
The logo for BioConsortia features the word "Bio" in a large, bold, black sans-serif font. The letter "o" is replaced by a stylized globe with blue and green segments and a green leaf-like shape extending from the top. The word "Consortia" follows in the same large, bold, black sans-serif font.

BioConsortia

**Advanced Microbial Selection:
Identification of trait transforming microbial consortia.**

R&D Company

Innovators of microbial solutions for natural plant trait enhancement and crop yield improvement

Plant-microbe interactions are complex

Interactions contributing to biocontrol

Pathogen control

- Parasitism, antibiotic production
- Competition
- Habitat modification

Improved plant nutrition

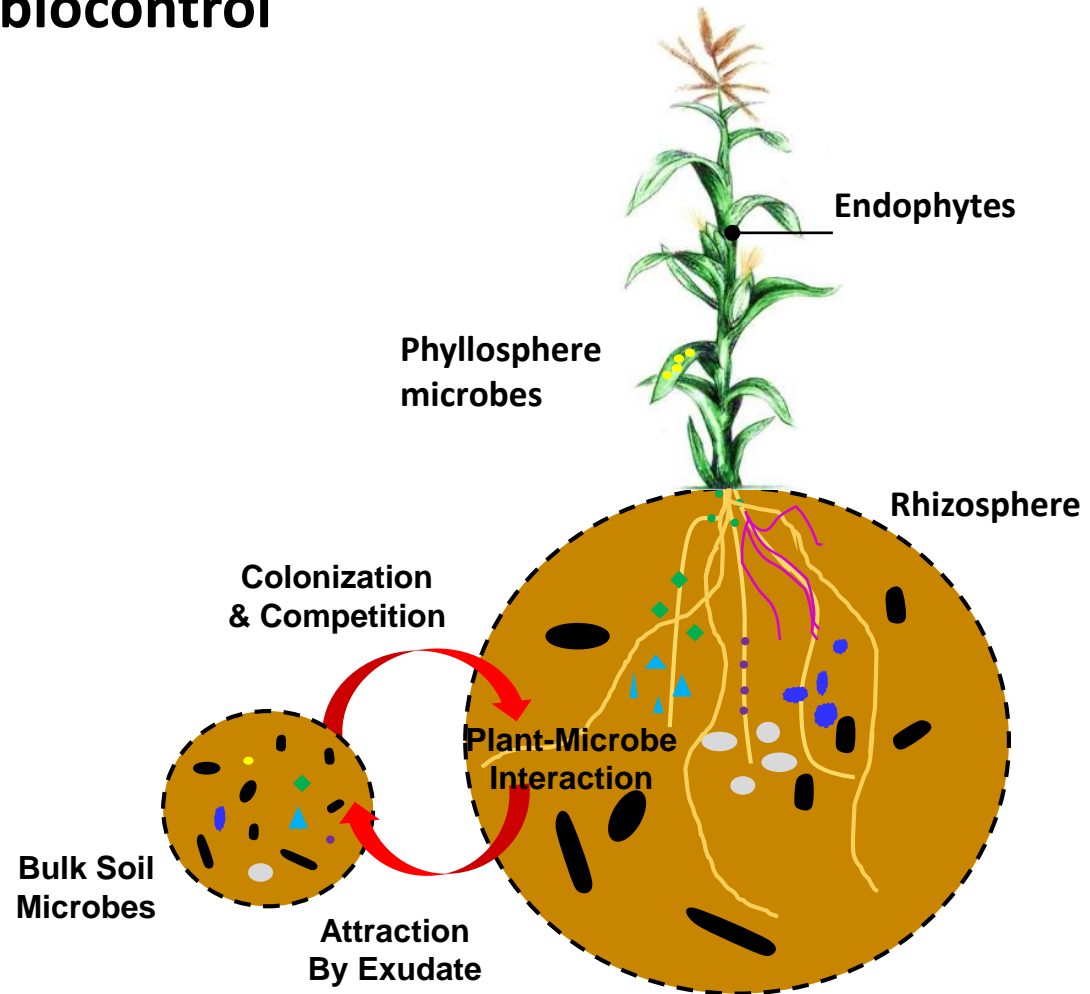
- Access to macro and micronutrients

Early vigor and growth stimulation

- Plant growth hormones
- Germination rate

Modified plant structure & functions

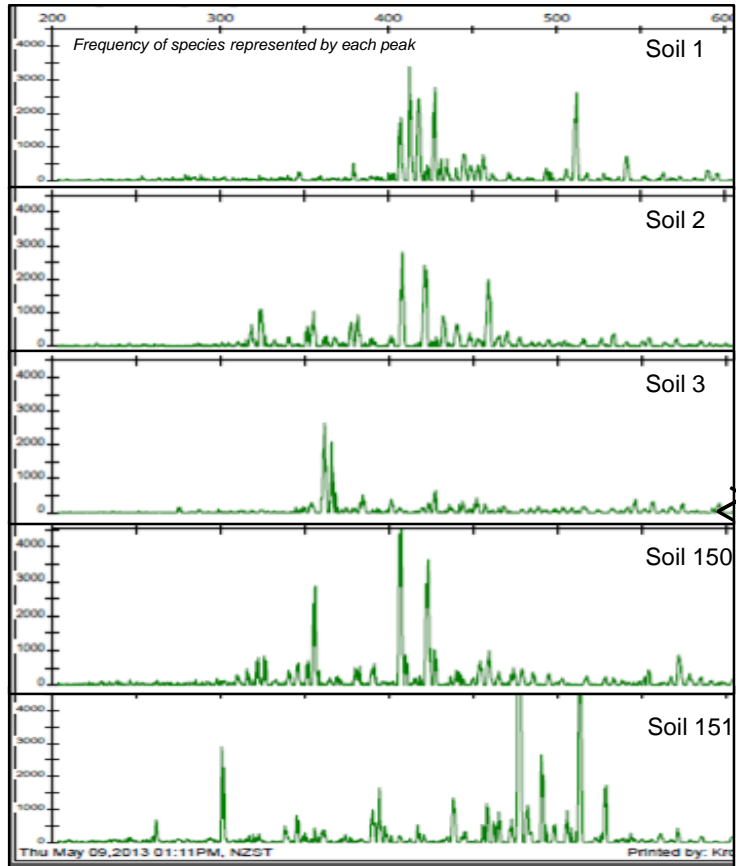
- Root structure and growth rate
- Plant metabolite production
- Abiotic stress protection
- Acquired and induced stress responses



