Evidence Behind the Label

A Practical Guide to Biostimulant Testing



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Biostimulant CoP – Why?

- Biostimulants fall through the reg gap
- Claims with little evidence
- Need for:
  - Transparency
  - Label consistency
  - Evidence & confidence
- To increase adoption



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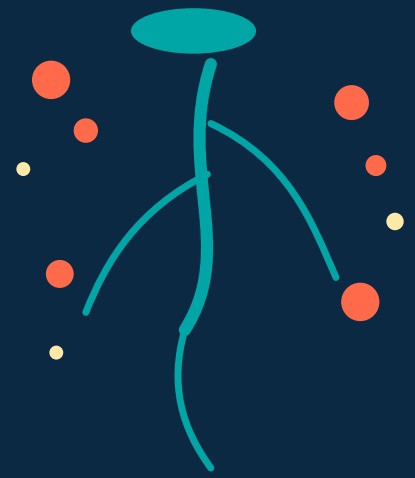
What does the ideal label look like?

EXAMPLE BIOINPUTS

ROOTWISE

Microbial Biostimulant

Powered by live microbes that increase root growth, improve nutrient availability and suppor higher biomass and yield.



NET CONTENTS
5 L Liquid concentrate

BN: RW2026-1224
MD: 20260131
EXP: 20270131

1 PRODUCT CONSTITUENTS

Cateogory: A - Microbial biostimulant

Bacillus velezensis strain EX-01

Minimum at manufacture: 1.0×10^9 CFU/mL

Minimum at use-by: 5.0×10^8 CFU/mL

Other species < 1%
Other ingredients include water and molasses. CFU/mL determined by selective plate count.

2 FUNCTION / EFFICACY

Live bacteria that stimulate plant root and shoot growth.
Improves soil health with bacteria enhancing soil fertility and nutrient availability.
Increased yield shown in a variety of crops and conditions.

ScanQR code to find study details.

3 APPLICATION RATES

Crop: Broadacre cereals and oilseeds **Rate:**1.0 L/ha
Method:in-furrow soil application **Timing:**at sowing
Frequency:one application **Withholding:**not required

Crop: Pastures **Rate:**1.0 L/ha
Method:foliar application **Timing:**after cut or grazing
Frequency: After each cut or grazin **Withholding:**not required

4 MIXING AND COMPATIBILITY

This product should be mixed only as per the directions for use unless compatibility with other products is listed in the online information.

ScanQR code to find compatibility details.

5 SAFETY AND STORAGE

Read the SDS. Follow GHS hazard classification and labelling.
Store sealed at 5–25 °C, away from sunlight.
Do not freeze.
Keep out of reach of children.
Batch tested against CoP user and food safety.

6 TRACEABILITY AND INFORMATION

Manufacturer: Example BioInputs Pty Ltd
Made in: Murdoch, WA 6150
Contact: info@examplebioinputs.com.au:

AUSTRALIAN MADE

Australian Certified Organic

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Efficacy claims

- MOA
  - Relevant, peer reviewed, published literature.
- Efficacy or performance
  - Substantiation
  - Confidence level
  - Number of trials, covariates controlled
  - Crop and climate
  - Supporting data:
    - L1: Greenhouse
    - L2: International field trials
    - L3: Australian field trials



