Phytobiomes and the International Alliance for Phytobiomes Research

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From Simple to Complex

Traditional Sciences

- Reductionism
- World is linear – understanding parts individually
  - Soils
  - Plant genetics
  - Microbiomes or
  - Weather and environment

Real World Situation

- Complex system, non-linear organization
- Governed by multiple nonlinear interactions and multiple environmental variables

We need a global approach to elucidate, quantify, model, and potentially reverse engineer biological processes & mechanisms for their geophysical context

Decipher Phytobiomes

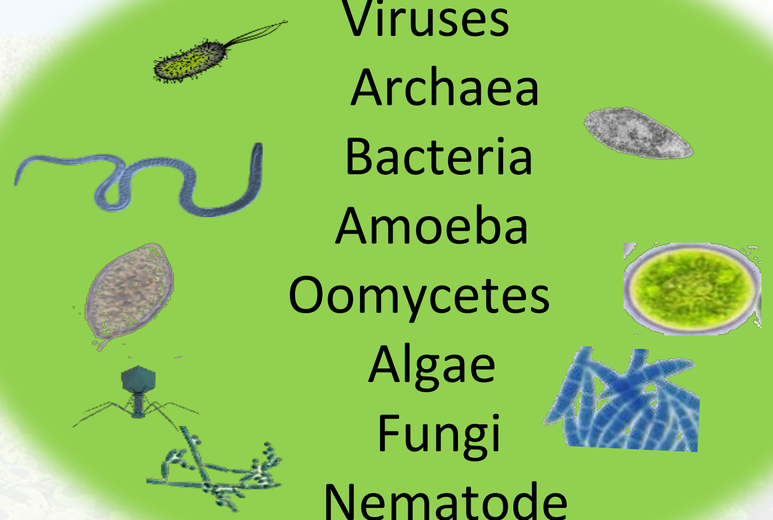
Phytobiomes: A Complex System

Crop plants, their environment, and their associated micro- and macro-organisms.

Climate

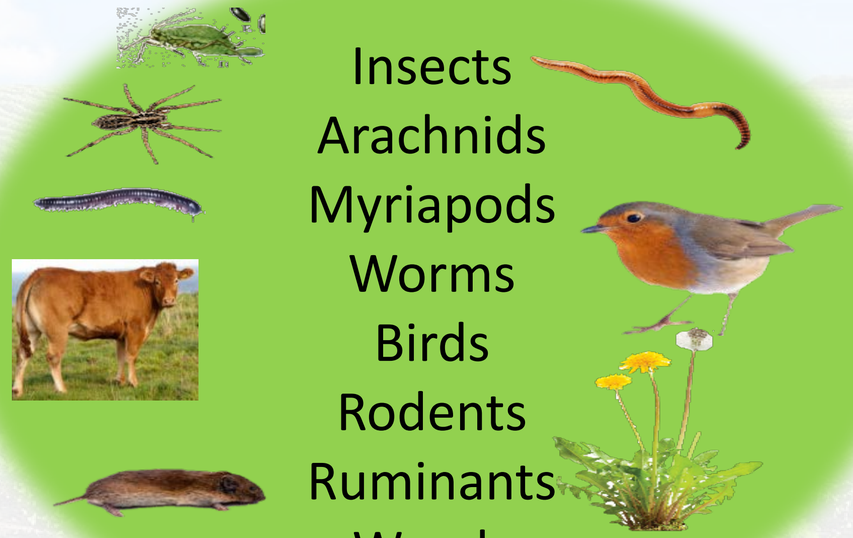
Plants

Micro- and Macroorganisms



Viruses
Archaea
Bacteria
Amoeba
Oomycetes
Algae
Fungi
Nematode

Arthropods, Other Animals and Plants



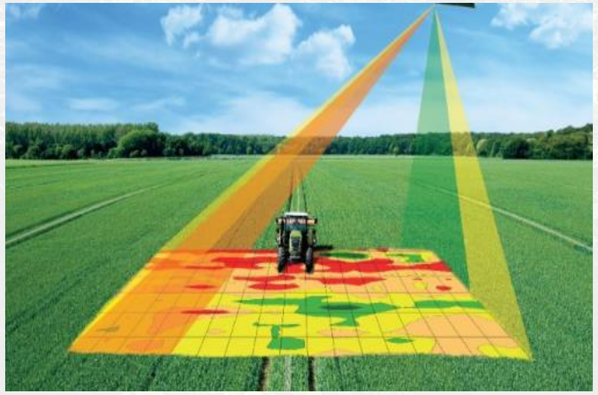
Insects
Arachnids
Myriapods
Worms
Birds
Rodents
Ruminants
Weeds

“Biome” - Site specific environment

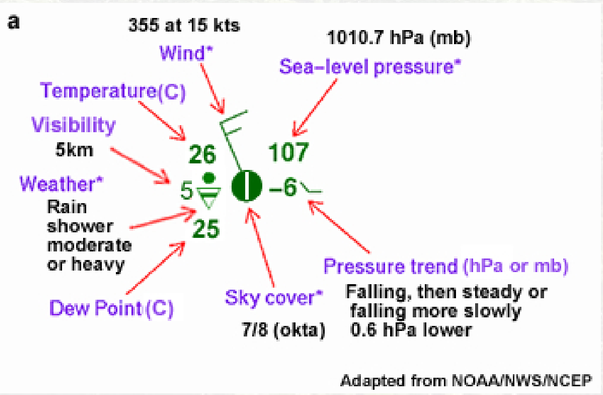
Associated organisms

Why Now?