Too complex for conventional R&D

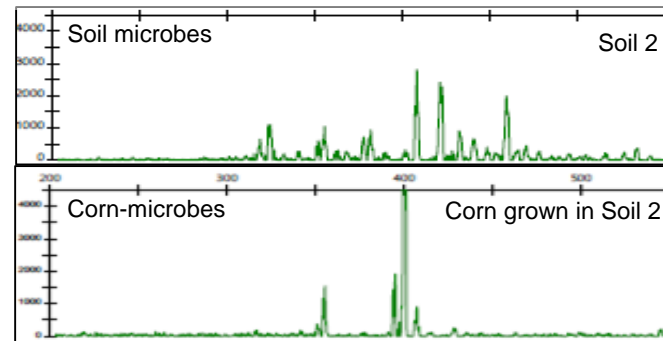
Plant Selects the Microbes

Each soil has a different microbial community



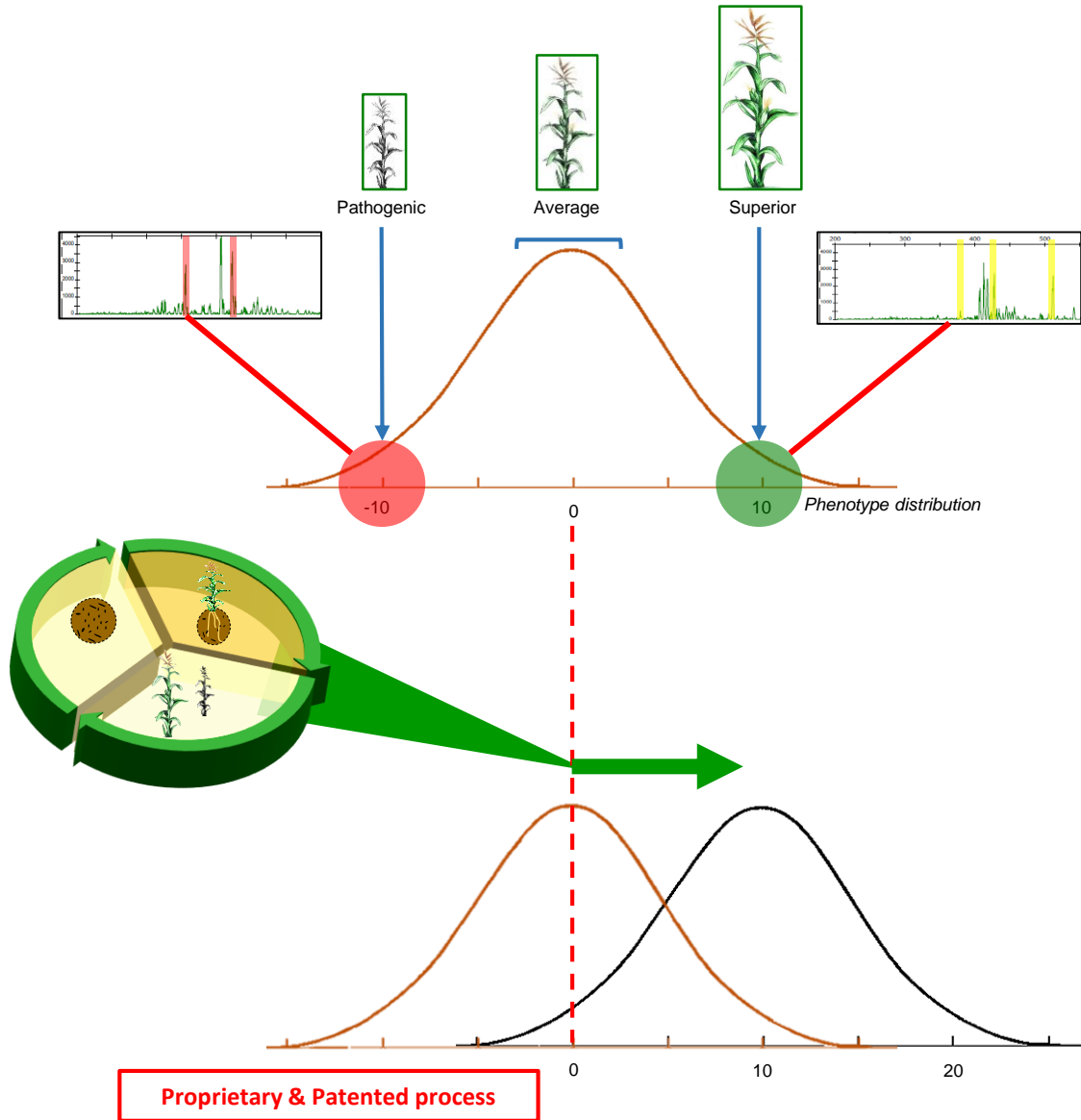
Community Fingerprinting: Automated Ribosomal Intergenic Spacer Analysis (ARISA)

Plants accumulate a different microbial community structure than present in the soil



We exploit this natural process identifying the microbial consortia that improve plant traits