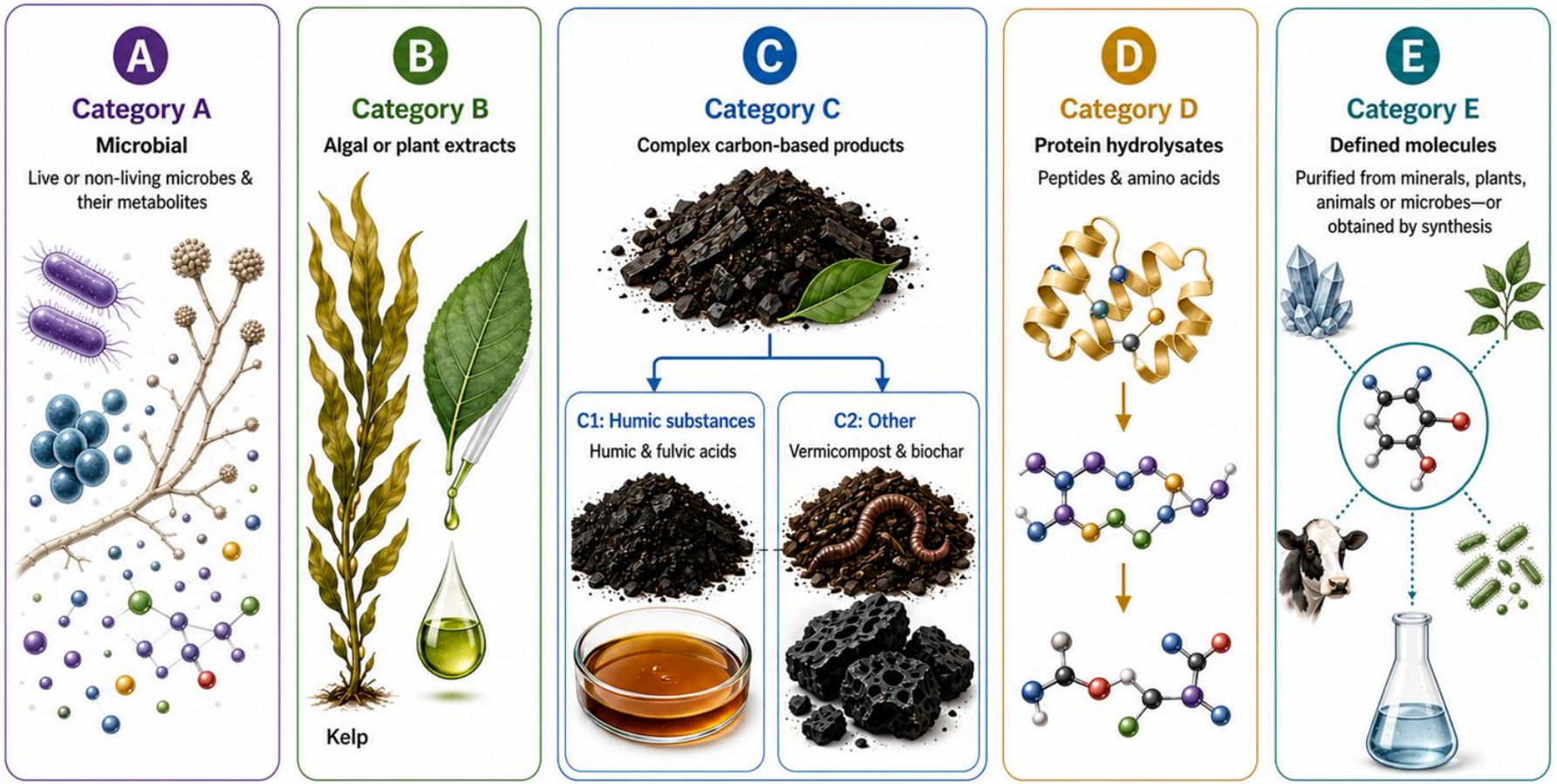
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Biostimulant categories



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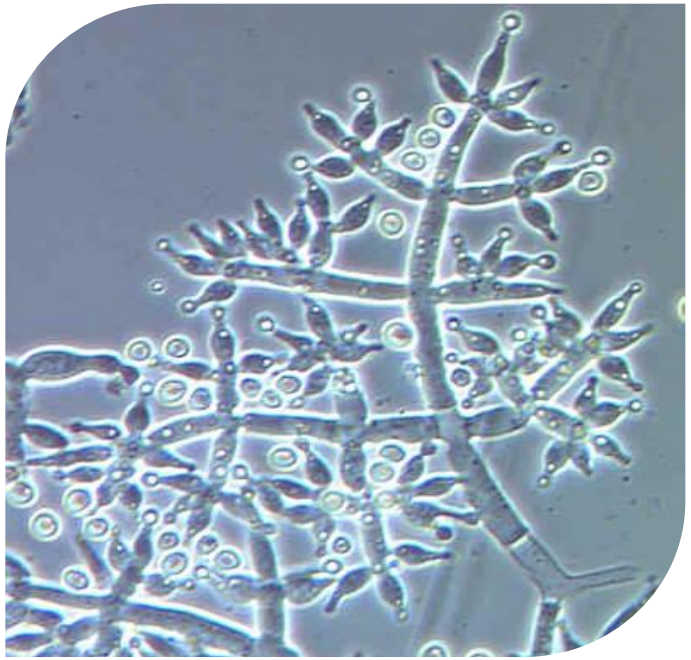
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Cat A. Microbials

