Global game-changer: an Australian company that offers it all:

- Reduces & Mitigates GHG Emissions (Part A)
- Increases Soil Carbon (Part A)
- Increases Food Security (Part B)
- Increases Farmer Returns (Part B)

Agripower Australia Ltd would like to introduce Agrisilica®- a powerful opportunity to support Climate Smart Agriculture. It is the most significant change to fertilisers and fertilizer management in 90 years.

The following is only a brief introduction to the extraordinary benefits that Agrisilica® that offer the future of Climate Smart Agriculture (CSA) in the 21st century.

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Part A :

Reduces & Mitigates GHG Emissions and Increases Soil Carbon

Agriculture: largest contributor of *non*-CO_2 GHG's at 56%.[1]

How about an agri-product that

1. reduces emissions
2. boost soil carbon
3. increases yield
4. Increases profit?

[1] FAO; Smith, P. et al. Chapter 11 - Agriculture, forestry and other land use (AFOLU) In Climate Change 2014: Mitigation of Climate Change, IPCC Working Group III Contribution to AR5 (Cambridge University Press, 2014)

Plant Available Silicon (PAS)

Plant Available Silicon (PAS), basis of Agripower's revolutionary product Agrisilica®, is derived from amorphous silica. There are essentially, 2 types of Silicon:

- Crystalline (has structure)
- Amorphous (no structure)

1. **PAS is the key to unlocking the benefits of silicon to agriculture.**
2. **PAS, naturally derived, is safe for humans, animals and critically, the environment.**

The science around PAS reveals a number of extraordinary agri-benefits, both direct and indirect.

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Agriculture's holy grail.

"If we treat soil carbon as a renewable source, we change the dynamics"

Thomas J Goreau
Biogeochemist and expert
on carbon and nitrogen cycles

CO_2 & Soil Carbon.

Remember school science and photosynthesis, the way plants grow and thrive by absorbing CO_2 from the atmosphere and exude clean Oxygen, O_2?

1. CO_2 is considered a greenhouse gas and a major contributor to climate change.
2. 133 billion tons of carbon have been lost from the top 2 meters of world's soil through agriculture[1].
3. Having **more crops** take in **more CO_2**, exuding **more clean Oxygen** is a good thing, yes?
4. So - if CO_2 has been absorbed by plants and only O_2 exuded, **where has the carbon, C, gone**?
5. Into **the soil.** It's been sequestered.

In other words we have renewed soil carbon. How…?

1. Sanderman, J. et al. (2017) Soil carbon debt of 12,000 years of human land use, Proceedings of the National Academy of Sciences

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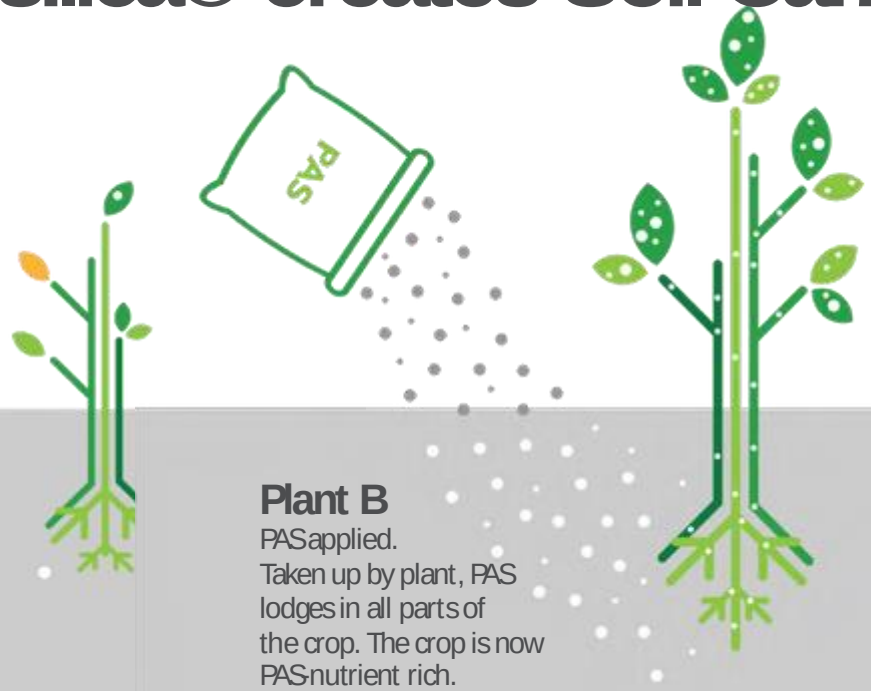
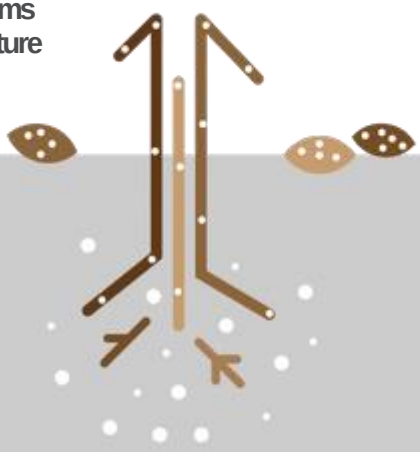
Agrisilica® creates Soil Carbon & Reduces CO_2



