

BioGusino

Typical Analysis	
% w/v	
Calcium (as Phosphate)	22.0%
Phosphorus	9.95%
Citrate Soluble	7.43%
Water Soluble	1.04%
Citrate Insoluble	1.48%
Total Organic Carbon	2.13%
Magnesium	1.80%
Potassium	0.67%
Sulphur	0.22%
Sodium	0.19%
Nitrogen (Organic)	0.03%

Trace Minerals

indee minerals	
ppm w/v	
Silicon	5559
Iron	1333
Manganese	459
Zinc	112
Boron	13.2
Copper	2.84
Cobalt	0.61
Molybdenum	0.21
Conductivity (µs/cm)	7,600
Specific Gravity	1.43
рН	7.4



Typical Analysis % w/v Calcium (as Phosphate) 21.3% Phosphorus Citrate Soluble 7.72% Water Soluble 0.99% Citrate Insoluble 1.15% Total Organic Carbon 1.76% Magnesium 1.94% Potassium 2.52% Sulphur (as Sulphate) 1.58% Sodium 0.27%

Nitrogen (Organic) 0.03%

Trace Minerals

ppm w/v	
Silicon	3480
Iron	2380
Manganese	457
Zinc	88
Boron	19.8
Copper	3.13
Cobalt	0.66
Molybdenum	0.29
Conductivity (µs/cm)	43.367
7	,,
Specific Gravity	1.50
рН	7.1

Typical Analysis % w/w Calcium (as Phosphate)...... 30.3%

Bio Gusino

Phosphorus	15.7%
Citrate Soluble	6.18%
Water Soluble	0.71%
Citrate Insoluble	8.88%
Total Organic Carbon	1.34%
Magnesium	2.34%
Potassium	0.19%
Sulphur	0.39%
Sodium	0.26%
Nitrogen (Organic)	0.04%

Trace Minerals

ppm w/w	
Silicon (available)	155
Iron	1787
Manganese	404
Zinc	117
Boron	15
Copper	
Cobalt	1
Molybdenum	0.16

Particle Size (average)	5 µm
Bulk Density 700-750	kg/m³
рН	7.45

Bio Controis Re Mother Nature's Best Fertiliser















A Rich Source of Natural Phosphorus, Calcium, Silicon, Potassium, Organic **Carbon and Ocean Minerals**

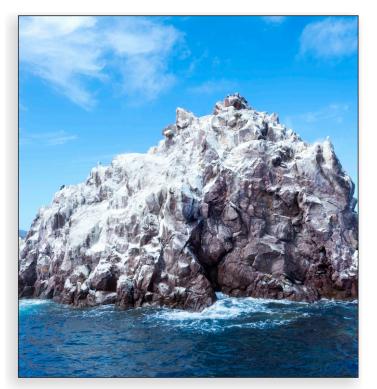
For Use with Nuts, Grains, Fruits, Flowers & Vegetables

BioGuano[™] and the future of phosphatic fertilisers:

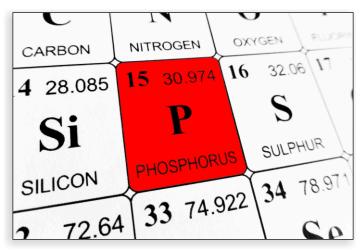
Phosphorus (P) is a non-renewable resource with peak Phosphorus (half-depletion of known global reserves) predicted to occur between 2040 and 2060. On the other hand, P levels in agricultural soils are rising because most of the P applied as synthetic fertiliser (80-90%) is sorbed by soil particles rendering it temporarily or permanently unavailable to most of our important crop species. The challenge ahead is to utilise and responsibly manage all P fertiliser resources, producing healthy crops and animals while meeting the needs of a growing population. BioGuano[™] represents a viable natural option to synthetic P fertilisers. The unique combination and forms of plant-available Phosphorus, Calcium and Silicon helps in several ways to protect and extend Phosphorus nutrition.