- Live or dead microorganisms & their metabolites
- Category of product: “Microbial biostimulant”.
- Identify active ingredient:
  - State the genus & species of each microorganism.

    E.g.:- *Methylobacterium symbioticum.*

    - Iron-chelating/siderophore molecule harzianic acid derived from *Trichoderma harzianum* T-22.



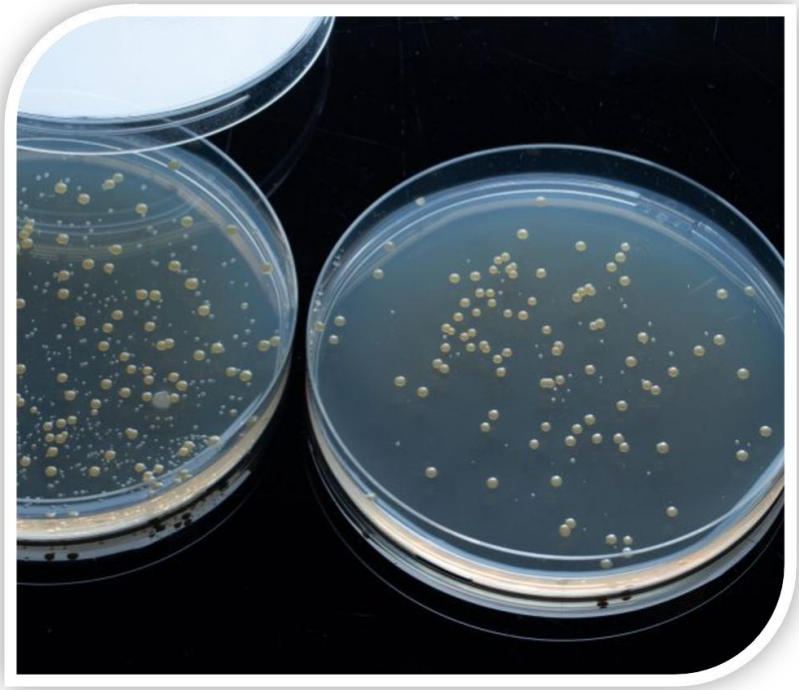
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Cat A. Microbials



- Concentration of viable cells:
- Culturables: the number of colony forming units per gram or millilitre (CFU/g CFU/mL).
- Unculturable: approximation of concentration.
  E.g.: cells/spores/propagules per gram or millilitre by quantitative or digital PCR.

