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# SOIL TRIAL SUMMARY & PRODUCT GUIDE





# WELCOME TO NUTRIFERT AUSTRALIA

Nutrifert Australia provides quality soil amendment products to meet the needs of Australian farmers across a range of crops.

Our flagship products are **Ozcal** granular lime, **Ozgyg** granular gypsum, **Ozcalmag** granular dolomite & **OzgygZinc** granular gypsum & zinc compound, these products can be applied as a straight or blended with fertiliser.

We are an Australian owned company. We have a streamlined, local team that is empowered to help customers by responding quickly to customer needs.

**Ozcal**



### Ultra-fine Granular Lime

Ultra-fine particle size results in high reactivity of the pure calcium carbonate. Therefore, greatly reduced rates are applied compared to Aglime.

<b>Appearance</b>	White Round Granule
<b>Neutralising Value</b>	99%
<b>Calcium Content</b>	39.2%
<b>Particle Size</b>	95% less 45 micron (average 20)
<b>Granulation Sizing</b>	3-5 mm
<b>Common rates of Application:</b>	10-20% of Aglime
<b>Broadcast</b>	- 200-500kg/ha
<b>Banded</b>	- 50-200kg/ha

**OzcalMag**



### Ultra-fine Granular Dolomite

Ultra-fine particle size results in high reactivity of the pure calcium and magnesium carbonate. Therefore, greatly reduced rates are applied compared to Dolomite.

<b>Appearance</b>	Off-White Round Granule
<b>Neutralising Value</b>	99%
<b>Calcium Content</b>	20%
<b>Magnesium Content</b>	11%
<b>Particle Size</b>	95% less 45 micron (average 20)
<b>Granulation Sizing</b>	3-5 mm
<b>Common rates of Application:</b>	10-20% of Dolomite
<b>Broadcast</b>	- 200-500kg/ha
<b>Banded</b>	- 50-200kg/ha

**OzgygZinc**



### Ultra-fine Granular Gypsum & Zinc Compound

Ultra-fine particle size results in high reactivity of the pure gypsum + zinc. Therefore, greatly reduced rates are applied compared to standard agricultural gypsum with the added benefits of Zinc.

<b>Appearance</b>	Off-White/Grey Round Granule
<b>Purity</b>	98%
<b>Calcium Content</b>	22.4%
<b>Sulphur Content</b>	17.9%
<b>Zinc Content</b>	0.34%
<b>Particle Size</b>	95% less 45 micron (average 20)
<b>Granulation Sizing</b>	3-5mm
<b>Common rates of Application:</b>	10-20% of Gypsum
<b>Broadcast</b>	- 200-500kg/ha
<b>Banded</b>	- 50-200kg/ha

**Ozgyg**



### Ultra-fine Granular Gypsum

Ultra-fine particle size results in high reactivity of the pure gypsum. Therefore, greatly reduced rates are applied compared to standard agricultural Gypsum.

<b>Appearance</b>	White Round Granule
<b>Purity</b>	98%
<b>Calcium Content</b>	22.4%
<b>Sulphur Content</b>	17.9%
<b>Particle Size</b>	95% less 45 micron (average 20)
<b>Granulation Sizing</b>	3-5 mm
<b>Common rates of Application:</b>	10-20% of Gypsum
<b>Broadcast</b>	- 200-500kg/ha
<b>Banded</b>	- 50-200kg/ha

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# OZCAL INCREASES FERTILISER EFFICIENCY

It is a scientific fact that soil pH has a major impact on mineral availability, and therefore the efficiency of soil applied fertilizer. Recent trial results from the Mackay region proves that you can improve fertilizer efficiency by blending it with Ozcal and applying onto an acidic soil.

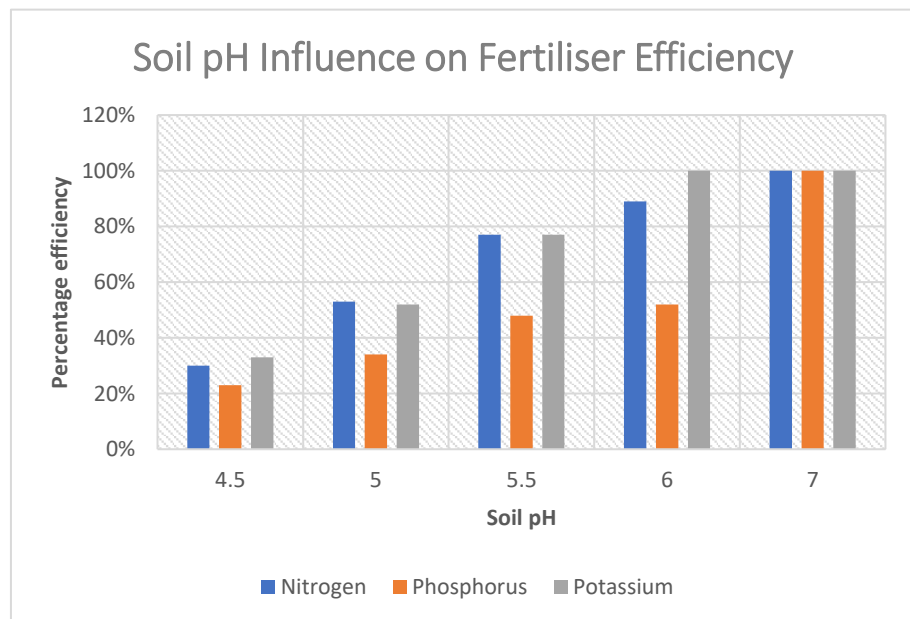
## Mackay Region Fallow Ground Trial

A soil trial was conducted in the Mackay region from March to May 2018 to illustrate the benefits of blending Ozcal with Fertiliser.