Naturally-sourced, minimal intervention, certified organic farm input:

Responsibly sourced seabird guano and state-of-the-art minimal processing in Australian-based facilities is the recipe for high quality BioGuano[™] fertilisers. Australian Certified Organic allowed input No. 13250. By switching to BioGuano[™] natural phosphate fertiliser, any grower whether organic, biological, biodynamic or conventional can extend and improve the Phosphorus nutrition and quality of their crops.



BioGuano is a rich, liquid source of organic Calcium and Phosphorus.



BioGuano[™] represents a viable, natural option to synthetic P.

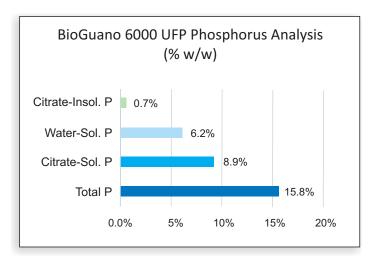


What is BioGuano[™]?

BioGuano[™] fertilisers are based on seabird guano, a complex, natural fusion and decomposition of bird droppings, coral, fish and seaweed that has consolidated over thousands of years. Seabird guano was the first concentrated phosphate fertiliser used in early America and Europe that demonstrated dramatic yield increases and led to the rapid expansion of agriculture in those countries. Responsibly sourced from a clean, ancient marine environment, BioGuano[™] fertilisers retain a wide analysis of plant-available minerals and the vitality associated with it's wild ocean origins. BioGuano[™] is a rich source of Calcium and Phosphorus that avoids incompatibility issues found in soluble formulations. BioGuano[™] products are quality phosphatic fertilisers and soil conditioners providing a natural blend of essential and beneficial plant nutrients, and co-factors for broad-spectrum plant nutrition and soil health. Available in various liquid or micronised powder formulations. BioGuano[™] fertilisers are convenient to use on any crop, at any time during the season, helping to increase yield, taste and quality while also naturally improving soil health.

Extended Phosphorus availability for high yield and quality crops:

As the crop grows through stages of germination, flowering, fruit set and maturity, it's requirement for available P increases. Because Phosphorus is central to energy capture and efficient photosynthesis, plants need P every day, not just during the establishment phase. There are inherent problems associated with synthetic phosphate fertilisers that are manufactured to be highly water-soluble and fast-acting. Crop uptake of Phosphorus from synthetic fertiliser represents a small fraction of what is applied (10-20% in the first year) due to soil reactions affecting availability. Soluble Phosphorus is immobilised rapidly in most soils by interactions with major soil cations (Aluminium, Iron, Manganese, Calcium and Magnesium).



Why crops need Phosphorus every day:

Phosphorus is an essential nutrient that performs and facilitates many critical life functions in the plant and helps produce biomass and a myriad of unique compounds that make plants so important to us. To optimise yield and quality, a crop nutrition program should include products and application strategies that maintain Phosphorus availability every day from the beginning of the growing season through to crop maturity and harvest. Much of the Phosphorus taken up by plants ends up in structures like the nucleotides that make up genetic material (DNA and RNA) and phospholipid cellular membranes that selectively partition what enters and exits from cells. Some of the P acquired by plants is cycled in high-energy phosphate bonds found in adenosine di-phosphate and tri-phosphate (ADP/ATP), NADPH and phosphate-rich enzymes associated with photosynthesis, the most important biochemical reaction for life on Earth.



Soluble Phosphorus is immobilised rapidly in most soil types.

Three forms of natural Phosphorus:

These "fixing" reactions with soil cations create insoluble phosphate complexes, shortly after application, limiting availability to young crops. Bioguano[™] fertilisers contain Phosphorus in three different forms that helps extend the availability of P through the crop growth cycle. The fast-acting, water-soluble fraction helps initiate early growth and establishment, while the citrate-soluble P is liberated by organic acids and phytases (enzymes) secreted by developing plant roots and microbes living in the rhizosphere. In this way, the citrate-soluble fraction provides P availability that responds closely to the plant's requirements mid-season to maturity. The remaining citrate-insoluble P boosts the non-labile soil Phosphorus reserves providing longer term availability across seasons.