Directed Selection



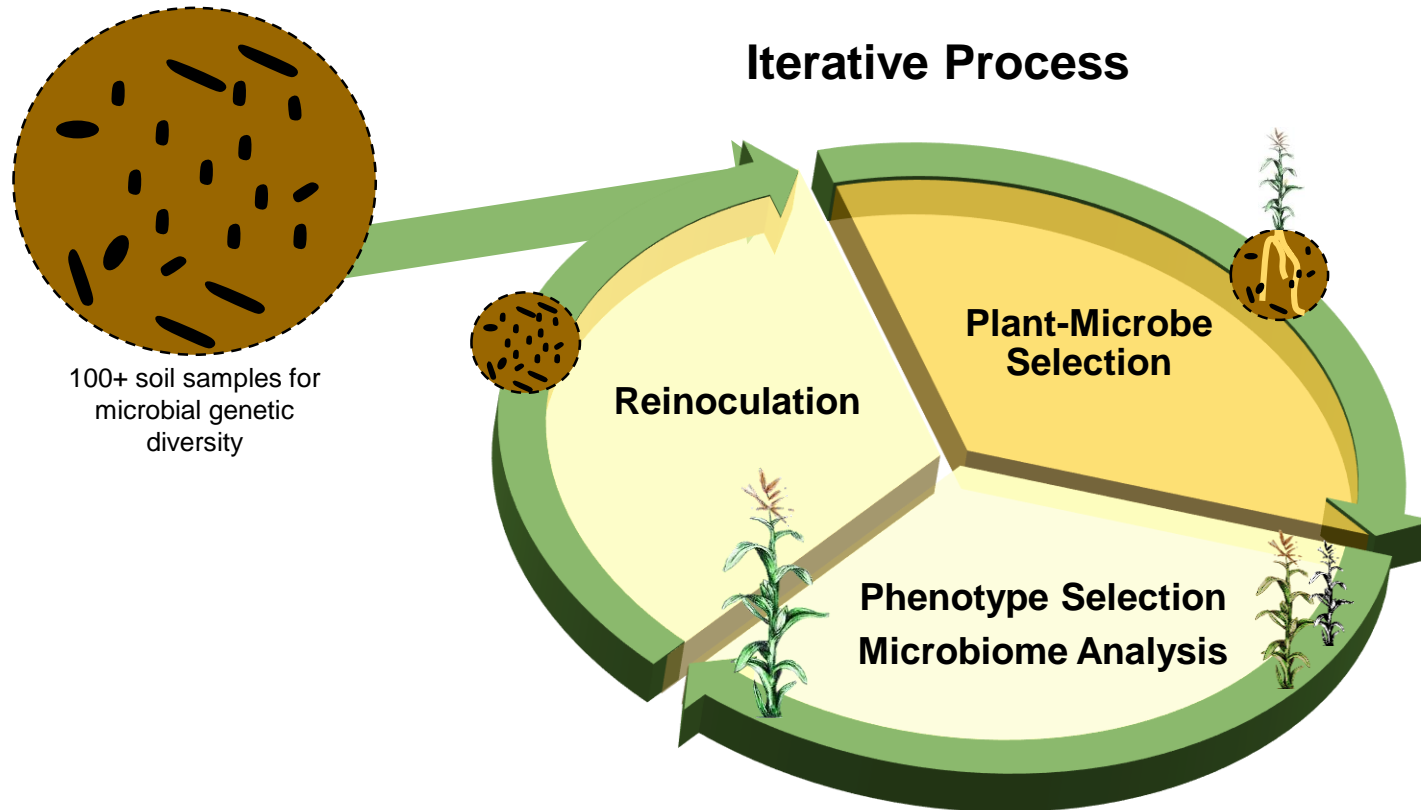
The AMS Process

Selecting the superior phenotype
Selection in both ideal & stressed environments.

Changing the microbial community
Advancement of the most beneficial microbes through iterative selection rounds.

Driving an improvement in trait performance
Accumulation of microbes responsible for enhanced targeted traits.

Evolving the Microbiome



Genetics x Environment x Microbiome = Phenotype

The Advanced Microbial Selection (AMS) iterative process drives beneficial changes in the microbiome to improve expression of crop phenotypes linked to targeted crop traits.

Proprietary & Patented process

Stress Application Influences Selection

Exposing plants to different stressed environments during the AMS selection rounds results in differential evolution of the microbiome:

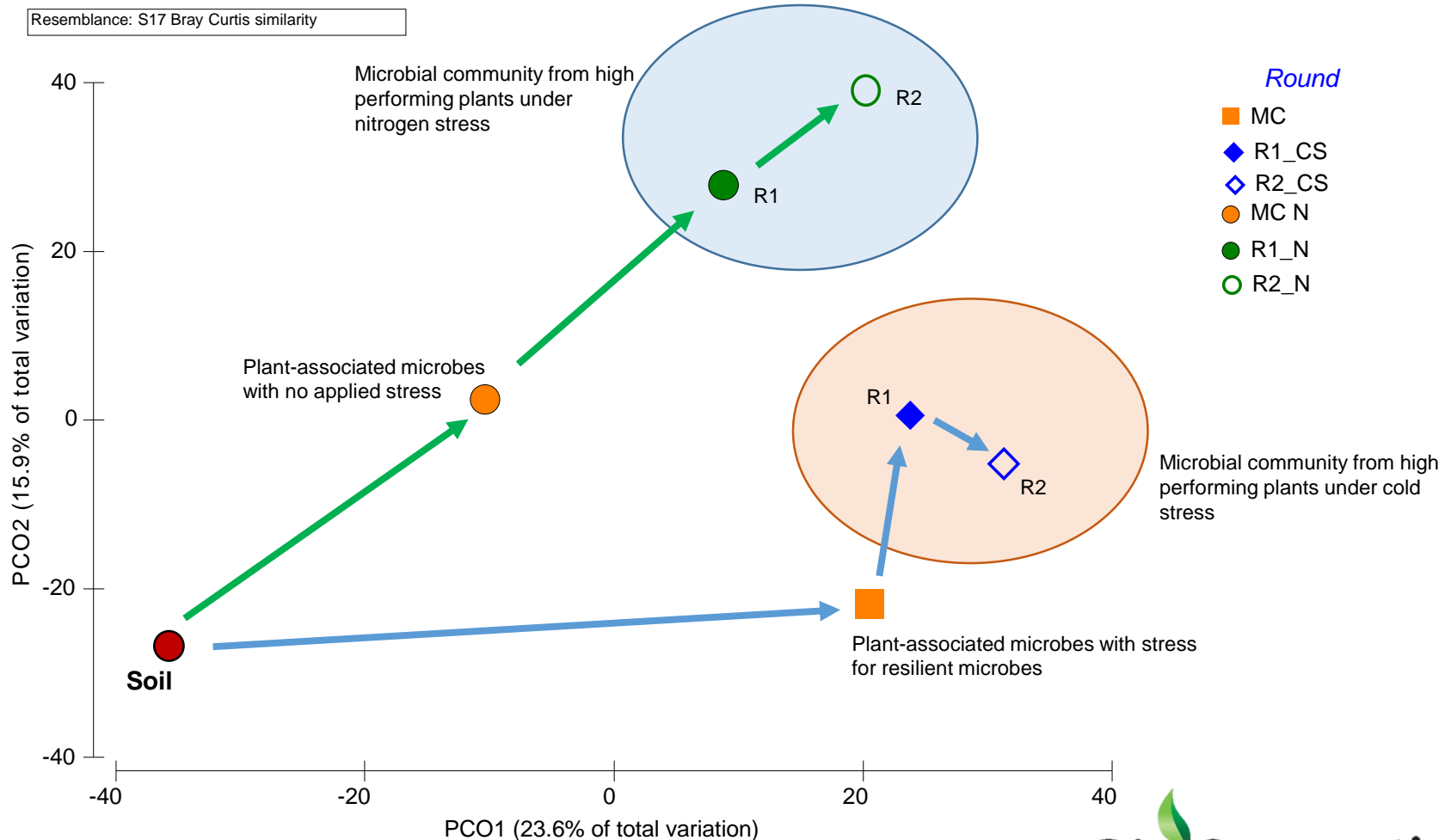


- **Pest pressure**
- **Disease exposure**
- Nitrogen stress
- Drought stress
- Cold & wet start

Superior plants have accumulated microbes that assist with enhanced health and resistance to the stress pressure

Directed Evolution of Microbial Consortia at Each Step

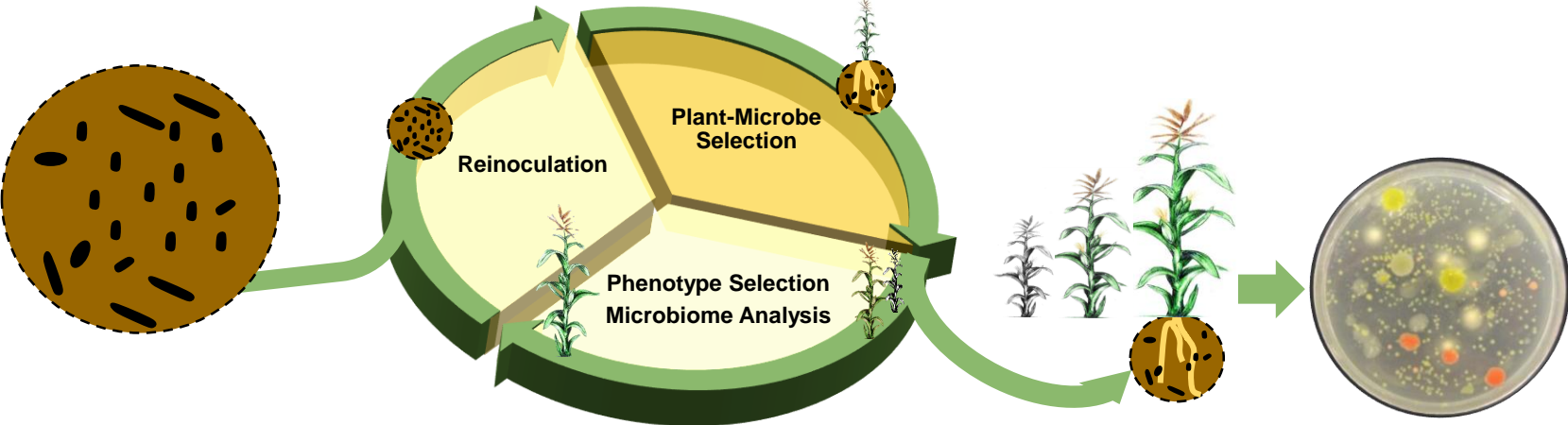
Two examples of the iterative process for illustrative purposes