Soils in the Mackay to Proserpine areas are typically acidic, with pH's ranging between 4.5 and 5.5. This pH range has a negative effect on mineral availability and plant root health. Soluble phosphorus availability is a major concern in acidic soils, especially those with a pH below 5.5. The majority of P can lock up with aluminium, iron and manganese sometimes within a matter of hours.

The ultrafine particles contained in Ozcal granulated lime offer precision placement targeting the root zone where fertilizer acidifies the soil. By including Ozcal with DAP in a blend we improved the efficiency of nutrient release and availability from DAP. The high reactivity and quick release of Ozcal lime changed the pH in and around the root zone inside two months.

The soil tests were taken prior and then 2 months after applying the Ozcal and DAP blend at various rates.



## KEY RESULTS:

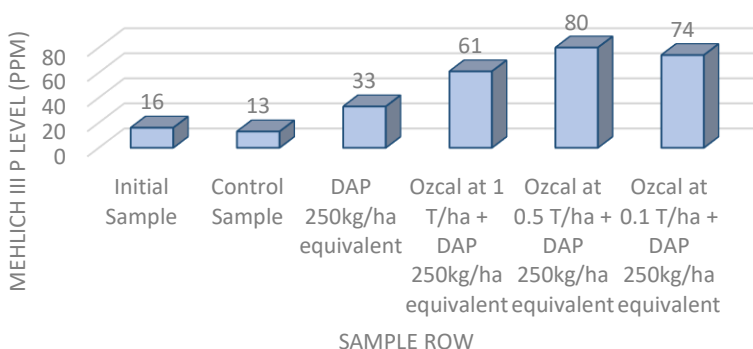
1. Ozcal successfully INCREASED THE AVAILABILITY of phosphorus when applied with DAP
2. Ozcal also successfully improved soil nitrogen levels, and calcium levels
3. Ozcal successfully increased pH



## Precision Application

The granular form of the lime in Ozcal allows direct placement in the fertilizer band where plant roots are active. Continuous nitrogen fertilizer use will acidify the root zone over time, therefore it is important to focus on concentrating lime applications in this area. Being in granular form, Ozcal can be applied as a straight or in a blend with fertilizer for a **one pass application** (broadcast or banded). The research has shown that Ozcal enhances the power of fertilizer when blended together.

Soil phosphorus levels 2 months after various Ozcal and DAP applications

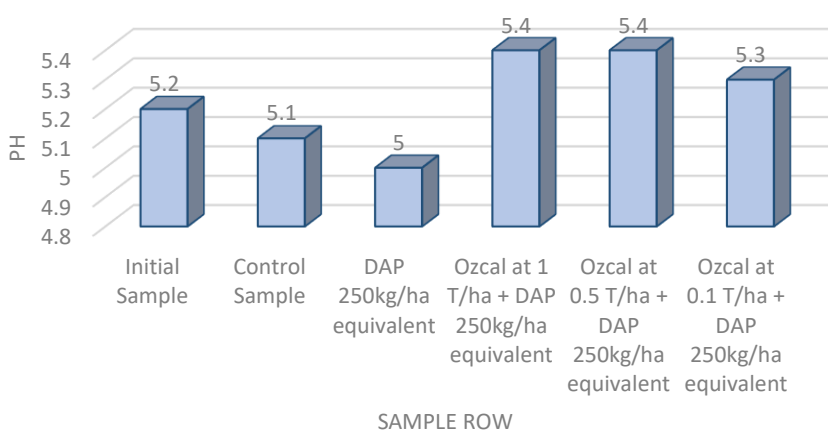


## Ozcal Granular Lime

The ultra-fine particles contained in every granule of Ozcal lime (95% under 45 micron) deliver superior soil pH adjustment and calcium release in the soil. The smaller the lime particle size, the greater the exposed surface area for reaction with acidic soil to neutralize pH and release calcium. Each Ozcal granule releases ultra-fine particles immediately upon contact with moisture, working deep into the soil to amend not just the top few centimetres, but the entire root zone.

This means you achieve your desired pH faster using Ozcal compared to broadcasting bulk lime, while also supplying your crop with available calcium, a nutrient strongly linked to plant health. You will also achieve results at much lower rates to standard coarse bulk lime.

