Periodical Systems
MICROORGANISM CULTURE | TECHNICAL OVERVIEW

FORMULATION | SOIL MECHANISM | APPLICATION

Microorganism Culture

Nutrient medium for microbial growth

A technical guide to composition, controlled production, soil and plant pathways, application and quality evidence.

PRIMARY USE CONTEXT

Soil | roots | foliage | crop-input programs

FORMULATION | PROCESS | MECHANISM | USE

01 PRODUCT DEFINITION

What is the Culture Solution?

The product is a soluble nutrient medium diluted into crop programs to support microorganisms already present on leaves and in soil.

01	**What it is**	An algae- and yeast-derived matrix of amino acids, nucleotide products and soluble oligo- and polysaccharides.
02	**What it supports**	Resident bacteria, actinomycetes, fungi, algae and other members of the leaf- and root-zone microbiome.
03	**Product category**	The application guide describes a non-microbial, non-hormonal crop input used alongside basal and top-dressing fertilizer programs.

FUNCTIONAL ROLE Supplies soluble substrates to microorganisms already present on leaves and in soil.

02 FORMULATION

Formulation profile

The formulation combines complementary nitrogen and carbon sources.

NITROGEN-SIDE INPUTS

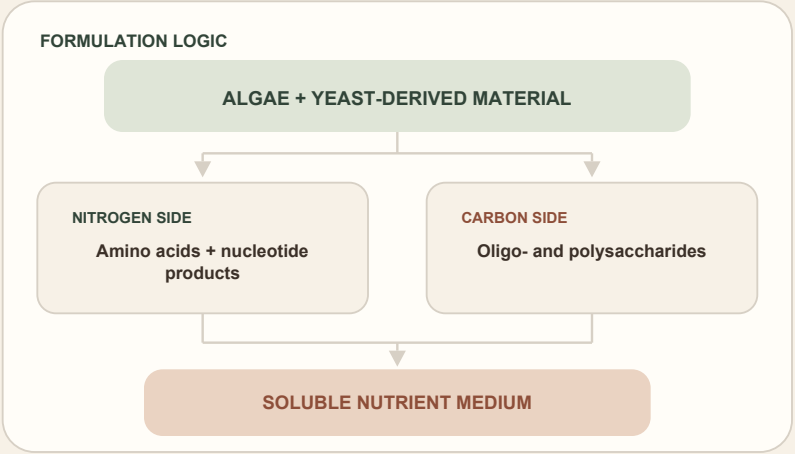
Amino acids + nucleotide products

The 2017 analysis identifies 18 hydrolyzed amino acids. The largest measured fractions were glutamic acid, alanine, aspartic acid, leucine and valine. Nucleotide breakdown products complete the nitrogen-side input.

CARBON-SIDE INPUTS

Soluble oligo- and polysaccharides

The carbohydrate fraction includes mannan, chitin, glucan, green-algae polysaccharides and seaweed polysaccharides. These materials function as microbial substrates and plant-response signals.



Formulation pathway

2017 ANALYTICAL SUMMARY 8.18% water-soluble polysaccharide

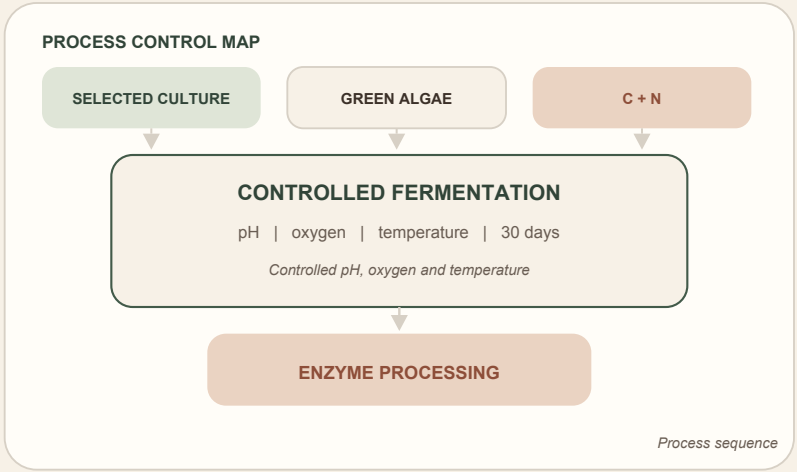
August 2017 analysis: 18 hydrolyzed amino acids reported.

