

Biostimulant Products: Cutting through the noise

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Image courtesy: Incitec Pivot Fertilisers

Fertilizer Australia

- Represents manufacturers, importers, distributors & associated service providers.
- Engage with government and other stakeholders, to develop & implement policies which support the responsible contribution of our industry to Australian agriculture



Image courtesy: Yara Aust

Fertcare

- Effective management of nutrient issues
- Improved ag productivity & profitability
- Provides a vehicle for the fertilizer industry to constructively engage with stakeholders
- Help fertilizer industry manage environment & food safety risks



Image courtesy: Incitec Pivot Fertilisers



Definitions - Fertilizer

- Provide essential nutrients for plant growth
- Replace nutrients removed when crops and animals are harvested



Image courtesy: Craigs Farming Photos

Definitions - Biostimulants

- a substance(s), microorganism(s), or mixtures
- applied to seeds, fertilizer, plants, the rhizosphere, soil or other growth media
- support a plant's natural nutrition processes independently of the biostimulant's nutrient content
- biostimulants can improve:
 - nutrient availability, uptake, or use efficiency,
 - tolerance to abiotic stress such as drought, salinity, or disease.
 - consequent growth, development, plant vigour, crop quality or yield.

Biostimulant categories

- Microbial (live or non-living microbes & their metabolites)
- Algal or plant extracts (Kelp)
- Complex carbon-base products
 - Humic substances (humic & fulvic acids)
 - Other (vermicompost, biochar)
- Protein hydrolysates (peptides, amino acids)
- Defined molecules purified from minerals, plants, animals, microbes or obtained by synthesis

Challenges

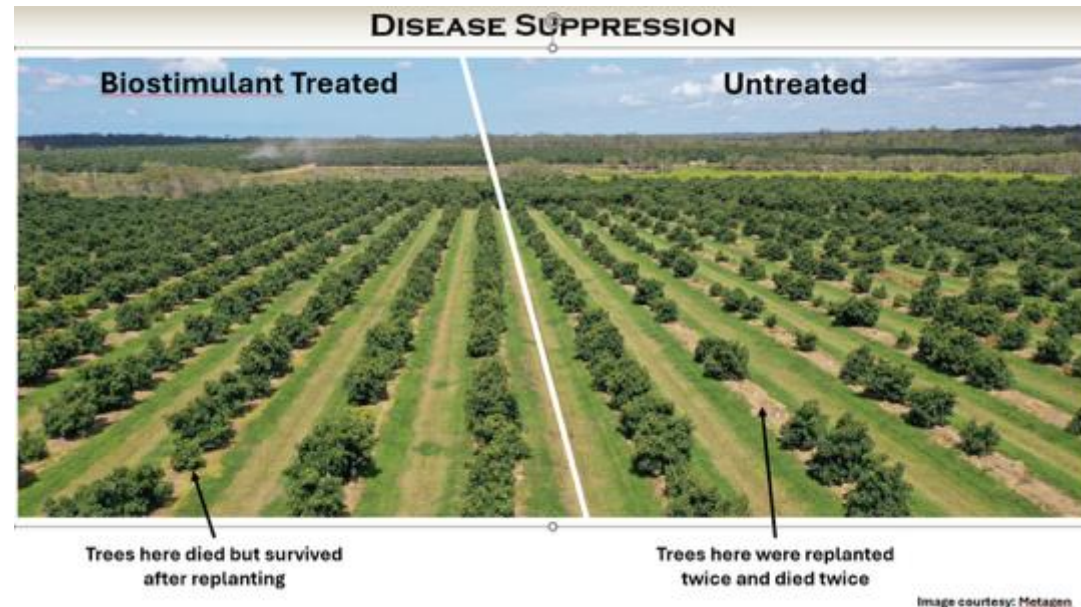
- Limited trials
- Lack of knowledge
- Lack of robust & relevant data collection



Image courtesy: Incitec Pivot Fertilisers

Macro Trends

- Growing demand for reduced chemical environments & more effective use of conventional inputs
- Biostimulants offer the possibility of
 - improved NUE
 - reduce crop stresses
 - increase productivity



Why create a biostimulant CoP?

- Some products promoted with little evidence
- Grower experiences have been mixed
- Biostimulants not covered by APVMA or State fertilizer regulations
- Need for transparency, label consistency, evidence and confidence around the use of these products



Image courtesy: Incitec Pivot Fertilisers

Key areas covered in CoP

Image courtesy: Incitec Pivot Fertilisers



- Active constituents
- Efficacy claims
- Application rates
- Compatibility (if claimed)
- Identification
- User safety
- Food safety

Active Constituent - Microbes

- State the genus and species
 - culturable cells: the number of colony forming units, per g or ml
 - Non-culturable cells: another descriptor of the concentration of that microorganism, or metabolite e.g. cells, spores or propagules, per g or ml
- Non target species <1%
- Claimed level should be the minimum concentration, or
- for microbials it may be stated as the minimum at manufacture date and minimum at use-by date.

Active Constituent – Humic substances

- State % humic acid or fulvic acid by gravimetric humic acid testing using the New Standardised Method (Lamar et al 2014).
- In addition, other established methods may be used to further characterise the fulvic acid fractions with the method stated.
- The claimed level should be the minimum concentration.



Efficacy Claims

- Claims must be capable of substantiation peer reviewed, published literature.
- Yield or quality claims must have experiments where appropriate biometric techniques have been used. The confidence level must be stated.
- State the number of trials & quoted literature.
- Experiments must control for covariates.
- Literature or experimental data should be based on comparable crops & cultural conditions to those for which the claim is made.

Key actions to date

- Fert Aust Board has endorsed the Biostimulant labelling CoP
- Fert Aust members marketing microbial products & humic substances asked to compare existing labels against the CoP
- New biostimulants webpage added to the Fert Aust website
- Activities to create awareness of CoP e.g. GRDC Updates
- Work has commenced on adding plant extracts & protein hydrolysate biotimulants to the CoP



Questions for suppliers

- Ask for evidence / relevant field trials with statistical analysis
- What are the situations where the product is likely to be of value & where is it unlikely to work?
- Has this product worked under my local conditions: similar soil type, crop, climatic conditions
- Check if the label complies with the CoP

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General Rules of Thumb

- Prefer products containing live organisms rather than extracts
(but avoid overly complex mixes with too many species)
- Check for a guaranteed analysis on the label → Know exactly what you're applying
- Choose fresh, stable products → Aim for shelf life of 18–24 months
- Avoid products that require refrigeration where possible → It is unclear if they got warm and degraded before you bought them.
- Follow label recommendations for ongoing applications → Supports consistent expression of beneficial effects in your crop



Farm trials

- Define the trial objective
- Soil test, paddock history
- Include control strips
- Consider replicating the treatments in different sections of the field
- Consider possible confounding effects
- Regularly monitor the trial & consider plant tissue test
- Measure yield &/or quality objectively



Image courtesy: Incitec Pivot Fertilisers



Key messages

1. Consider biostimulant products that meet the CoP i.e.
 1. Product is what it claims to be
 2. Has claims supported by a body of evidence
 3. Safe to users, crops, food consumers & environment
2. Ask product suppliers for the evidence the product works (well constructed trials)
3. If there are no well-designed trials available, should you be using the product?
4. Check product compatibility
5. Let others know about the CoP