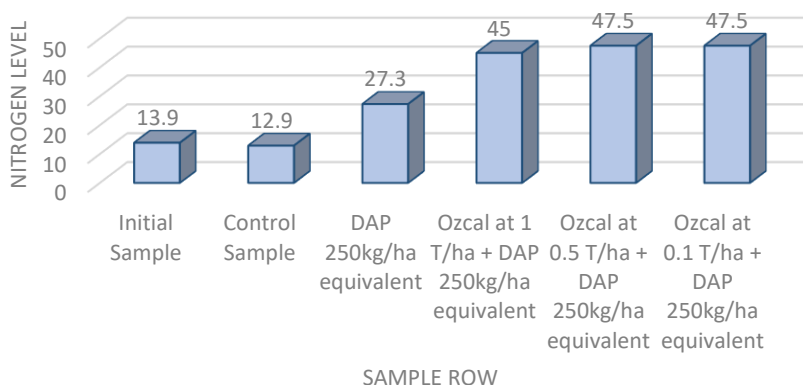
Soil pH levels 2 months after various Ozcal and DAP applications



## Application Rates

The superior release capabilities of Ozcal allow it to be applied right up until the day of row forming for planting crops. Rates will vary depending on the situation, things to consider are the type of crop, broadcast or in row application, row spacings and soil test results. We recommend yearly applications to maintain a steady pH throughout each season, and to boost beneficial soil microbes and maintain soil structure.

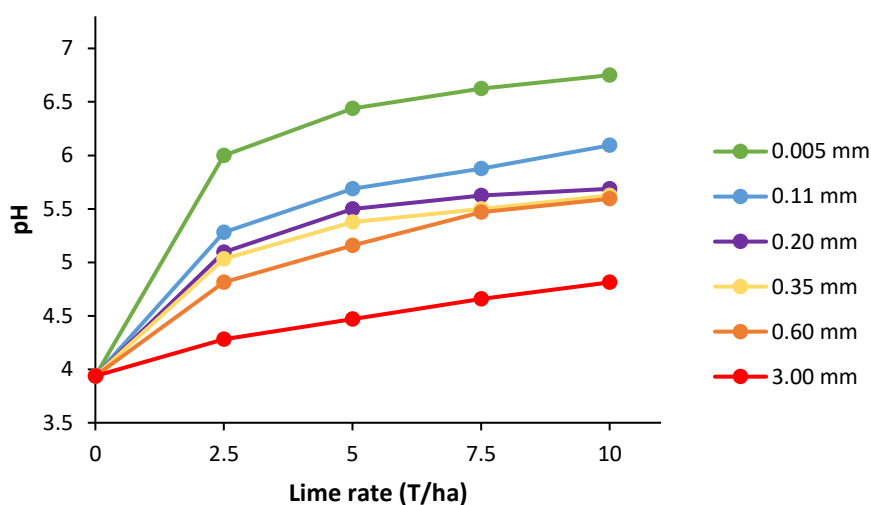
Soil Nitrogen levels 2 months after various Ozcal and DAP applications



## Effect of Particle Size on Lime Efficiency

A field experiment on wheat was conducted in Wagga Wagga by the Agricultural Research Institute over 4 years, to demonstrate the effect of particle size on acidic soil pH change.

It was found for all three application rates that the finer the particle size, the greater the increase in soil pH. This is due to the smaller particles having a greater combined surface area than the larger particles, resulting in more exposure to surrounding soil acids for significantly quicker pH changes. Ozcal has an average particle size of 0.02 mm whereas bulk lime particles can range from 0.075 to 5.0 mm.



Lime efficiency is the ability of a liming material to raise the soil pH, and so is of great importance to the grower when it comes to determining value for money. While higher lime application rates result in an increase in effect, **the lower average particle sizes were shown in this study to have the greatest influence on soil pH change. This demonstrates that particle size is the key consideration for determining value for money to the grower.** Bulk lime is comprised of fine to coarse particles size ranges, and those with more coarse particles will be less efficient. Therefore, as Ozcal contains lime particles averaging 20 micron, higher rates of more coarse grade lime are required to achieve similar effects. Essentially it is the fine particles that increase pH, and by increasing application rates of coarse material you are simply increasing the amount of fine lime particles in the soil. It is important that growers consider lime particle sizes when it comes to determining value for money, as the price per T is clearly misleading.

Application rate (tonnes/ha)	Particle size (mm)					
	3.00	0.60	0.35	0.20	0.11	0.005
2.5	9%	34%	47%	52%	58%	100%
5	13%	41%	53%	61%	64%	100%
10	29%	53%	55%	61%	73%	100%

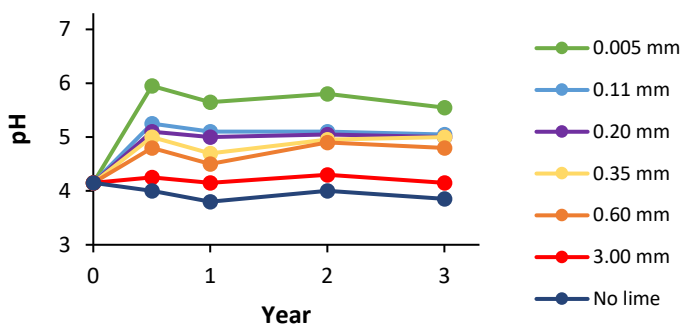
Percentage of lime that was efficient in changing soil pH