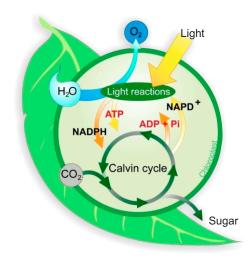


BioGuano[™] helps maintain Phosphorus availability every day from the beginning of the growing season through to crop maturity & harvest.

Phosphorus is crucial to efficient photosynthesis:

While minerals from soil and fertilisers are essential for plant growth and function, over 95% of the food biomass and nutrition that we create on farms is the result of photosynthesis. A farmer's income relies not only on the nutrition provided for crops, but how efficiently photosynthesis is managed on a daily basis. Photosynthesis is comprised of two distinct phases – the Light Reaction and the Dark Reaction or Calvin-Benson cycle. The light reaction is the initial stage of photosynthesis which traps sunlight energy during the day and uses inorganic Phosphorus to create high-energy bonds in ATP and NADPH, storing energy for a multitude of bio-chemical reactions within the plant. The light-independent dark reaction is the second step of photosynthesis which utilises atmospheric carbon dioxide and the energy stored in ATP and NADPH to produce sugar (glucose). Phosphate, when bonded to sugars, provides part of the energy to make different kinds of sugars, carbohydrates and starches, which are then ultimately transformed into all the organic compounds found in

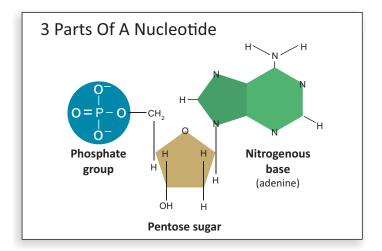
plants. Highly efficient photosynthesis also provides additional energy and carbohydrates to support strong immune function and build plant resilience – the capacity of crops to tolerate environmental and biotic stressors that place huge demands on our ability to produce nutritious food for population growth in a changing climate.





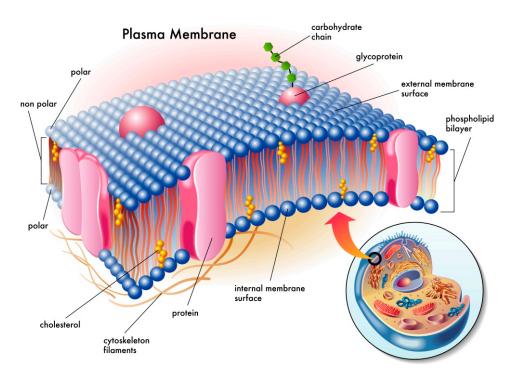
Phosphorus in plant genetic coding and cell replication:

Phosphorus is a vital component of amino acids, the building blocks of genes and chromosomes and is therefore an essential part of transferring the genetic code "blueprint" to the next generation. An adequate supply of Phosphorus is essential to the development of new cells and for all aspects of plant growth and development. Relatively large quantities of Phosphorus, as phytic acid, are stored in seeds and fruit. When seeds germinate, phytic acid breaks down to supply an early source of Phosphorus for rapid cell division and growth of the emerging root system.



Operation of phospholipid cellular membranes:

Plant cells can accumulate nutrients at much higher concentrations than are present in the soil solution. Roots have the ability to extract nutrients from the soil solution where they are present in very low concentrations and against an osmotic gradient. Plants use Phosphorus in the production of phospholipid bilayers, critical components of cell membranes. The lipid bilayer is embedded with channel proteins and acts as a selective barrier to the passage of molecules and ions into and out of the cell. Movement of nutrients within the plant depends largely upon the initial transport through the phospholipid cell membranes and channel proteins. This requires energy to oppose the forces of osmosis. ATP and other high energy P compounds provide the needed energy to oppose the forces of osmosis and drive this process.



