Phytobiomes: A New Vision for Agriculture

Name
Date
Conference & City Country
Plant-Based Agriculture: A Complex System

A “Phytobiome”

Micro- and Macro-organisms
- Viruses
- Archaea
- Bacteria
- Amoeba
- Oomycetes
- Algae
- Fungi
- Nematode

Plants

Soils

Arthropods, Other Animals and Plants
- Insects
- Arachnids
- Myriapods
- Worms
- Birds
- Rodents
- Ruminants
- Weeds

“Biome” – Site specific environment

Climate and Weather
Holy Grail for Phytobiomics

To understand, predict, and control emergent phenotypes within specific phytobiomes for the sustainable production of food, feed, and fiber

How do we get there?
INTERNATIONAL ALLIANCE FOR PHYTOBIOMES RESEARCH

A nonprofit consortium of industry, academic, and governmental scientists
Our **mission** is to establish a science and technology foundation for site-specific, phytobiome-based enhancement of sustainable food, feed, and fiber production.
By 2050, all farmers have the ability to use predictive and prescriptive analytics based on geophysical and biological conditions for determining the best combination of crops, management practices, and inputs for a specific field in a given year.
Why Now?

● Omics-enabling technologies and data

● Systems-level methods - convergence

● Advances in computational science
  - Machine learning, deep learning
  - Analytics
  - Predictive analytics
  - Quantum computing

● Precision Agriculture
  - Variable rate technology...seeding & input
  - Unmanned Aerial Systems (UAS)
  - Soil, plant, & weather sensors
  - Robots
Strategies

• Focus on pre-competitive science
• Determine research, resource, and technology gaps and develop roadmaps to fill them
• Coordinate and manage projects to address gaps
• Facilitate international and public-private collaborations
• Develop an interdisciplinary community of researchers committed to advancing phytobiomes science
• Empower industry growth and profitability
Fundamental Research Areas

• Universal, common, and environment-specific trends in microbiome composition
• Mechanisms by which distinct phytobiome components interact
• Genetic linkages that connect phytobiome components
• Impacts of phytobiome components on plant health
• Multidirectional feedbacks that influence phytobiome components
Phytobiomes Alliance Organizational Structure

- **Board of Directors**
  - Establishes overall vision

- **Coordinating Committee**
  - Financial sponsors
  - Project leaders
  - Establishes priorities, strategic plans, and roadmaps

- **Topical Working Groups**
  - Implements strategic plans

- **Executive Office**
  - Oversees and runs daily operations

- **Members**

- **Scientific Coordinating Committee**

- **Data Working Group**

- **Standards Working Group**

- **Regulatory Working Group**

- **Climate/Weather Working Group**

- **New Working Group**

- **Executive Director**
  - Chief Operating Officer
  - Communications Director
Join Us!

SCIENTIFIC COORDINATING COMMITTEE

- ALLIANCE SPONSORS
- PROJECT LEADERS

ALLIANCE WORKING GROUPS

- OVERALL TOPICAL LEADER
- INVOLVED IN PROJECTS AIMED AT FILLING GAPS IN KNOWLEDGE, RESOURCES, OR TOOLS

SUBSCRIBE TO MAILING LIST

- WWW.PHYTOBIOMESALLIANCE.ORG
Thank you for your attention!

www.phytobiomesalliance.org