03 PRODUCTION PROCESS

Controlled production sequence

Production combines selected culture material, green algae, carbon and nitrogen sources, controlled fermentation and enzyme processing.

01	**Selected culture**	Chosen biological starting material
02	**Green algae**	Algae-derived material is added
03	**Carbon + nitrogen**	Culture nutrients are supplied
04	**pH + oxygen**	Process conditions are controlled
05	**30-day fermentation**	High-temperature fermentation stage
06	**Enzyme processing**	Material is reduced toward smaller molecules



RELEASE CHECKS Composition, trace elements and screened metals

Source: Green Algae Polysaccharide presentation (Chinese archive).

Production process

04 SOIL CONTEXT

Why microbial nutrition matters

The product logic begins with conditions that can narrow microbial activity or disturb the balance of the root-zone community.

01

Excess fertilizer

Salt accumulation and acidification can constrain biological activity.

02

Pollution pressure

Water and air pollution can shift soil chemistry and microbial conditions.

03

Wet-dry rotation

Alternating paddy and dry cultivation changes oxygen conditions and community balance.

04

Continuous monoculture

Repeatedly growing one crop can reduce niche diversity and favor crop-specific pathogens.

PRODUCT ROLE Supply usable carbon- and nitrogen-side substrates to the existing microbial community.

05 SOIL MECHANISM

Root-zone functional sequence

The original deck connects microbial growth with nutrient cycling, soil aggregation and a larger effective root interface.

01 Substrate use

Resident microbes use amino acids, nucleotide products and soluble carbohydrates.

02 Nutrient cycling

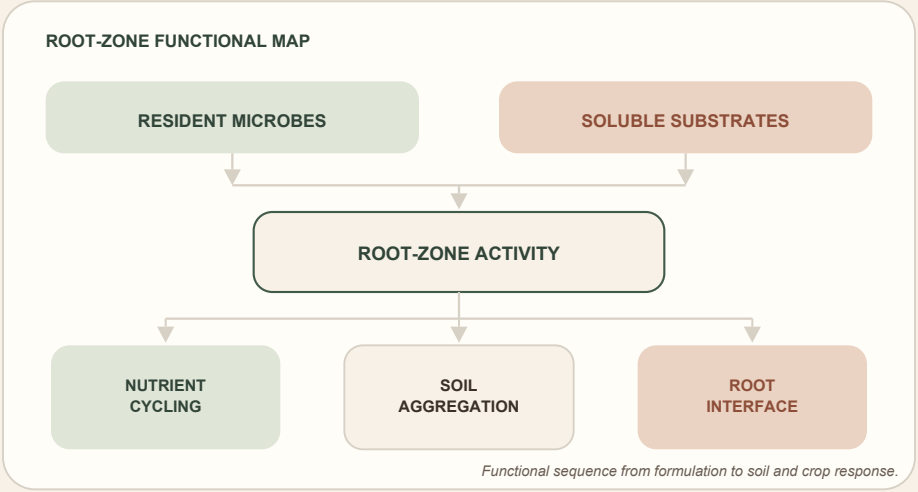
Decomposition, nitrogen fixation and phosphate solubilization can increase nutrient availability.

03 Soil structure

Microbial polysaccharides can support aggregation and the root environment.

04 Root interface

Root hairs and mycorrhizal networks expand the effective surface for water and nutrient acquisition.