Silicon Phytoliths

PAS - absorbed by crops during lifetime, become rigid silicon forms called phytoliths. Phytoliths capture and store carbon (C).



Plant A

Relies only on what PAS may be naturally available in soil.
Sand is crystalline silicon.
It does not provide PAS.

Plant B

PAS applied.
Taken up by plant, PAS lodges in all parts of the crop. The crop is now PAS-nutrient rich.

Plant B

Plants and crops return carbon to the soil as roots and vegetative matter .

Plant A

Most soils contain low levels of PAS. Crops return Carbon to the soil through roots and recycling of vegetative matter, however there is often a net loss of soil carbon and more Carbon is exported off farm as produce and losses from soil erosion leading to:
Soil carbon being reduced.

Plant B

PAS boosts PHOTOSYNTHESIS meaning:

- More CO_2 is absorbed: GHG reduction
- Plant mass is greater: more CO_2 absorbed
- More, clean O_2 is released.

Where has the C gone?

Plant B

The more PAS a crop takes up the more C the crop sequesters.
It stores this C in PAS Phytoliths which can store C for thousands of years.
The more PAS a plant is given = more plant mass = more stored C goes back into the soil = soil carbon.

Soil carbon is created.

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N_20, CH_4 and Rice. Agriculture's big GHG challenges.

CH_4 is 84x more potent than CO_2

N_2O is 300x more potent than CO_2

N_2O – Nitrous Oxide
CH_4 – Methane
CO_2 – Carbon Dioxide

Agriculture accounts for 80% of global N_2O emissions mainly from fertilizer application

McKinsey & Co, Agriculture and Climate Change, 2020

50%+ of applied Nitrogen lost via leaching, animal waste and run-off

The Conversation Dec 5, 2016

Agriculture is the largest contributor of non-CO_2 GHG's at 56%

Smith, P. et al. Chapter 11 - Agriculture, forestry and other land use (AFOLU) In Climate Change 2014: Mitigation of Climate Change, IPCC Working Group III Contribution to AR5 (Cambridge University Press, 2014).

CH_4 from global rice production accounts for ~50% of crop GHG's

Kritee Kritee et al, PNAS September 25, 2018 115 (39) 9720-9725; first published September 10, 2018

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“Up to 90% of climate impact from an individual rice farm in the Indian subcontinent can be mitigated through co-management of nitrogen fertilizers… “ (Kritee et al)

N_2O annual global emissions from rice farms under intense forms of intermittent flooding could be … equivalent to annual CO_2 emissions from about 200 coal power plants. Environmental Defense Fund, NY 2019

N_2O together with estimates of CH_4 annual emissions could see net climate impact from global rice production equivalent to
600 medium sized coal power plants (~1,500-1,930 MMT CO_2-e100). Environmental Defense Fund, NY 2019

20 years of rice production’s GWP* could equal 1,200 coal plant emissions

Environmental Defense Fund, NY 2019
* Global warming potential

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The application of PAS to soil can reduce greenhouse gas emissions and reduce the impact of global climate change on agriculture.[1]

Scientific trials confirm

1. The application of PAS reduces N_2O emissions.[1]
2. PAS in fertiliser management systems provides more complete denitrification process[1]
3. Addition of a PAS fertilizer decreased N_2O emission rates and denitrification potential by 32.4–66.6 and 22.0–59.2%, respectively..[2]
4. PAS fertilisation during rice growth may serve as an effective approach to decreasing N_2O emissions.[2]

1 Włodarczyk T, Balakhnina T, Matichenkov V, Brzezińska M, Nosalewicz M, Szarlip P, Fomina I. Effect of silicon on barley growth and N_2O emission under flooding. Sci Total Environ. 2019 Oct 1;685:1-9. doi: 10.1016/j.scitotenv.2019.05.410. Epub 2019 May 29. PMID: 31170590.