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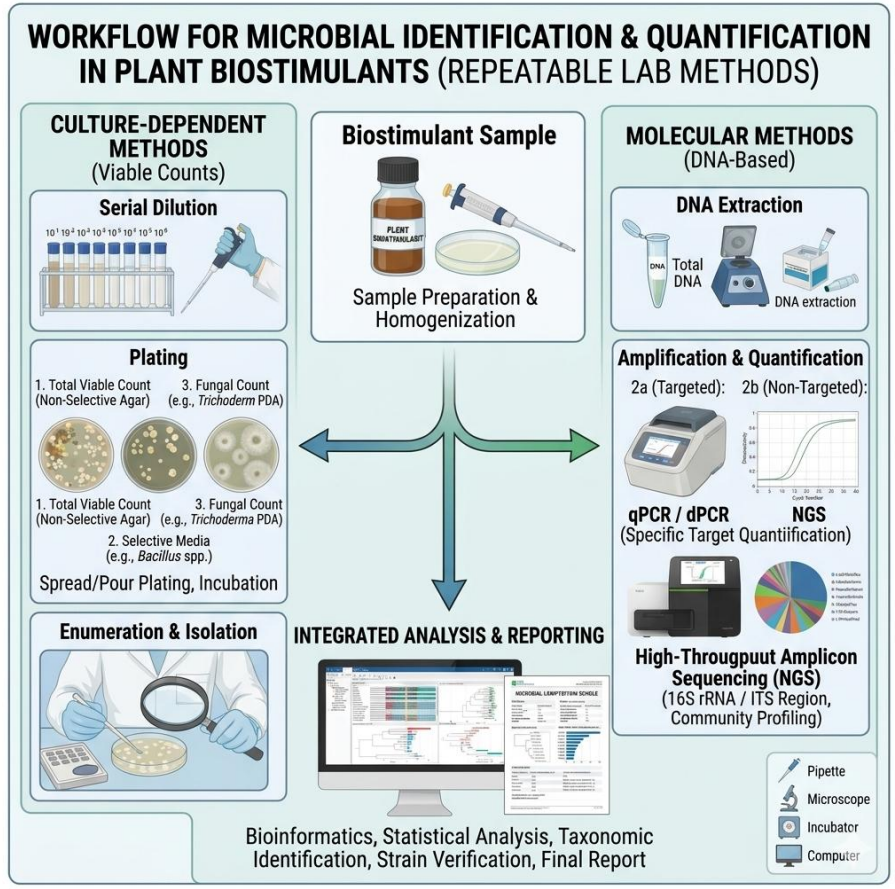
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Cat A. Microbials

- Methods of validation
- Must be well established.
- Repeatable under common laboratory conditions.
- Relevant to the active ingredient.
- In order of preference:
  - A published Australian Standard (Standards Australia)
  - An International Standard (ISO)
  - Handbook of Agricultural Microbiology by The Fertilizer Institute.
  - A published, peer-reviewed method.



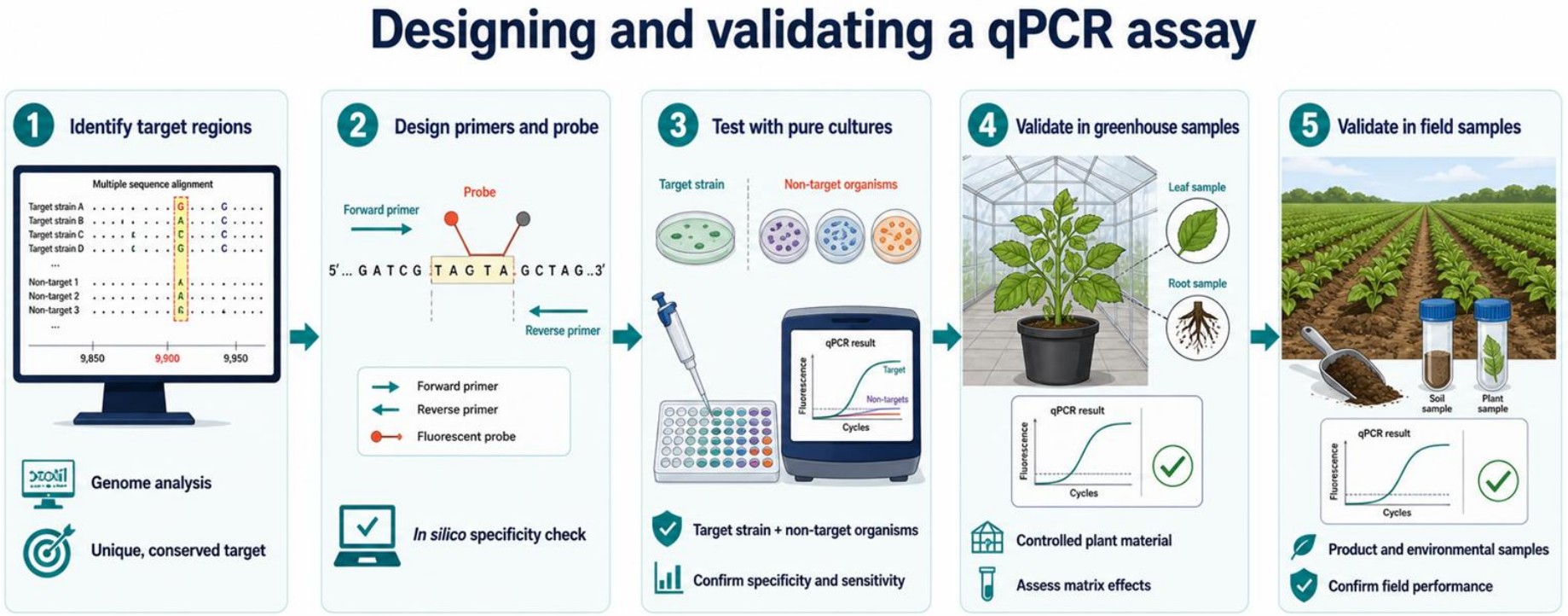
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Cat A. Microbials