How plants acquire Phosphorus:

A process of interception and diffusion is required for a plant to acquire adequate and sustained amounts of soil P. Plants increase their access to P by increasing the size of their root systems and the amount of surface area in close contact with soil. Plants, with limited access to P, will increase their root to shoot ratio by diverting growth energy into making more root structures and promoting mycorrhizal colonisation. Roots, root hairs or mycorrhizal hyphae must be close to where P is absorbed onto the surface of soil particles. The root system depletes soluble P from the soil solution causing desorption of P from soil particles and the newly soluble P can then diffuse to the roots. Enzymes secreted by roots and microbes in the rhizosphere also play a role in P acquisition from reserves in parent material, organic matter and phosphate/cation complexes. Increasing the production of fine root hairs can dramatically increase the amount of root surface area in contact with soil and is less energy expensive than growing new roots. While diverting photosynthate into promotion of mycorrhizal colonisation is even more efficient at accessing soil P than growing root hairs.



Abundant, bio-available Phosphorus encourages early root growth.

Phosphorus acquisition and soil Phosphorus pools:

Soil Phosphorus is present in three "pools" of varying accessibility to plants – solution P, active P (labile) and the fixed P pool (non-labile). The bulk of soil P is virtually inaccessible being present as insoluble and fixed P forms. The active P pool is in rapid equilibrium with soil solution P. Root uptake of solution P leads to a release of P from the active pool into the soil solution. Phosphorus in the soil solution is highly accessible but represents less than 10% of the soil P reserves and is vulnerable to fixation and return to the less available forms. To overcome shortages in the solution P pool, fertilisers containing large amounts of water-soluble P are usually applied before or at planting. Crop uptake of Phosphorus from synthetic fertiliser represents a small fraction of what is applied (10-20% in the first year) due to soil reactions affecting availability.

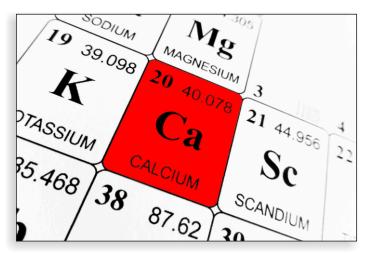


Phosphorus fertilisers and beneficial biology:

The main route for Phosphorus uptake is interception of adsorbed P and subsequent diffusion into the soil solution, therefore most Phosphorus fertilisers are placed as close as possible to where the roots are located or will be located. Concentrating P fertilisers near root systems improves P uptake and lowers the risk of rapid P fixation. The rhizosphere, specifically the aerobic soil layer where root systems acquire most of their soil-borne nutrients, is home to about 80% of the beneficial micro-organisms that feed, regulate and protect our crops. Beneficial biology plays an important role in Phosphorus uptake by producing phosphatases and organic acids to liberate Phosphorus from inorganic and organic pools. Organic matter represents between 20-80% of the total P reserves in mineral soils but this source needs to be mineralised before acquisition by plants. BioGuano[™] fertilisers are "microbe-friendly" with a very low salt-index and neutral pH and are safe to soil biology even when applied directly to the root zone. Plants adapt to low P availability by increasing the surface area of the root system with extra branching and root hairs, producing P-mobilising exudates and forming mycorrhizal associations. Mycorrhizal fungi significantly improve plant nutrition by allowing access to P from a larger volume of soil than is possible for the root system alone. Mycorrhizal fungi can also mineralise organic P. However, the formation of mycorrhizal associations with plants is susceptible to limits based upon phosphate availability. Mycorrhizal access to root colonisation is limited by plants when soluble phosphates are readily accessible. BioGuano[™] fertilisers contain mainly citrate soluble and citrate insoluble phosphates that do not limit mycorrhizal colonisation and in fact increase overall P nutrition of plants when mycorrhizae start "harvesting P" from these Phosphorus pools.