*soil marked as a place holder on the graph – true data point off the scale of this graph

Advanced Microbial Selection (AMS)

We select the crop trait - the plant selects the microbes



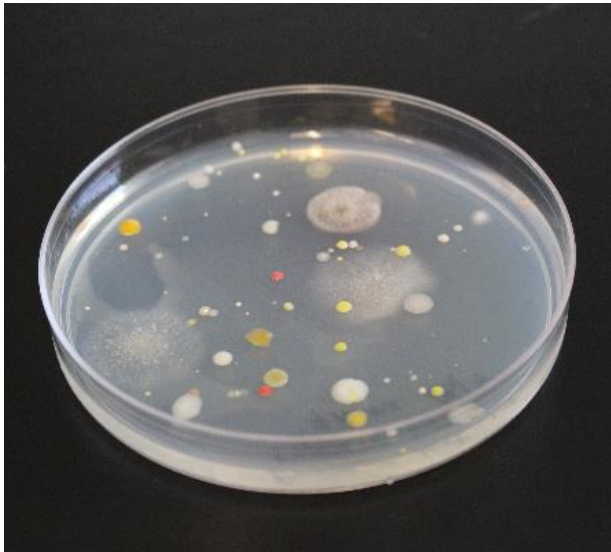
Proprietary & Patented process

Various tools used for selection at each step

Consortia Assembly & Screening

Multiple proprietary tools used to select consortia

Multiple isolation strategies
Large isolate library



Microbiome informed
selection



Other factors:

- superior phenotypes
- functional groups (eg N-fixation)
- spore formers
- microbial phenotype

Screening of consortia
(multiple soils & hybrids)



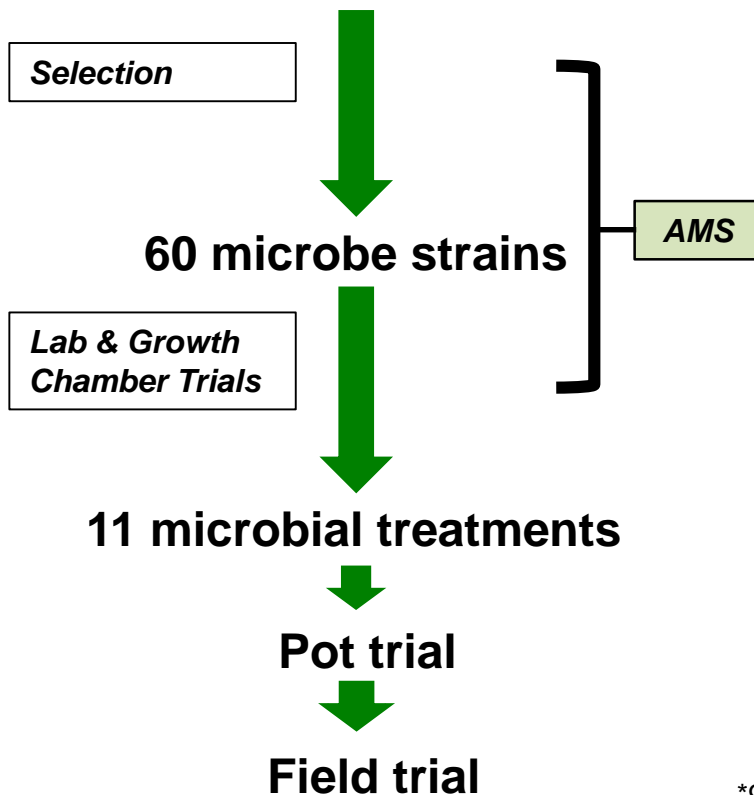
Best plants = Best treatments

Individual isolates are fermented separately then combined to make consortia

Proprietary & Patented process

Effective Funnel – Screen 100,000 Strains

150 different soil samples
> 10^{13} microbes
> 10^5 different strains



In 9 months*, 150 microbial communities were screened under nitrogen stress, resulting in 4 microbial treatments for field trials that produced a significant increase in corn biomass