Bioinformatics → Laboratory → Controlled environment → Real-world validation

Pros:

- High sensitivity & specificity.
- Culture-independent.
- Quantification of bioactivity potential.

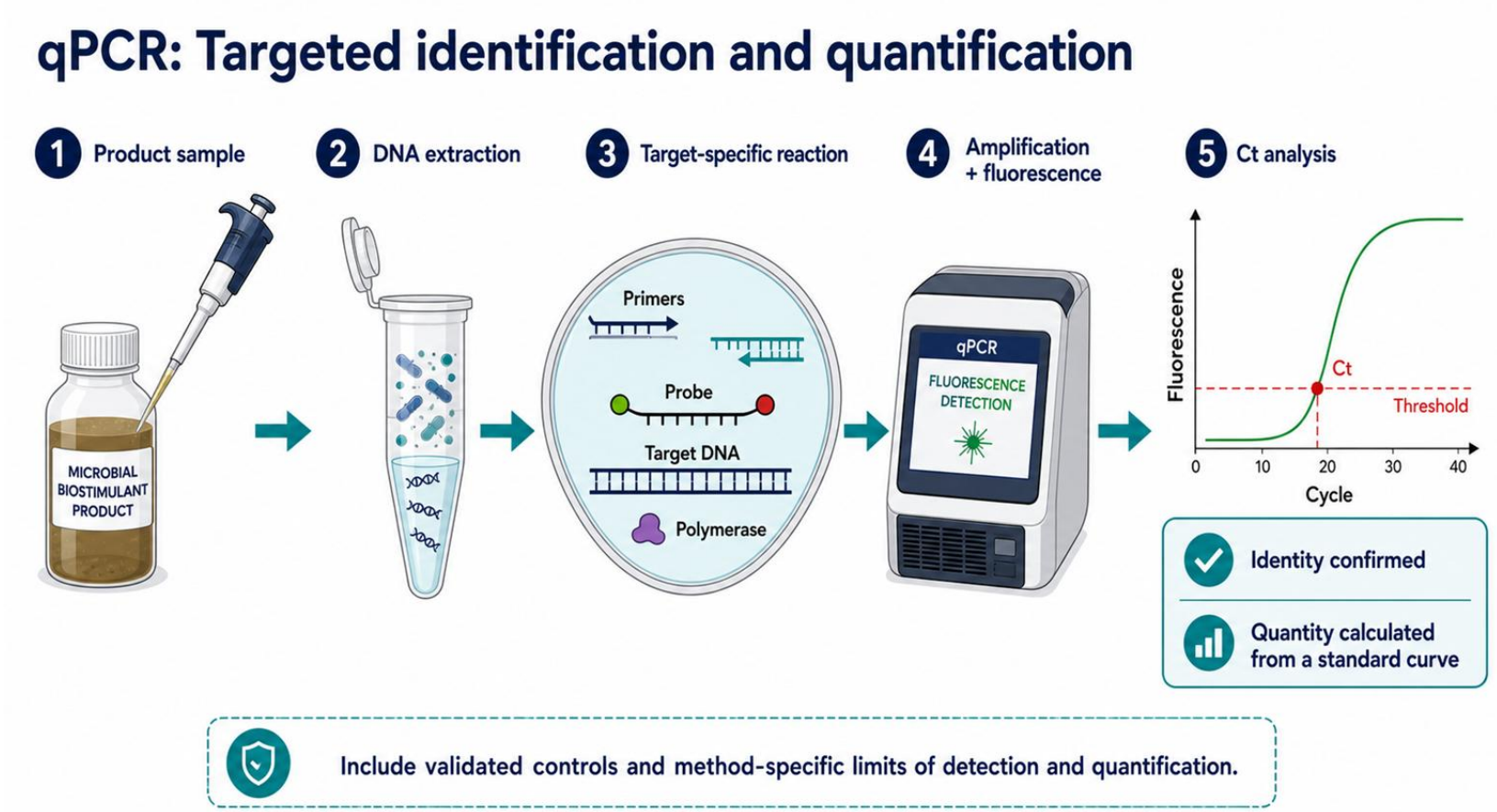
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Cat A. Microbials