2 Song, Alin & Fan, Fenliang & Yin, Chang & Wen, Shilin & Zhang, Yalei & Fan, Xiaoping & Liang, Yongchao. (2017). The effects of silicon fertilizer on denitrification potential and associated genes abundance in paddy soil. Biology and Fertility of Soils. 1-12. 10.1007/s00374-017-1206-0.

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Agrisilica® has delivered in every trial. PAS increases grower profitability, increases crop resilience, increases yield and crop quality, and reduces emissions.

Rice:

- Reduced combined global warming potential (GWP) of CH_4 and N_2O = net effect reduction of GHG emissions
- Increased nitrogen (N) fixation = reduced leaching and N_2O emissions
- Promotes ammonium assimilation = reduced N_2O emissions

Barley:

- Increased denitrification process = reduced N_2O emissions
- Improved availability and efficiency of silicon as nutrient = major reductions in N_2O emissions.

Sugarcane:

- Increased photosynthesis which;
- Reduces transpiration, which increases nutrient uptake which;
- Increases phosphate and potassium uptake by 40-70% and 20% respectively, all of which combine to...

Reduce N_2O losses by as much as 40%

Nitrogen loss can cost farmers up to 25% annual income

The Conversation Dec 5, 2016

PAS reduces crop N_2O emissions; fixates N_2O which reduces emissions; & enables more N_2 uptake by crops.

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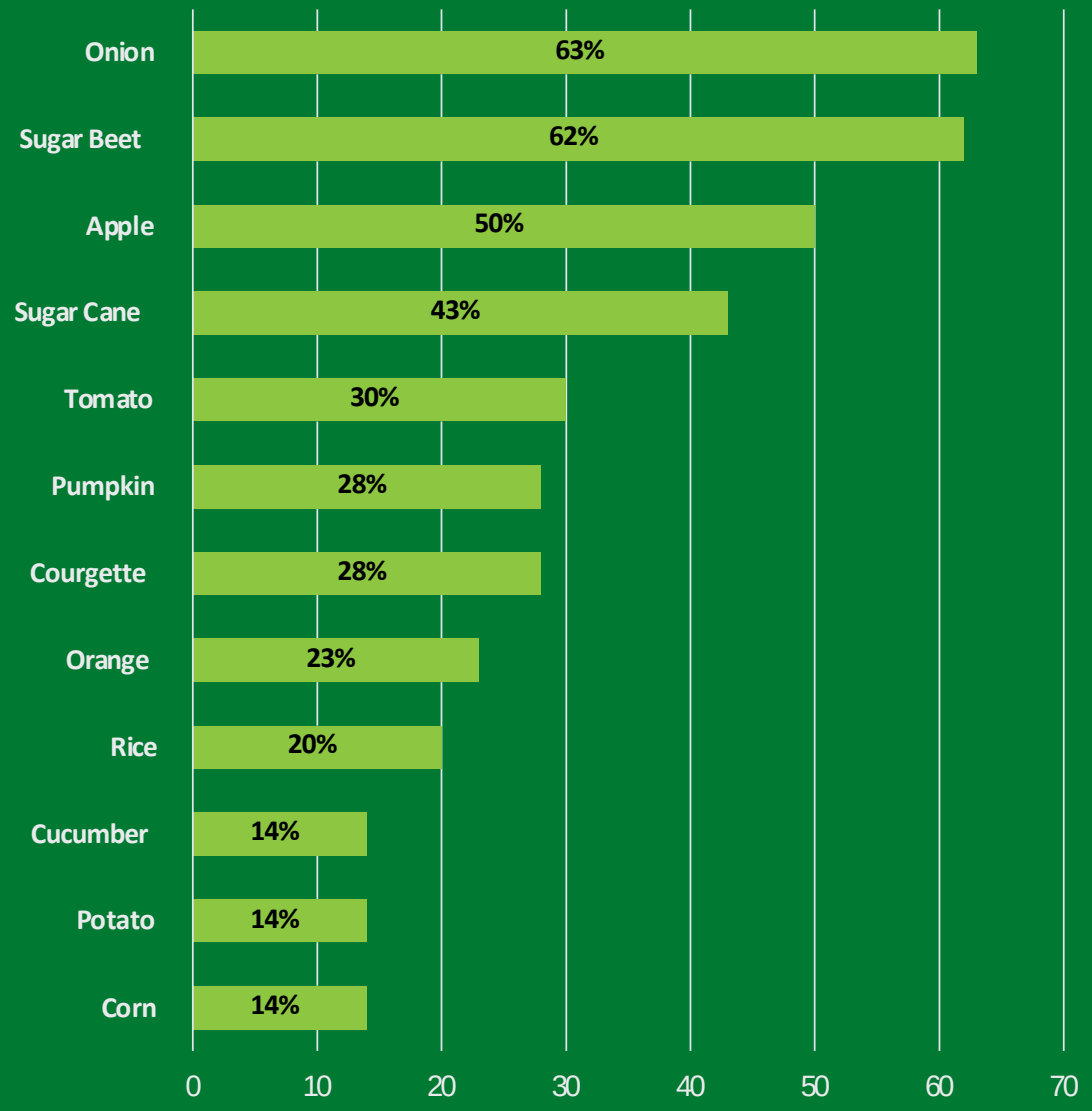
Part B :