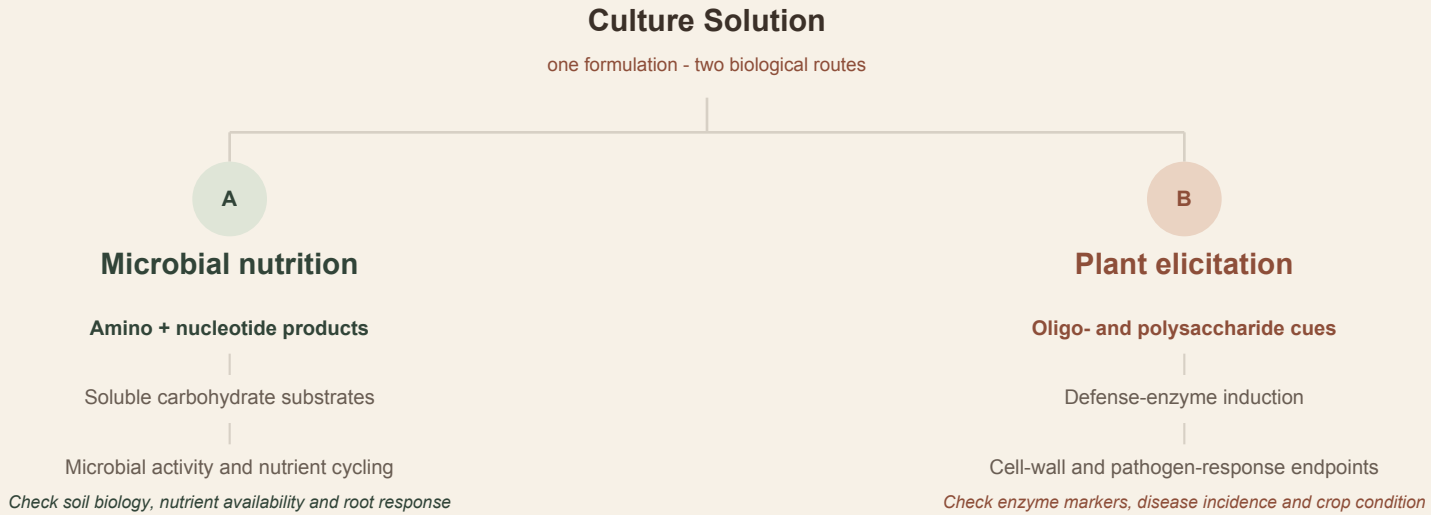
Functional sequence from formulation to soil and crop response.

FIELD VARIABLES Response depends on the resident community, soil chemistry and crop program.

06 FUNCTIONAL LOGIC

From formulation to field response

The formulation has two connected routes: microbial nutrition and plant-defense elicitation.



07 INDUCED RESPONSE

Plant-defense pathway

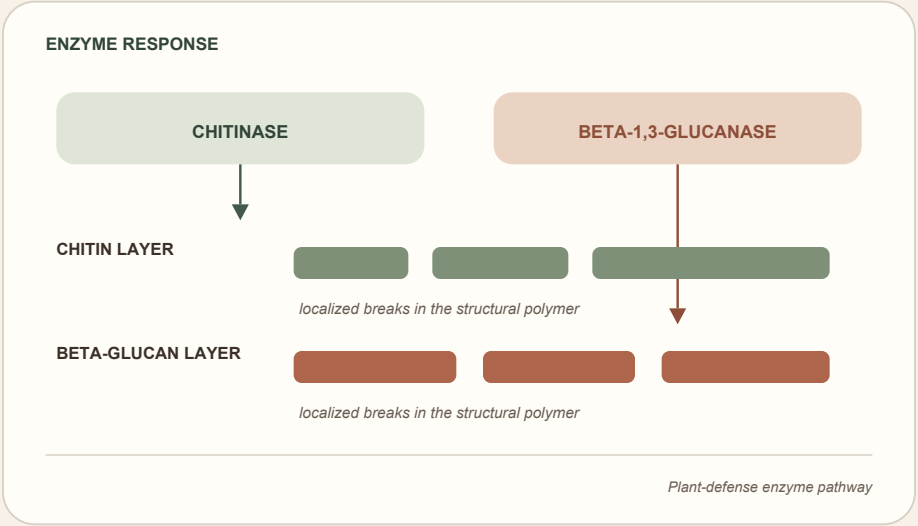
Oligo- and polysaccharides act as plant-response signals that activate defense-related enzymes.