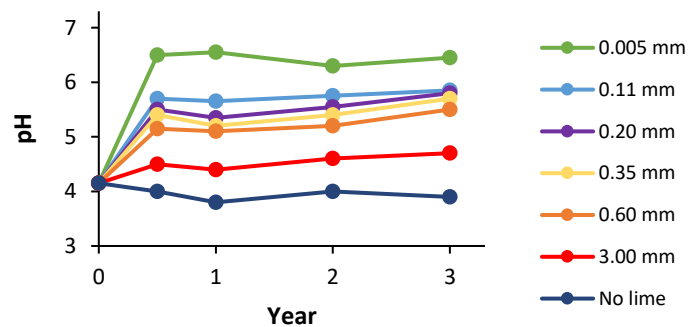


Over time it was shown that there was a small decline in soil pH for finer particle sizes and a slight increase with coarser particle sizes, however **the lime containing the coarser particles never achieved the same pH level even after 3 years. This more immediate rate of pH change makes it a lot easier for the grower and agronomist to predict within season results, and the results are even shown to outlast coarse.**

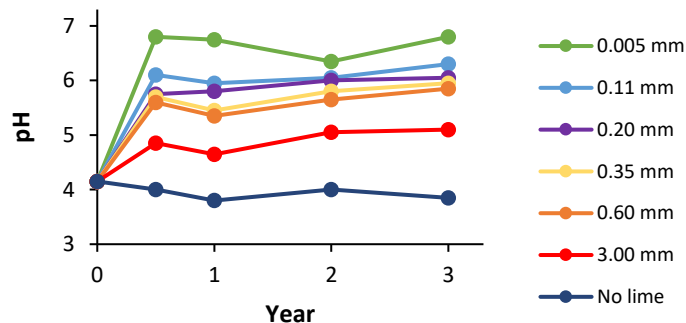
2.5 T/ha



5 T/ha



10 T/ha



The fine particle size required to achieve a rapid and required change in soil pH for optimal agricultural production is difficult to apply as it easily blows away and therefore, precision placement is not possible.

**Nutrifert has overcome this issue by combining ultrafine lime particles (0.02 mm or 20 microns) into a stable granule that can be applied where it is required with great precision and once it comes into contact with moisture it breaks down and reacts quickly to achieve rapid increases in soil pH.**

### Reference and Acknowledgement

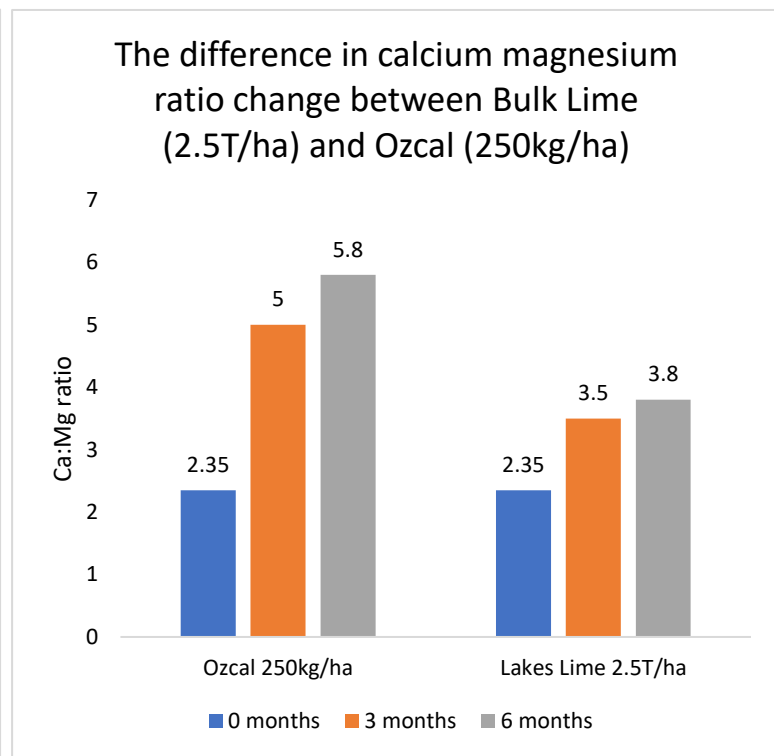
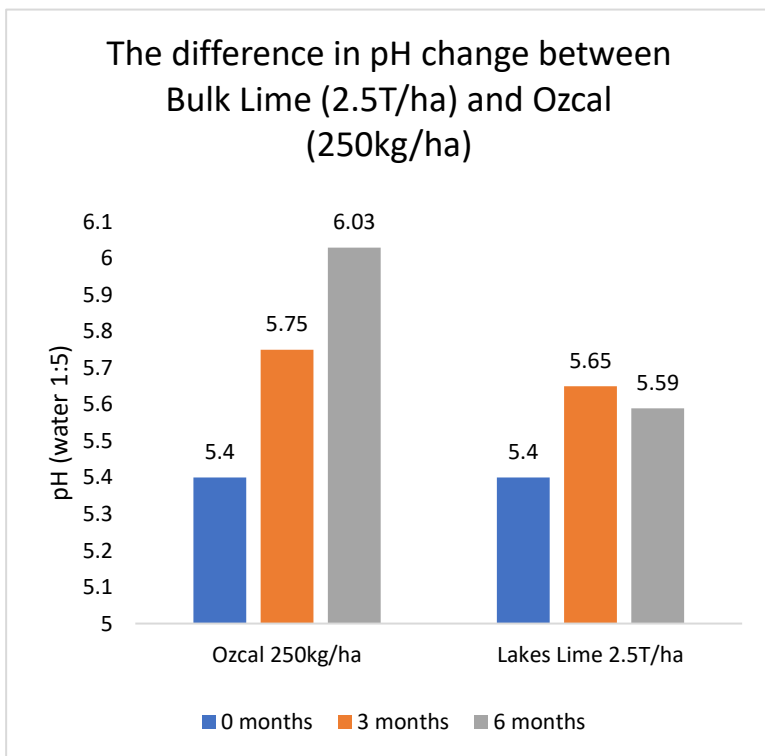
Scott B, Conyers K, Fisher R and Lill W (1992) Particle size determines the efficiency of calcitic limestone in amending acidic soil, 'Aust. J. Agric. Res.', 43, 1175-85, NSW Agriculture, Agricultural Research Institute, Wagga Wagga.