Increases Food Security by Increasing Yield, Reducing Crop Stress Losses & Improves Food Safety.

Agrisilica®
Proven to increase yield & quality

1. Reduces under-sizing in crops
2. Increases crop weight
3. Disease incidence lowered
4. More premium quality crops
5. Longer crop shelf life
6. Increased nutritional value
7. Organic agriculture use approved
8. Versatile application range: broadacre, tree crops, hydroponic, nurseries, viticulture, turf production & remediation etc.



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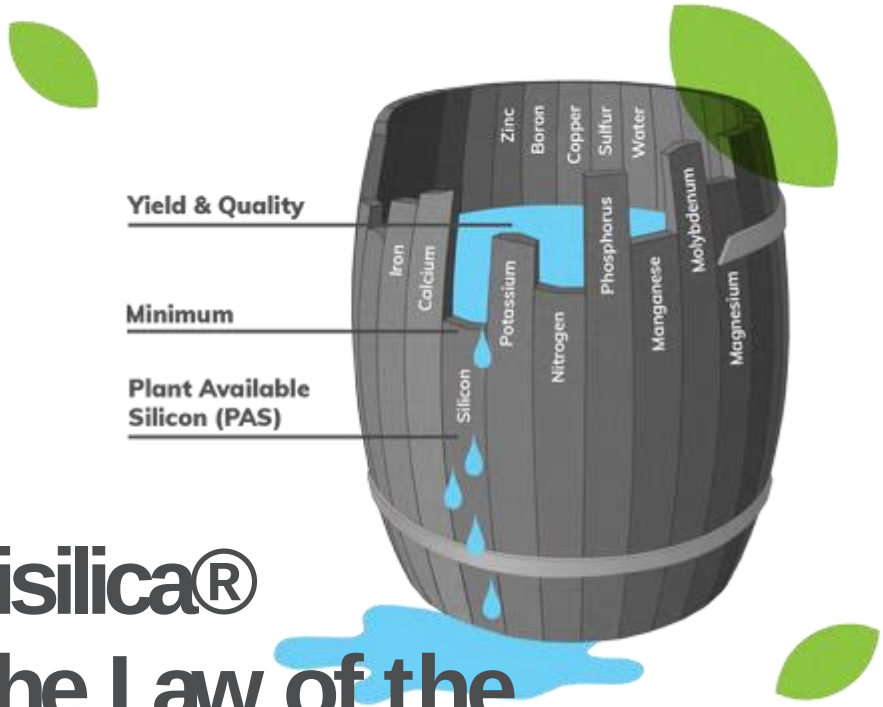

Agrisilica® & The Law of the Minimum

PAS is required in macro quantities similar to NPK for optimum crop results. Crop health (growth, resilience etc) will be determined by the nutrient or resource in least supply, ie: crop yield and quality will be diminished if any nutrient is reduced.