01 Signal exposure
Oligo- and polysaccharide cues contact leaf or root tissue.

02 Defense activation
Plant cells increase pathogenesis-related proteins and defense enzymes.

03 Enzyme response
Chitinase and beta-1,3-glucanase target chitin and beta-glucan structures.

04 Field endpoint
Measure disease incidence, crop condition and yield separately.



REPORTED DISTRIBUTION TIME The source reports systemic distribution after 8 hours for foliar treatment and 24 hours for root treatment.

08 APPLICATION GUIDANCE

Application schedules by source

The technical documents contain separate dilution schedules for different product strengths and crop programs.

Route	Green-algae presentation	0.8% total-N example	Crop-method guide
Seed soak	1:100; 5-8 h for vegetables and flowers; 24+ h for rice, cotton and beet	1:500; same time framework	Typically 1:1,000; crop-specific
Foliar	1:600-700 early; 1:300-500 at flowering; every 7-10 days	1:1,000-1,500 seedling to 1:500-800 vigorous stage	1:1,000-3,000 depending on crop and timing
Root drench	1:300-500; wet the effective root area	1:500-1,000 every 7-10 days	1:1,000-2,000 for several crop groups

SOURCE CONTROL The table preserves each schedule with the concentrate and crop program stated in its source.

09 OPERATING CONTROLS

Handling, compatibility and quality checks

The product guidance combines handling instructions with analytical data for one Chlorella polysaccharide sample.

HANDLING + COMPATIBILITY

01	**Dissolve fully**	Mix only after complete dilution in water.
02	**Use promptly**	Diluted solution can support rapid microbial growth and develop odor if held.
03	**Protect during storage**	Store indoors or in a cool shaded place, away from direct sun.
04	**Verify tank mixes**	The source permits use with fertilizers, soil conditioners and pesticides; perform a jar test and follow current labels.

2017 LABORATORY SUMMARY

8.18%
water-soluble polysaccharide

18
hydrolyzed amino acids reported

SELECTED MINERALS

Potassium (K)	Phosphorus (P)
137,739 ppm	26,330 ppm

SCREENED METALS Cd, Hg, Pb: ND at 0.5 ppm. As 0.9; Cr 3.3; Cu 5.2; Ni 6.0; Zn 17.7 ppm.

Source: Chlorella polysaccharide laboratory reports, August 2017.

10 CONCLUSION

Technical conclusion

The Culture Solution is a non-microbial, algae- and yeast-derived nutrient medium with connected soil and plant-response routes.

FORMULATION	>	SOIL ROUTE	>	SOIL / ROOT ENDPOINTS
Amino acids + nucleotide products + soluble carbohydrates		Resident microbial activity, nutrient cycling and aggregation		Biological activity, nutrient access, root and crop response
FORMULATION	**>**	**PLANT ROUTE**	**>**	**PLANT ENDPOINTS**
Oligo- and polysaccharide signals		Defense proteins, chitinase and beta-1,3-glucanase		Disease pressure, crop condition, quality and yield

TECHNICAL SUMMARY The formulation links resident microbial nutrition with plant-defense response. Soil, root, disease and crop measurements follow these routes.

END OF TECHNICAL OVERVIEW

Thank you for your time.

For the current specification, crop protocol or a controlled pilot discussion, contact the Periodical Systems technical team.

TECHNICAL FOLLOW-UP

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