BioGuano[™] contains plant-available Calcium for healthy soils and crops:

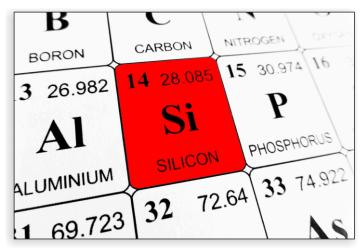
Calcium is an essential nutrient at the heart of healthy soils and crops. As the dominant soil cation, Calcium strongly influences soil pH, aggregate structure, soil aeration and drainage, microbial activity and humus formation. Plants also require Calcium for localised control of cell division at the growing tips of roots and shoots, in pollen tube elongation, structural stability in cell walls and cell membrane integrity. Root hairs, produced near the growing point of young roots, must be continuously replaced so plants can continue to access water and nutrients. Calcium regulates cell division required to produce new root tips and has a role in determining the direction of growth of the expanding root system. Young roots also produce important plant growth hormones that regulate the vegetative and reproductive growth processes. Nitrogen, found in ammonium phosphate fertilisers, can reduce soil Calcium levels through leaching and general soil acidification. BioGuano[™] fertilisers supply plant-available Calcium without the risk of Calcium losses associated with high analysis synthetic fertilisers.



Calcium is an essential nutrient at the heart of healthy soils and crops.

Natural source of beneficial plant nutrients and co-factors:

Silicon is currently defined as a "beneficial" plant nutrient although there is mounting evidence that this background element should be considered essential to plant growth. Despite Silicon being a common element in the Earth's crust it is only useful to plants when converted to mono-silicic acid. Plant-available Silicon in farm soils (especially under intensive cropping) is widely on the decline due to the effects of ecosystem management and the yearly withdrawal by crop harvest (given that many important food crops are Si accumulators). BioGuano[™] supplies plant available Silicon that serves numerous purposes inside and outside the plant. Cells are the building blocks of a plant's framework and Silicon can increase the rigidity of plant cell walls and thickness of the protective cuticle. Stronger cells form thicker stems, trunks and branches to better support larger crops of grains, seeds and fruits, helping farmers reach closer to full expression of genetic potential. As stems and trunks grow thicker, the diameter of water-conducting vascular tissues also increases. This directly benefits the uptake and transport of more water and more nutrients to the canopy, helping to increase photosynthetic efficiency. Silicon also plays a major role in extending Phosphorus availability by releasing Phosphorus reserves bound-up as insoluble Aluminium, Iron and Calcium complexes and unavailable to crops. Silicon exchanges with the locked-up Phosphorus on these complexes making the P available to crops once again. Plants adequately supplied with Silicon also express increased tolerance (resilience) to various environmental stresses and pathogenic fungi such as grey mould and powdery mildew. Silicon is the trigger for Induced Systemic Resistance (utilising the immune system of plants) and a huge benefit of using BioGuano™ fertilisers with plant-available Silicon.



BioGuano[™] supplies plant-available Silicon to your farm soil & crops.

BioGusino

BioGuano™ liquid fertiliser is a rich source of natural Phosphorus, Calcium, Silicon, Organic Carbon and Ocean Minerals complexed with Ascophyllum nodosum (Kelp) and biologically active Fulvic acid to help build strong, resilient, high-yielding crops and stimulate beneficial biology in the soil and on plant surfaces.

Available Sizes:

• 15 L Pail	48 per pallet
• 1000 L IBC	1 per pallet
• Larger sizes avail	able upon request

Typical Analysis

% w/v	
Calcium (as Phosphate)	22.0%
Phosphorus	9.95%
Citrate Soluble	7.43%
Water Soluble	1.04%
Citrate Insoluble	1.48%
Total Organic Carbon	2.13%
Magnesium	1.80%
Potassium	0.67%
Sulphur	0.22%
Sodium	0.19%
Nitrogen (Organic)	0.03%

Trace Minerals

ppm w/v

Silicon	5559
Iron	1333
Manganese	459
Zinc	112
Boron	13.2
Copper	2.84
Cobalt	0.61
Molybdenum	0.21
Conductivity (µs/cm)	7,600
Specific Gravity	1.43
рН	7.4



APPLICATION RATES

Fertigation: 10 L/ha as required.

Soil Ameliorant: 15-30 L/ha as required.

Liquid Inject:

2-5 L/ha. Use a minimum dilution rate of 1 part product to 3 parts water. Application rate will depend on crop, row spacing and soil type. Always consider current soil test results when selecting a crop starter application rate. Natural plant bio-stimulants in BioGuano[™] formulation will improve germination time and uniformity.