Agrisilica® returns benefits to growers many times over

1. Increased yield & quality – improved income
2. Reduced crop stress losses – improved income
3. Improved crop quality/size – improved income
4. Reduced water usage – lower costs
5. Reduced pesticide usage - lower costs
6. Increased safety to grower & consumer
7. Improved soil condition & fertility
8. Improved triple bottom line

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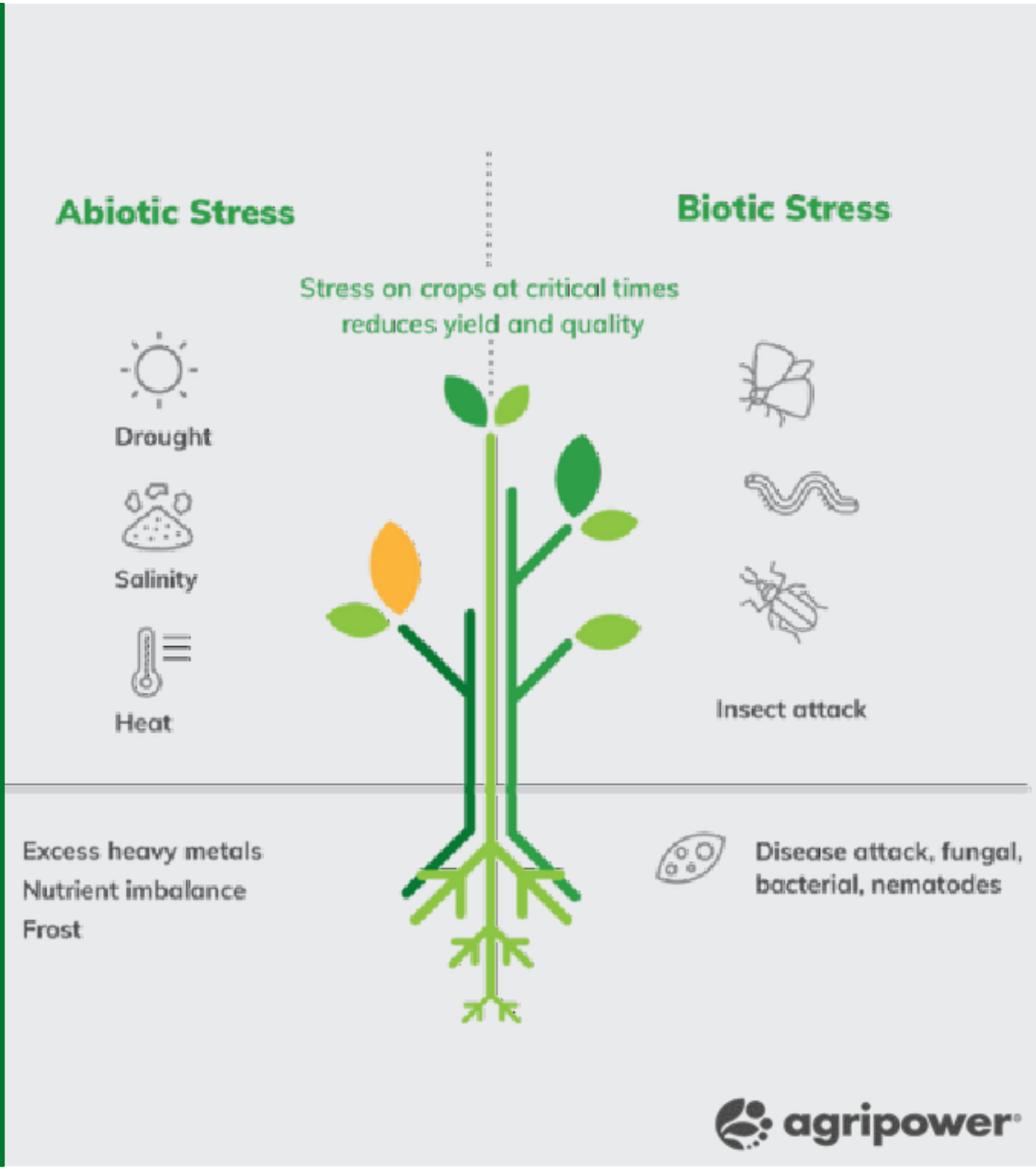
PAS reduces crop stress – food security cannot sustain 51%-82% annual global losses

