MARINE 3 TECHNOLOGIES (Pty) Ltd

We make water work better

www.marine3technologies.com

## TECHNOLOGY

Marine 3 Technologies (M3T) offers a groundbreaking patented anionic surfactant that has been extensively researched and developed from sea water over a period of 11 years.

M3T is primarily used in the pre-treatment of water. The quality of water and its properties are manipulated in an entirely natural way.

## M3T AND FERTILIZER

Applications are based on lowering the surface tension of water, resulting in the enhanced wetting ability of water and in the case of agglomerates, an enhanced increase in capillary potential.

It is further based on the reduction of interfacial tension provided by M3T 3005 between organic solvents, resulting in a stable state, where conductivity can be influenced positively.

## CONVENTIONAL REGIMES

Fertilizers are the natural or artificial substances containing chemical elements that improve growth and productiveness of plants. Fertilizers enhance the natural fertility of the soil or replace the chemical elements taken from the soil by previous crops.

Chemical fertilizers include one or more of the three macro elements that are most important in plant nutrition: nitrogen, phosphorus, and potassium. Of secondary importance are the micro elements sulphur, magnesium and calcium among others.

## CHALLENGES OF THE INDUSTRY

**Wetting:**

Some fertilizer particles cannot be wet with normal water making it unavailable for absorption by plants. To mix fertilizer into water, additives are required or aggressive agitation or milling must be performed to achieve suspension.

**Agglomeration:**

With conventional water applications fertilizers agglomerate to form bigger particles thus reducing absorption by plants.

## M3T 3005 SOLUTION

The wetting and de-agglomeration potential of M3T 3005 provides wetting for dispersion and prevents agglomeration of organic substances in water, thus achieving de-agglomeration during agitation for better absorption.

## HARNESSING NATURE AND SCIENCE TO INVIGORATE SOIL AND PLANTS

**M3T 3005 and all Fertilizers.**

- Dramatically reduces nitrogen fertilizer usage.
- Unlocks bound fertilizer, humus and nutrients.
- Stimulates soil bacteria and funguses vital for soil health.
- Increases plant health and palatability.

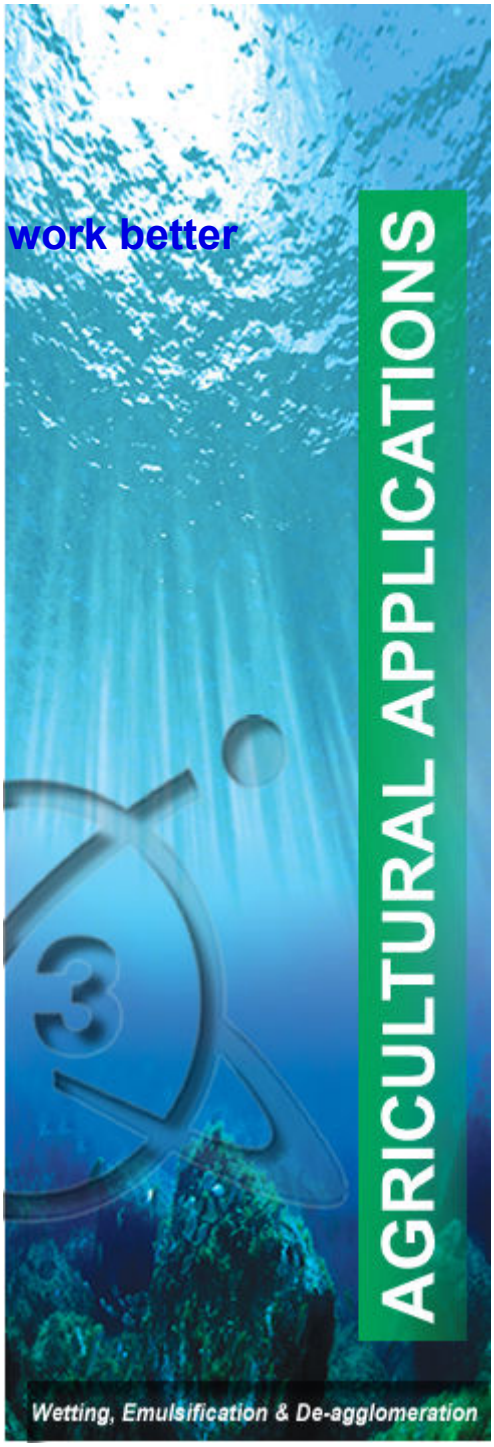



**Photo gallery — wetting**

Water

Urea

Sulphur

With M3T 3005

## Pasture case study

A cocktail was manufactured suited for foliar feeding of cattle pastures. The success was phenomenal. The growth of the Clover leaf was enhanced, virtually doubling in size. This resulted in a larger milk production. Due to this success the following trial was conducted:

Water was pre treated with M3T 3005 with a dosage range of 0.01% to 0.05 % per volume of water.