Cons:

- Interference by inhibitors.
- Needs to develop assays for each target.
- Not a proof of function.

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Cat A. Microbials

- Safety claims
- Non-target organisms must be < 1%.
- Statement: “Other species < 1%”.
- Acceptable concentration for pathogens:
  - *Salmonella* spp. - absent in 25 g or 25 mL
  - *Escherichia coli* - absent in 1 g or 1 mL
  - *Listeria monocytogenes* - absent in 25 g or 25 mL
  - *Vibrio parahaemolyticus* - absent in 25 g or 25 mL
  - *Shigella* spp. - absent in 25 g or 25 mL
  - *Staphylococcus aureus* - absent in 25 g or 25 mL
  - *Enterococcaceae* - maximum 10 CFU /g or /mL
  - Yeast and molds - <1000 CFU /g or /mL



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Cat B. Seaweed & Plant extracts

- Genus & Species name
- Extraction method
- Nutrient composition (macro & micro)
- Any synthetic additives
- pH and SG or bulk density
- Optional active compounds



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Cat C1. Humic and Fulvic acids

- Min % Humic acid
- Min % Fulvic acid
- Using gravimetric method as per ISO 19822:2018 (Lamar et al 2014)



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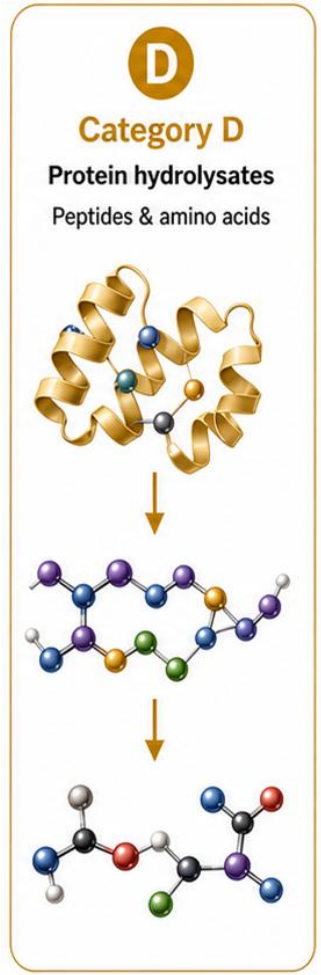
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Cat D. Protein hydrolysates

- Source material origin
  - Animal
  - Microbial
  - Microalgae
  - Plant
- Hydrolysis method
- Total or free amino acids using UPLC
- NPK and trace elements
- pH and SG



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Key messages

1. Consider biostimulant products that meet the CoP.
    i. Product is what it claims to be.
    ii. Has claims supported by a body of evidence.
    iii. Safe to users, crops, food consumers & the environment.
2. Ask for trial evidence.
3. Check product compatibility.



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How can you help?

- For farmers: ask your suppliers about CoP.
- For agronomists: learn about the different biostimulant products and how manufacturers meet the CoP.
- For Suppliers:
  - Become a member.
  - Implement the CoP.



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Find out more

Biostimulant labelling Code of Practice
https://fertilizer.org.au/biostimulant

or

Contact



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