Foliar Spray:

Broadacre Crops, Cereals & Legumes:

2 to 4 L/ha per minimum of 75 L of water. For high application rates increase to 100 L of water.

Vegetables:

2 L per minimum of 300 L of water up to 5 L/ha equivalent. Apply weekly or as required.

Lucerne & Pasture:

2 to 6 L/ha per minimum of 75 L water. For high application rates increase to 150 L of water.

Orchards, Berries & Vineyards:

3 to 5 L per minimum of 300 L water up to 10 L/ha equivalent. Apply every 4-6 weeks or as required.

Ornamentals & Turf:

4 L per minimum of 300 L water up to 10 L/ha equivalent.

Spot-spraying Applications or Small Areas and Newly-Planted Trees, etc:

4-5 mL/litre of water to cover 1 m². Can be applied as a foliar and soil-directed spray at label rates with complete safety to crops. Repeat every 2-4 weeks or as required.

Storage & Handling:

Store out of direct sunlight in a cool, dry area. After transit or extended storage, may require vigorous stirring and/or filtering before tank mixing. DO NOT store in diluted form.

Caution:

BioGuano[™] has a high specific gravity and is heavy. Lift with care to avoid personal injury.

DO NOT swallow or ingest the concentrate.

The spray of this product may act as an irritant. Avoid inhalation and contact with eyes and skin.





BioGuano™ KMS liquid fertiliser fortified with Potassium, Magnesium and Sulphur in addition to the full spectrum of nutrients available in all powder and liquid formulations. This enhanced formulation will further support crop growth through efficient photosynthesis and improved plant metabolic activity.

Available Sizes:

• 15 L Pail	48 per pallet
• 1000 L IBC	1 per pallet
• Larger sizes avai	able upon request

Typical Analysis

% w/v

Calcium (as Phosphate)	21.3%
Phosphorus	9.86%
Citrate Soluble	7.72%
Water Soluble	0.99%
Citrate Insoluble	1.15%
Total Organic Carbon	1.76%
Magnesium	1.94%
Potassium	2.52%
Sulphur (as Sulphate)	1.58%
Sodium	0.27%
Nitrogen (Organic)	0.03%

Trace Minerals

ppm w/v

PP	
Silicon	3480
Iron	2380
Manganese	457
Zinc	88
Boron	19.8
Copper	3.13
Cobalt	0.66
Molybdenum	0.29
Conductivity (µs/cm)	43,367
Specific Gravity	1.50
рН	7.1



APPLICATION RATES

Fertigation: 10 L/ha as required.

Soil Ameliorant: 15-30 L/ha as required.

Liquid Inject:

2-5 L/ha. Use a minimum dilution rate of 1 part product to 3 parts water. Application rate will depend on crop, row spacing and soil type. Always consider current soil test results when selecting a crop starter application rate. Natural plant bio-stimulants in BioGuano[™] formulation will improve germination time and uniformity.

Foliar Spray:

Broadacre Crops, Cereals & Legumes:

2 to 4 L/ha per minimum of 75 L of water. For high application rates increase to 100 L of water.

Vegetables:

2 L per minimum of 300 L of water up to 5 L/ha equivalent. Apply weekly or as required.

Lucerne & Pasture:

2 to 6 L/ha per minimum of 75 L water. For high application rates increase to 150 L of water.

Orchards, Berries & Vineyards:

3 to 5 L per minimum of 300 L water up to 10 L/ha equivalent. Apply every 4-6 weeks or as required.

Ornamentals & Turf:

4 L per minimum of 300 L water up to 10 L/ha equivalent.

Spot-spraying Applications or Small Areas and Newly-Planted Trees, etc:

4-5 mL/litre of water to cover 1 m². Can be applied as a foliar and soil-directed spray at label rates with complete safety to crops. Repeat every 2-4 weeks or as required.

Storage & Handling:

Store out of direct sunlight in a cool, dry area. After transit or extended storage, may require vigorous stirring and/or filtering before tank mixing. DO NOT store in diluted form.

Caution:

BioGuano[™] has a high specific gravity and is heavy. Lift with care to avoid personal injury.