Trial results show

## OZCAL ACHIEVES BETTER RESULTS THAN BULK LIME AT A 10% APPLICATION RATE

An independent field trial conducted in the Bairnsdale region found that applying Ozcal at 250kg /Ha outperformed bulk lime applied at 2.5T/Ha. Ozcal also continued to improve the pH over time in the trial, whereas the bulk lime did not.



This clearly demonstrates:

- 1) Ozcal can alter pH levels and improve the calcium magnesium ratio at low application rates due to **unique fineness** (below 20 microns) and high **neutralising value** (99%+).
- 2) Ozcal changed pH rapidly and continued to do so over time whereas the bulk lime did not in the field trial.
- 3) The smaller the lime particle is in size, the greater the number of particles that will come in contact with soil. Which means a greater exposed surface area of particles to react with acidic soil to neutralize pH and release calcium and magnesium.

**Particle size** and **Neutralising Value** are critical for even and effective soil pH management, plant root health, and soil microbe performance.



# Ozcal and OzcalMag Delivers Excellent Results in Pastures



*“I applied OzcalMag at the rate you (250 kg/ha) suggested in June & was amazed at the spring pasture growth compared to last year when I first purchased this property. Many people commented on the colour of the pasture which also thickened up. There was very little clover present last year. This spring they were white with clover flower, 300mm+ high.” – John Ogilvy, Pasture Farmer in Coffs Harbour*

## Ozcal increased pH to the same level as bulk lime in an independent pasture trial

An independent field trial conducted in the Hume Region found that drilling **Ozcal** at 100kg/ha with pasture seed changed soil pH significantly across the entire row (an average increase of 0.2, replicated over 3 rows).



- 1) Lillydale lime, with a Neutralising value of 95% was applied at **2.5 T/ha** and achieved a pH **increase of 0.2 over a period of 2 years 5 months**, compared to the control sample.
- 2) Ozcal applied at **100 kg/ha** achieved an average pH increase of **0.2 within 5 months** in the field trial.

This demonstrates:

- 1) Ozcal can alter pH levels at low application rates due to unique fineness (below 20 microns) and high neutralising value (99%+).
- 2) Ozcal lime particles are small enough to move through the soil profile and amend pH of a larger soil volume, compared to bulk lime.

Even when coarse lime is incorporated, it has difficulty in moving across the soil profile as this picture above demonstrates. The dark colour indicates an area of high pH where the lime was placed, while the lighter colours are where the soil is still acidic because the lime could not reach it.

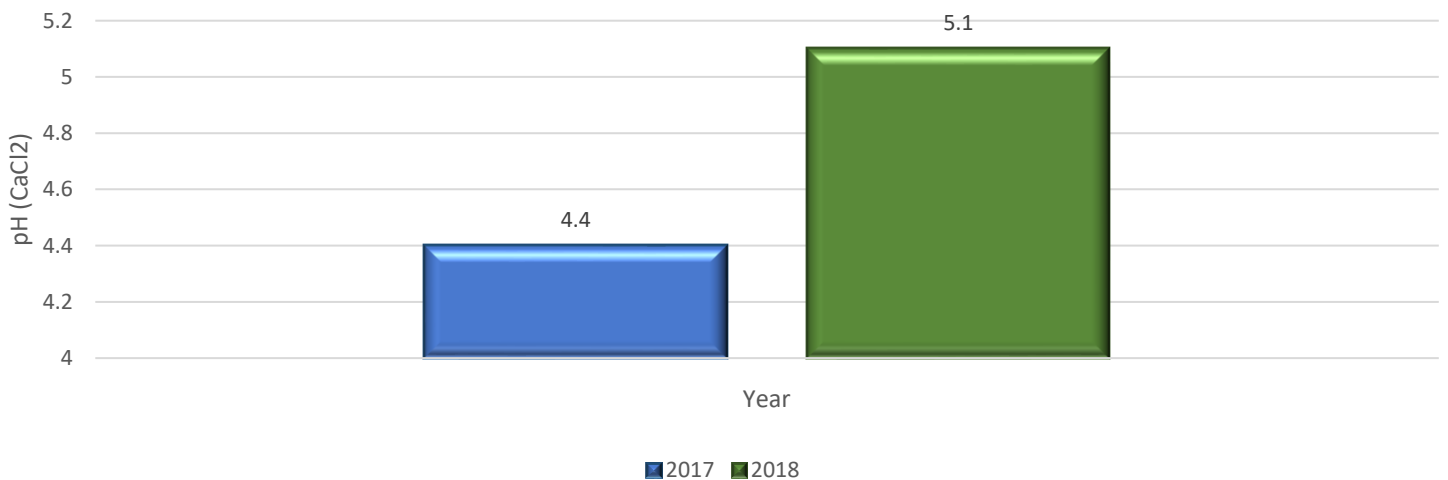
# OzcalMag Achieves Significant pH Change and Boosts Soil Nutrients

Granulated ultra-fine **OzcalMag** is the superior choice when it comes to dolomite. Recent trial results have shown significant positive benefits of **OzcalMag** on pH and nutrition.