*9 months for this experiment, time may vary depending on selection method

Soil-Borne Pests

Projects Underway:

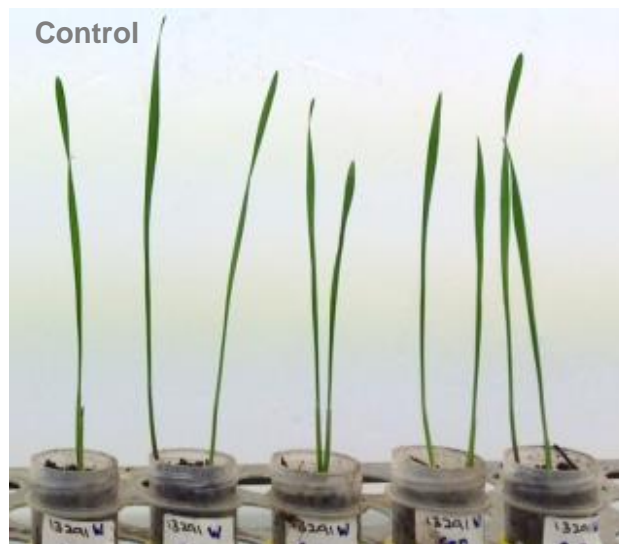
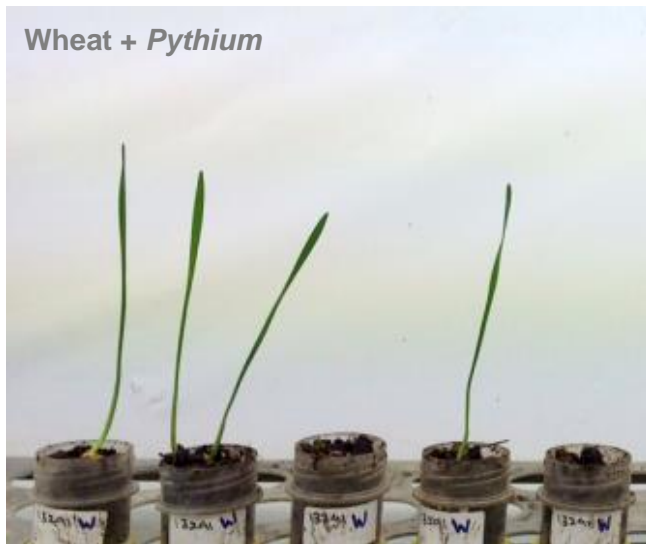
- Corn rootworm
- Soybean cyst nematode



Soil & Seed-Borne Fungal Disease

Fungal disease targets

- **Crops:** tomato, wheat, lettuce
- **Targets:** *Rhizoctonia*, *Fusarium*, *Pythium*



Unique Advantages of AMS Process

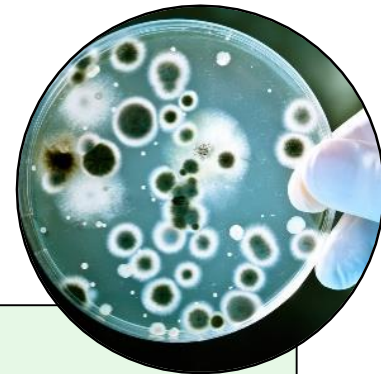


Pre-selected for compatibility

- **Plant - Microbe:** selected by the plant from soil
- **Microbe - Microbe:** colonize & isolated from plant as team
- **Microbe - Chemistry:** seeds pre-treated with best seed treatments

True Team

- Selected as a team
- Complementary functions
- Effective plant colonizers: endophytes, epiphytes, rhizospheric microbes



Rapid, Low Cost

- Compared to GM & conventional plant breeding, and conventional microbial R&D model
- Expedited development taking ~9 months vs years
- Allows for research into minor crops and almost any trait

Intellectual Property

SeedWORLD

Technology

Business

Sustainability

Leadership

News

Magazine

[HOME](#) » [NEWS](#) » [BUSINESS](#) » BIOCONSORTIA OBTAINS U.S. PATENT FOR DISCOVERY OF MICROBIAL PRODUCTS

BioConsortia Obtains U.S. Patent for Discovery of Microbial Products



Thank you