DO NOT swallow or ingest the concentrate.

The spray of this product may act as an irritant. Avoid inhalation and contact with eyes and skin.



Bio Gusino 6000 UFP

BioGuano™ 6000UFP has all the benefits of BioGuano[™] liquid fertiliser in a dry, ultra-fine powder for on-farm mixing and application. Reduced packaging and more concentrated to improve the economics of using Guano fertiliser.

Available Sizes:

• 25 kg Kraft Bag	48 per pallet
• 500 kg Bulk Bag	2 per pallet

Typical Analysis	
% w/w	
Calcium (as Phosphate)	30.3%
Phosphorus	15.7%
Citrate Soluble	6.18%
Water Soluble	0.71%
Citrate Insoluble	8.88%
Total Organic Carbon	1.34%
Magnesium	2.34%
Potassium	0.19%
Sulphur	0.39%
Sodium	0.26%
Nitrogen (Organic)	0.04%

Trace Minerals

ppm w/w

Silicon (available)	155
Iron	1787
Manganese	404
Zinc	117
Boron	15
Copper	6
Cobalt	1
Molybdenum	0.16
Particle Size (average)	5 µm
Bulk Density 700-75	0 kg/m ³
рН	7.45



APPLICATION RATES

Fertigation:

8-10 kg/ha as required. Application frequency may change depending on the crop and soil fertility.

Soil Ameliorant:

5-10 kg/ha as required.

Liquid Inject:

2-5 kg/ha. Use a minimum dilution rate of 1 part product to 3 parts water. Application rate will depend on crop, row spacing and soil type. Always consider current soil test results when selecting a crop starter application rate.

Foliar Spray:

Broadacre Crops, Cereals & Grain Legumes, Lucerne & Pastures: 2-5 kg/ha in 60-120 litres of water depending on canopy development at time of application. Repeat this application as often as required ideally after monitoring soil or leaf nutrient levels.

Vegetables:

1 kg per 100 litres water up to a maximum of 7 kg/ha.

Orchards, Berries & Vineyards:

1 kg per 100 litres water up to a maximum of 7 kg/ha.

Ornamentals & Turf:

1 kg per 100 litres water up to a maximum of 7 kg/ha.

Spot-spraying Applications for Small Areas and Newly-Planted Trees, etc:

2-3 g/litre of water to cover 1 m². Can be applied as a foliar and soil-directed spray at label rates with complete safety to crops. Repeat every 2-4 weeks or as required.

Storage & Handling:

Store out of direct sunlight in a cool, dry area. Use soon after mixing with water and DO NOT store in the diluted form.

Caution:

Always lift with care to avoid personal injury.

DO NOT breathe, swallow or ingest the powder. The dust and diluted spray from this product may act as an irritant. Avoid inhalation and contact with eyes and skin.

Avoid windy conditions when adding product to the tank.

Reasons why you should farm with BioGuano[™] fertilisers:

The ocean is a mineral soup and saltwater fish assimilate a rich variety of these minerals before being eaten by generations of seabirds. Seabird droppings concentrate these essential plant nutrients, mixed with beneficial microbes, that biologically transform BioGuano[™] into the perfect plant food.

- BioGuano[™] fertilisers supply plant-available Silicon that helps release Phosphorus for plant uptake from fixed Iron, Aluminium and Calcium phosphate complexes.
- The combination of Phosphorus, Calcium and Silicon in BioGuano[™] fertilisers helps grow resilient, high Brix crops leading to increased capacity to better tolerate environmental and biotic stresses.
- Being Nitrate-free, BioGuano fertilisers can be used mid to late season to manage quality and shelf-life of high value horticultural crops.
- BioGuano fertilisers, conveniently available in powder or liquid concentrates are suitable for cost-effective application by liquid inject, fertigation and foliar sprays from planting to maturity.
- Certified organic or naturally based, BioGuano[™] fertilisers are economically viable for organic, biological or conventional farming methods.
- BioGuano[™] is microbe-friendly and assists with establishment of mycorrhizal colonies.