## ***Bundaberg Region Soil Trial***

**OzcalMag** was applied at 500 kg/ha on a previously harvested sugar cane soil near Bundaberg. No crop was planted during the season, and a follow up soil test was taken 1 year after application to see if any changes had occurred. The soil was very light with deficient calcium and magnesium levels. It was also acidic, with a pH of 4.4.

pH change 1 year after applying OzcalMag at 500 kg/ha



**This dispels the myth that changes as a result of ultra-fine amendments do not last in the soil.**

### **Key Outcomes:**

1. pH increased by 0.7 (CaCl<sub>2</sub>), from 4.4 to 5.1

2. Magnesium levels increased from 24 ppm to 55 ppm

3. Calcium levels increased from 140 ppm to 300 ppm



## OzcalMag Granular Dolomite

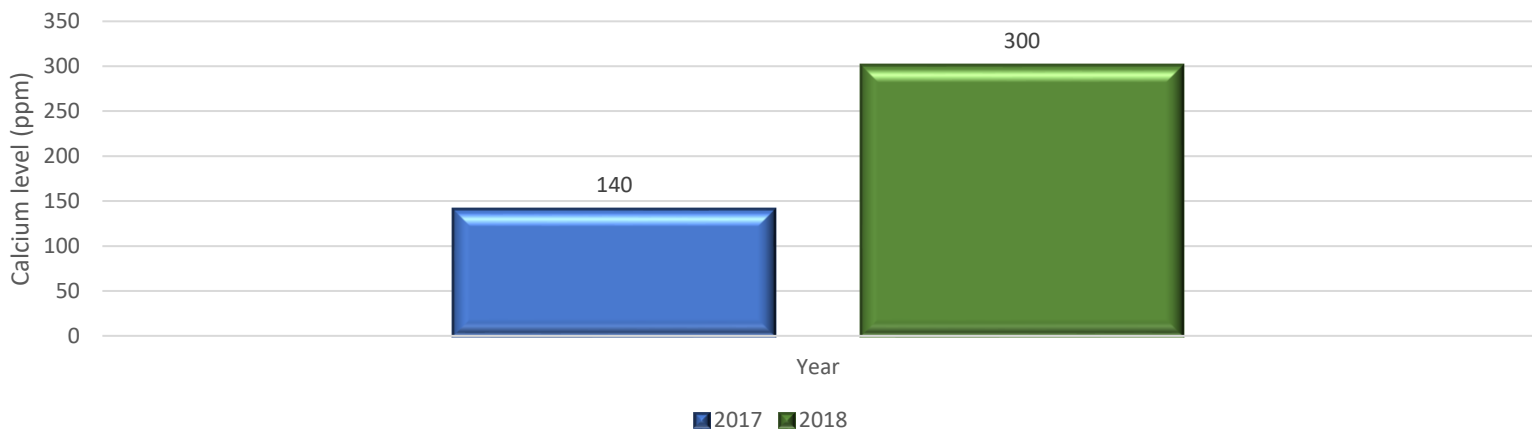
The ultra-fine particles contained in every granule of OzcalMag (dolomite) (95% under 45 micron) deliver superior soil pH adjustment, plus quick calcium and magnesium release into the soil.

The smaller the dolomite particle is in size, the greater the number that will come in contact with soil particles. Which means a greater exposed surface area of particles to react with acidic soil to neutralize pH and release calcium and magnesium.

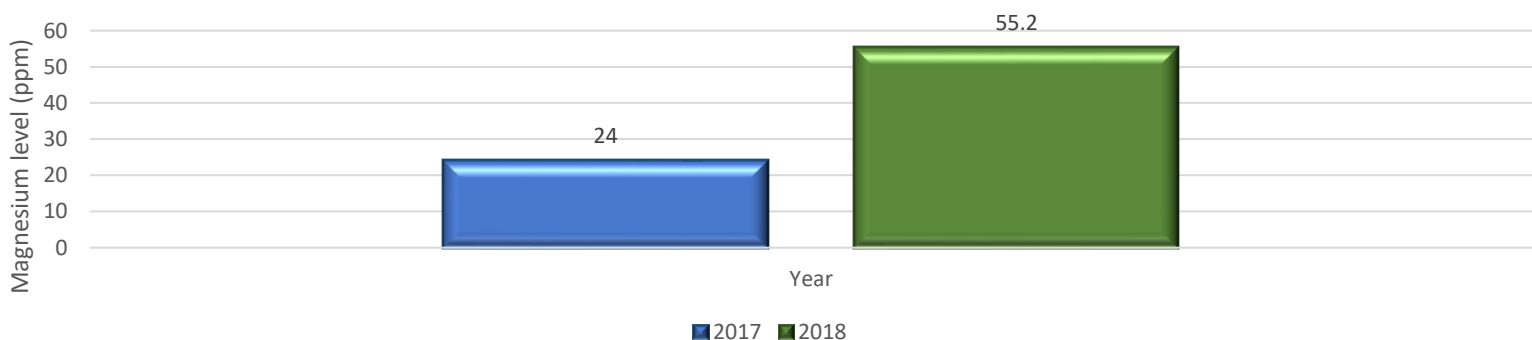
Each OzcalMag granule releases ultra-fine particles immediately upon contact with moisture, working deep into the soil to amend not just the top few centimetres, but the entire root zone. This means you achieve your desired pH faster using OzcalMag compared to broadcasting bulk dolomite lime, while also supplying your crop with available calcium and magnesium.

