass of water to dilute the material if victim is alert and not convulsing. Do NOT Induce vomiting. If spontaneous vomiting occurs, have victim lean forward with head down to avoid breathing in of vomits, rinse mouth and administer more water. Never give anything by mouth to an unconscious person. Qualified medical personnel should perform administration of oxygen. Seek medical advice immediately.

Skin Contact:

Remove any contaminated clothing. Wash skin with soap or mild detergent and water for at least 15 minutes. Get medical attention if irritation develops or persists. Wash clothing before re-use.

Eye Contact:

Immediately flush eyes with lukewarm water or saline solution for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

5. FIRE FIGHTING MEASURES

Fire:

Not considered to be a fire hazard. Some could burn, but none ignite readily.

Fire Extinguishing Media:

Extinguish small fires with carbon dioxide, dry powder or alcohol-resistant foam. Water spray or fog can be used for larger fires or cooling of unaffected stock.

Special Information:

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full-face piece operated in the pressure demand or other positive pressure mode. Fire may produce irritating or poisonous vapours, mists or other products of combustion.

6. ACCIDENTAL RELEASE MEASURES

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8.

Small Spills: Absorb with sand or other non-combustible absorbent material and put in a suitable container for reclamation or disposal.

Large Spills: Dyke far ahead of liquid spills for later disposal. Absorb spilled liquid with suitable absorbent materials. Following product recovery, flush area with water. Place all spill residues in an appropriate container and dispose of in accordance with local regulations. Prevent entry of the substance into waterways, sewers, basements or confined areas.

7. HANDLING AND STORAGE

Handling:

Wear appropriate personal protective equipment as specified in Section 8. Observe all warnings and precautions listed for the product.

Storage:

Keep in tightly closed container in a shaded, well-ventilated area, away from heat, sparks and other sources of ignition. Protect against physical damage and frost.

Packaging: Packed in high density polyethylene (HDPE) container labelled according to SA regulations and guidelines.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ventilation system:

In general, dilution ventilation is a satisfactory health hazard control for this substance. However, if conditions of use create discomfort to the worker, a local exhaust system should be considered.

Respiratory Protection:

Wear a mist-type respirator when handling and applying the product.

Skin Protection:

Wear PVC or rubber gloves and boots when handling the product.

Eye Protection:

Use chemical safety goggles and/or full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Green suspension
Odour: None
Solubility: Miscible with water
Density: 1.85
pH: 8.1
Boiling Point: > 100 °C

10. STABILITY AND REACTIVITY

Stability: Stable under normal conditions of use and storage.
Hazardous Polymerisation: Will not occur
Conditions to avoid: Extreme temperatures
Incompatibilities: Acids and oxidizing material.
Thermal Decomposition: Not known.

11. TOXICOLOGICAL INFORMATION

No information found.

12. ECOLOGICAL INFORMATION

Environmental Fate:

Mobility:

The product is miscible with water. Zinc, copper and manganese are in a non-water soluble form.

Persistence and degradability:

Zinc, copper and manganese are fundamental inorganic nutrients and are persistent in the environment.

Ecotoxicity:

Not known. However, care should be taken not to contaminate water courses or sewage systems, as this product may be harmful to aquatic organisms.

13. DISPOSAL CONSIDERATIONS

Contaminated absorbents, surplus product (in diluted form), etc., should be buried in approved landfill. Comply with any local legislation applying to waste disposal. Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to an approved waste facility. Processing, use or contamination of this product may change the waste management options. Surfactants can cause foaming problems in biological wastewater treatment plants and other high shear operations. Dispose of container and unused contents in accordance with local requirements.

14. TRANSPORT INFORMATION

Non – Hazardous

15. REGULATORY INFORMATION

EC Classification: None
Risk – Phrase: R22 – Harmful if swallowed.
R36/37/38 – Irritating to the eyes, respiratory system and skin.
Safety -Phrase: S1/2 – Keep locked up and out of the reach of children.
S7/9 – Keep container tightly closed and in a well-ventilated place.
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S20/21 – When using, do not eat, drink or smoke.
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