- Increases photosynthesis
- Increases cell strength making plant less palatable to insect attack
- Strengthens / improves vascular capacity (water & nutrient optimisation)
- Reduces uptake of and resistance to toxicities (salt, heavy metals)
- Prevents lodging
- Increases soil health, CEC,moisture retention (without waterlogging), optimises soil organic carbon & humic acid



- Decreased metal concentration
- Compartmentation

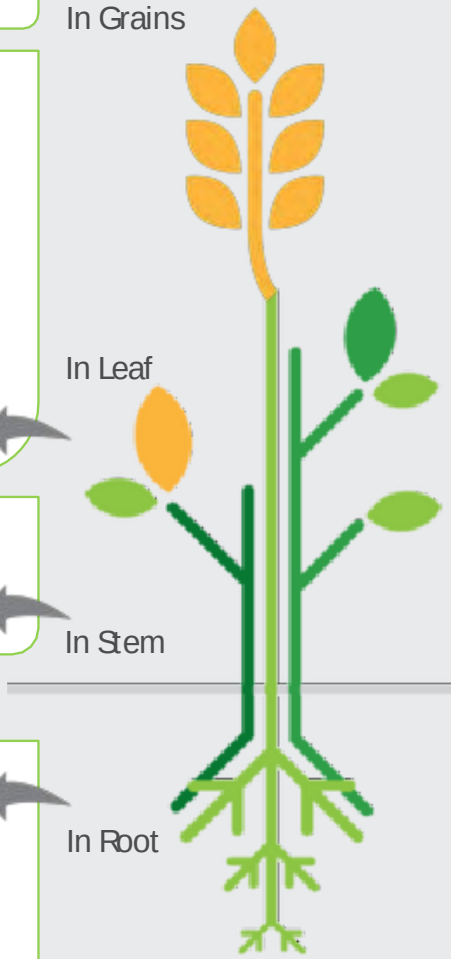
In Grains

- Increased photosynthetic pigments
- Reduced oxidative stress
- Increased level of antioxidants
- Increased stomatal frequency
- Increased leaf number & width
- Increased biomass
- Co-precipitation of Si with metals
- Decreased metal concentration
- Chelation of metals with ligands
- Homogenous distribution of metals in leaves

In Leaf

- Increased xylem sap
- Decreased metal concentration in sap
- Metal immobilization in stem

In Stem



- Reduced metal uptake
- Immobilization in root apoplasm
- Increased mineral uptake
- Increased root growth & biomass
- Reduced oxidative stress
- Increased antioxidant enzymes
- Increased root hair frequency
- Increased length & width of roots

In Root

- Increase in soil pH
- Complex formation in soil
- Change speciation in the soil solution

In Soil

Addition of PAS to the soils with metal toxicity

PAS reduces Cd & As accumulation in crops by as much as 40% : reduces crop stress increases food safety

1, 2

"The decreased concentrations of these toxic elements together with an increase in Si in the edible parts are positive for human health." [1]

[1] Greger and Landberg (2015)
[2] Source of image: Adrees et al. (2015)

Cd – Cadmium
As – Arsenic

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Agriculture in the 21st century faces 6 key challenges

1. GHG Emissions
2. Soil health
3. Food security
4. Toxicity
5. Crop stress
6. Ecosystems

To find out how Agripower addresses these 6 key challenges for agriculture in synergy with the UN's Sustainable Development Goals (SDG's) and the Food and Agriculture Organisation's (FAO) 3 Pillars of Climate Smart Agriculture, **please ask for our brochure.**

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Few countries have achieved sustained economic growth without first developing their agriculture sector (OECD)

Agripower's Agrisilica® is related at a grass roots level to human food and beverage consumption.

The potential value of PAS in relation to crop and soil health has been championed by Agripower's founder and MD,
Peter Prentice who has been presenting extensively around the world educating government regulatory bodies, scientists, agronomists and growers on PAS and its significance to
global agriculture.

Agrisilica® can directly & indirectly contribute to 12 of the UN's 17 SDG's

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GROWING OUR FUTURE

Proudly Australian Global Citizen

For further information on:

- Agrisilica®& Agriculture's 6 key challenges (CSA, UN SDG's)
- Agrisilica® Crop Results
- B2B Opportunities
- Or other enquiries, please contact:

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