This makes it a great option not just for pH adjustment, but for supplying nutrition in acidic soils as well. You can clearly see here the results will last too.

### Soil Calcium levels 1 year after applying OzcalMag at 500 kg/ha



### Soil Magnesium levels 1 year after applying OzcalMag at 500 kg/ha



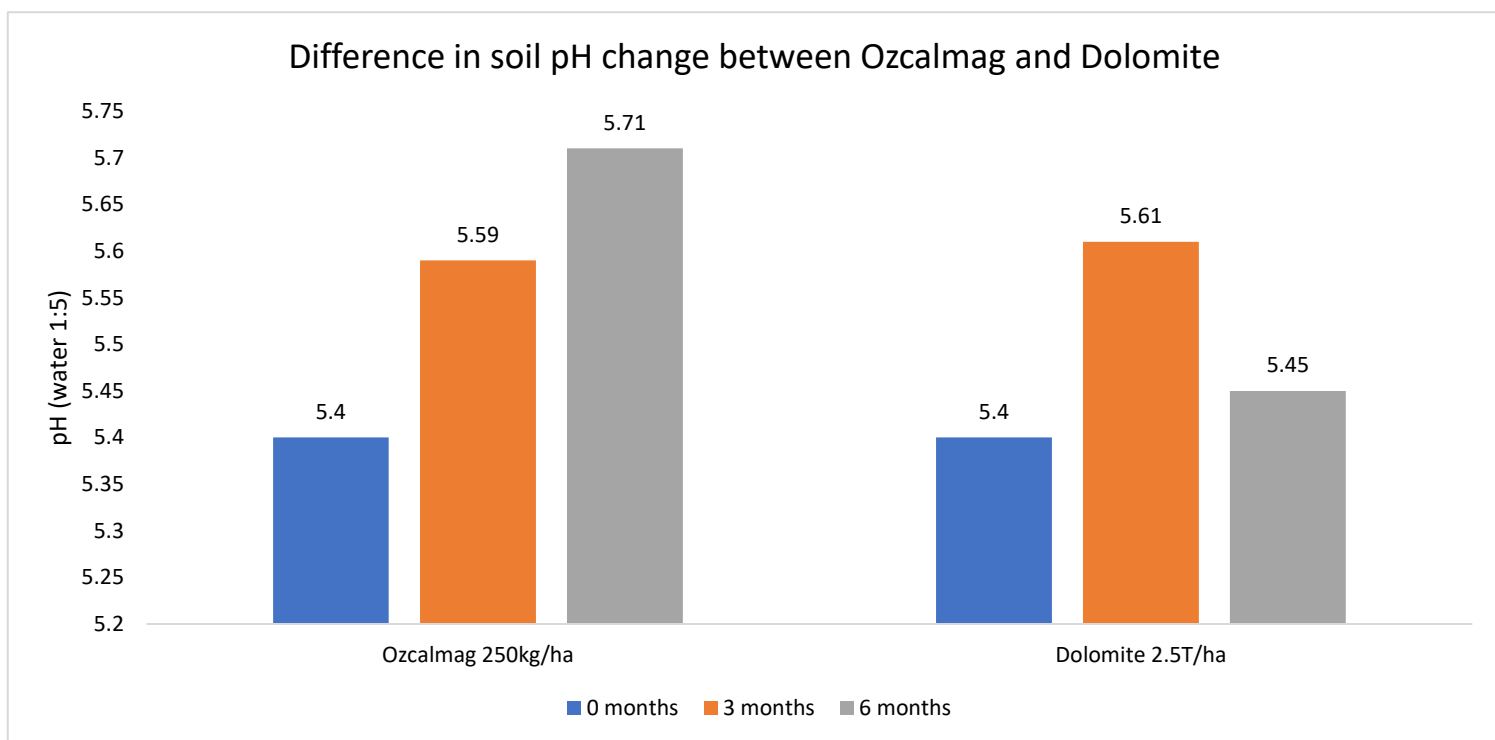




Trial results show

## OZCALMAG ACHIEVES BETTER RESULTS THAN BULK DOLOMITE AT A 10% APPLICATION RATE

An independent field trial conducted in the Bairnsdale region found that applying OzcalMag at 250kg/ha continued to increase soil pH over time, whereas Bulk Lime applied at 2.5T/ha did not.



This clearly demonstrates:

1. Ozcalmag can alter pH levels at low application rates due to **unique fineness** (below 20 microns) and high **neutralising value** (99%+).
2. Ozcalmag changed pH rapidly and continued to do so over time whereas the bulk dolomite did not in the field trial.
3. The smaller the dolomite particle is in size, the greater the amount that will come in contact with soil particles. Which means a greater exposed surface area of particles to react with acidic soil to neutralize pH and release calcium and magnesium.