Resulting from the trial on a commercial farm, the following approximate cost comparisons were noted:

**Conventional urea application:**

Urea (N) costs R 3 200/Ton or R 3.20/Kg (prices at time of trial)

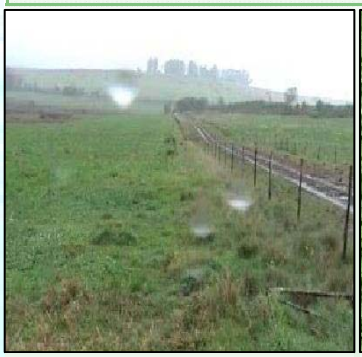
**M3T + humic acid program @ 200L water / ha**

| Product | Cost | Application rate | Cost/ha |
|---|---|---|---|
| M3T 3005 | R65/ℓ | 0.01%/ℓ water | R1.30 |
| Humic Acid | R22/ℓ | 2kg/ha | R44.00 |
| Urea * | R3.20/kg | 20kg/ha | R64.00 |
| **TOTAL COST** | | | **R109/ha** |

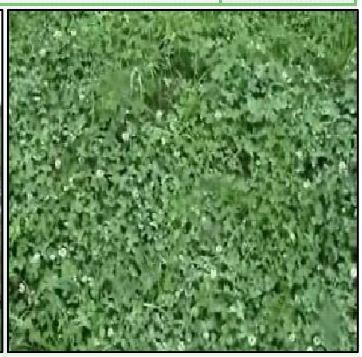
* for current costs use latest prices

**Long term direct comparisons**

| System | Ha | Cost | Annual applications | Cost/ annum |
|---|---|---|---|---|
| Urea only (100kg/ha) * | 200 | R320 | 6 | R384 000 |
| M3T 3005 + humic | 200 | R109 | 6 | R130 800 |
| **ANNUAL SAVING** | | | | **R253 200** |



Humic Acid Enhancement



Pastures

## Case study on sugar cane

**Farm:** Eston, Kwa Zulu Natal, April 07

**Cane N31** 3rd Rotoon (third regrowth)

A cocktail was manufactured using Marine 3005 as a base to create "Marine Grow". A cane field with a N31 variety sugar cane was sprayed with Marine Grow at a growth of 350mm and again at 850mm . The mixing ratio was as follows.

5 Litres Marine Grow
600 Litres Water
50 kg Urea Fertilizer

At a ratio of 200 litres per hectare this mixture was sprayed onto the sugar cane as a foliar. The following results were achieved:

- After 6 months the difference could clearly be seen between the treated cane and the control under a CMS fertilizing regime.
- At 12 months the difference in growth was approximately 500mm.
- At 17 months the difference was approximately 750mm

One month prior to harvesting 4 sticks of the Marine Grow treated sugar cane and 4 sticks of the normal CMS treated cane was supplied to the Sugar Laboratories in Pinetown for testing. The test results are reflected in the Results Table on the right.

**RESULTS TABLE**

| | MARINE GROW | CMS GROW |
|---|---|---|
| Identity | N31 | N31 |
| No of sticks | 4 | R130 8004 |
| Mass of sticks | 3.25 | 2.050 |
| Diameter of storks (mm) | 31.8 | 31.2 |
| FIB % of cane | 13.6 | 12.2 |
| Brix % of cane | 17.9 | 19 |
| Purity | 86 | 85.3 |
| Pol % of cane | 15.4 | 16.2 |
| URE % of cane | 13.5 | 14.1 |
| Cane Value | 812.5 | 512.5 |
| Sucrose g/stick | 125.1 | 83.0 |


## M3T ASSISTS IN:

- Stabilizing nitrogen and improves nitrogen efficiency.
- Facilitating the unbinding of locked up phosphate making it available for plant growth.
- Enhanced plant metabolism that leads to a better developed root system and enzyme formation, thus increasing vitamins, sugars, proteins, chlorophyll and resistance to stress.
- Increasing the permeability of the cells thus increasing nutrient uptake
- Increasing the water, oxygen and root movement within the soil.
- The pH buffering capacity assists in neutralizing the problems associated with pH extremes.
- Supplying carbon needed by microbes to digest nitrogen, which limits carbon stripping from soil.
- A fungi and micro-organism stimulant in soil.
- Substantially increasing the efficiency of nitrogen and potassium fertilizer's assimilation, due to an increase of membrane penetration.
- Applying fertilizer as a foliar feed, energy is not lost in conversion as the plant absorbs N directly as $NH_4$ rather than having to convert $NH_2$ from the soil into $NH_4$ as a nitrate protein for assimilation.
- The fertilizer **not** being leached out by rain and irrigation water as it is absorbed directly into the plant.
- The fertilizer being fully utilized for plant growth and is not locked up for crop residue break down.

CSIR our future through science

MSDS Available on request

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