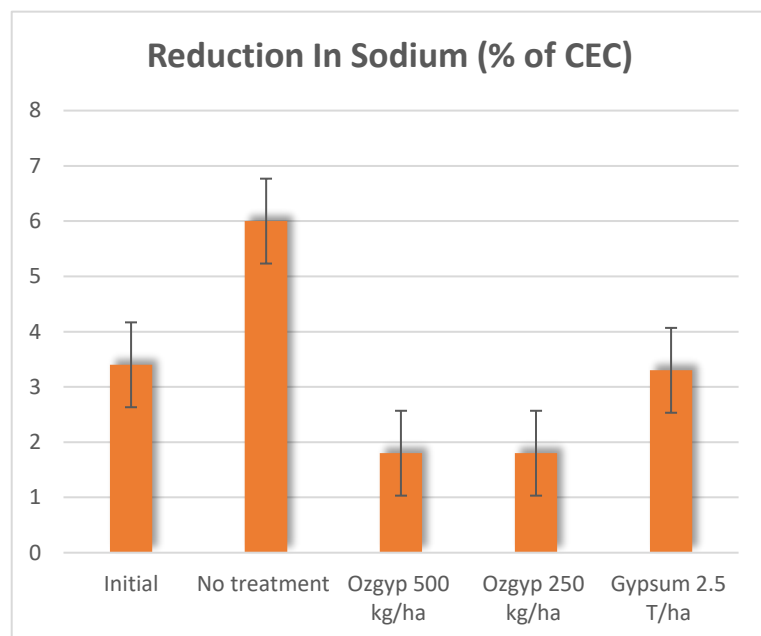
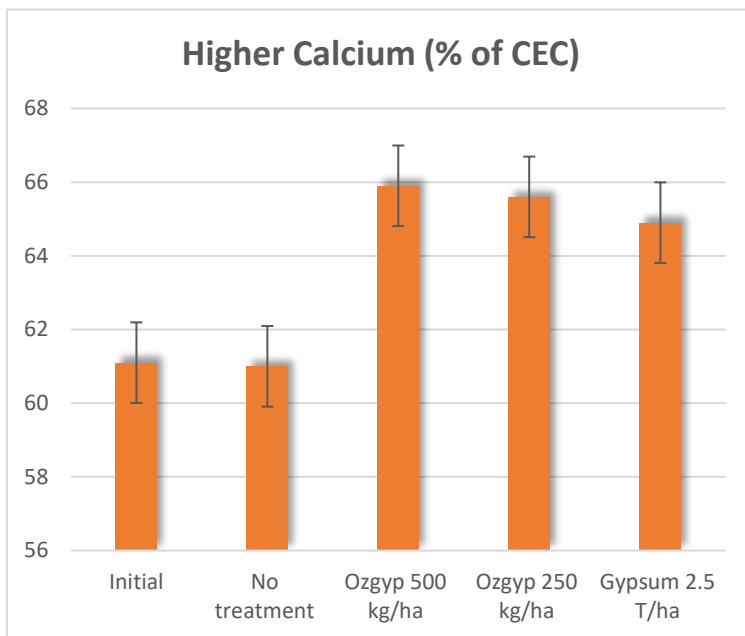
**Particle size** and **Neutralising Value** are critical for even and effective soil pH management, plant root health, and soil microbe performance.



Trial results show

## OZGYP PERFORMS BETTER THAN BULK GYPSUM AT A 10% APPLICATION RATE

A trial conducted in the Burdekin region found that Ozgyp successfully improved the soil mineral balance by increasing calcium percentage and reducing sodium.



### This clearly demonstrates:

1. Ozgyp has a unique ability to improve the soil mineral balance and reduce sodium levels at low application rates due to unique fineness (below 20 microns) and high purity levels (98% plus).
2. Higher application rates of bulk gypsum products were inefficient compared to Ozgyp.

The small particle size of Ozgyp ensures quick solubility in water compared to standard gypsum, and therefore quick action in problematic soils with high sodium and low calcium. The high purity also delivers better value for money compared to lower grade sources of gypsum.

High sodium levels degrade soil quality by weakening the bond between soil particles. This leads to tight closed soils with poor water infiltration and plant root health. Applications of Ozgyp replace the sodium ions with calcium, which provides a more stable soil with superior fertility.

# OzgypZinc®

OzgypZinc is a compound product with  
1% Zinc Sulphate in **EVERY GRANULE**

<b>APPEARANCE</b>	Off white/grey round granule
<b>CALCIUM CONTENT</b>	22.4%
<b>SULPHUR CONTENT</b>	17.9%
<b>ZINC CONTENT</b>	0.34%
<b>PARTICLE SIZE</b>	95% less 45 micron (average 20)
<b>GRANULATION SIZE</b>	3-5mm
<b>COMMON RATES OF APPLICATION</b>	200-500kg/hectare
<b>PACK SIZE</b>	1 tonne

Even in its pure form, Gypsum & Zinc have a very low solubility. The finer the Gypsum & Zinc particle the quicker the Calcium, Sulphur & Zinc is released.

OzgypZinc's high purity and ultra fine particles make it highly reactive compared to agricultural Gypsum, with the added benefit of Zinc.



# GENERAL INFORMATION

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