- Omics-enabling technologies
  - high-throughput sequencing
  - computational biology & modeling
- Systems-level methods
- Advances in computational science
  - Quantum computing
  - Machine learning
  - Analytics
  - Predictive analytics
- Precision Agriculture
  - Variable rate seeding & input
  - UASs
  - Soil & weather sensors



www.linkedin.com/pulse/foreign-affairs-precision-agriculture-revolution-ulrich-adam



PHYTOBIOMES ALLIANCE

The International Alliance for Phytobiomes Research

Who We Are

An international, nonprofit alliance of industry, academic, and governmental partners

PHYTOBIOMES ALLIANCE

BAYER
Science For A Better Life

MONSANTO

THE CLIMATE CORPORATION

Eversole Associates
Enabling Science & Technology

indigo

INRA
SCIENCE & IMPACT

IRD
Institut de Recherche pour le Développement
FRANCE

PennState
College of Agricultural Sciences

THE SAMUEL ROBERTS NOBLE FOUNDATION

NewLeaf SYMBIOTICS

APS
Healthy Plants • Healthy World

BioConsortia

Vision

All farmers have the ability to use predictive and prescriptive analytics to choose the best combination of crop/variety, management practices, and inputs for a specific field in a given year taking into consideration all physical (climate, soil…) and biological conditions (microbes, pests, disease, weeds, animals….).

PHYTOBIOMES ALLIANCE

Alliance Mission

Establish a science and technology foundation for site-specific, phytobiome-based enhancement of sustainable food, feed, and fiber production.

Strategy and Implementation

- Focus on pre-competitive science to empower growth and profitability
- Identify research, resource, and technology gaps (e.g., model development)
- Facilitate linkages within and between industry and academia
- Identify scientific leaders for priority areas
- Work to secure project funding for academic units and the Alliance
- Coordinate and manage projects to address gaps
- Link with existing initiatives and efforts

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Fundamental Research Priorities

- Determine the universal, common, and environment-specific trends in phytobiome composition and the key drivers of microbiome composition and development
- Ascertain the mechanisms by which distinct phytobiome components interact
- Determine the genetic linkages that connect phytobiome components
- Identify how multitrophic interactions modulate host phenotypes
- Detect the full range of impacts of phytobiome components on plant health
- Determine the multidirectional feedbacks that influence phytobiome components

PHYTOBIOMES ALLIANCE

Alliance Structure

- Board of directors establishes overall vision
- Scientific Coordinating Committee sets priorities and strategic plans – membership limited to Alliance sponsors and Alliance project leaders
- Topical working groups implement strategic plans – membership comprised of representatives of Alliance sponsors and team members of project leaders
- Staff and contractors advance the vision & mission, raise funding for administration and projects, establish networks, manage and/or coordinate projects, and ensure progress towards Alliance goals

PHYTOBIOMES ALLIANCE

Operational Budget

- Revenue: Sponsor fees ~ $90,000 plus in kind from Eversole Associates with goal of capturing 10% overhead on research projects managed by Alliance staff
- Staff – Chief Operating Officer (L. Leach) & Communications Director (I. Caugant)
- Professional fees for attorney and account
- General operating expenses and meetings/travel

Annual Sponsor Fees

- $30,000 per year for companies with revenue of $5 billion or above
- $20,000 per year for companies with revenue between $1 billion and $5 billion
- $15,000 per year for companies with revenue between $500,000 and $1 billion
- $10,000 per year for companies with revenue between $250,000 and $500,000
- $5,000 per year for companies with revenue of $250,000 or less
- Start-ups without revenue or limited financing negotiable

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Sponsor Benefits

- One seat on the Scientific Coordinating Committee
- A representative on all working groups or task forces
- Access to pre-competitive, pre-publication data for company employees, negotiated add-ons for subsidiaries or contract research organizations
- Leadership role in establishing Alliance priorities, strategic plans, and activities

PHYTOBIOMES ALLIANCE

Join us

Scientific Coordinating Committee

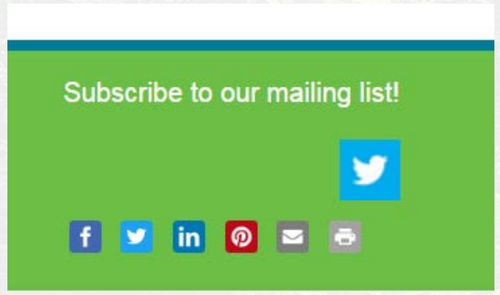
- ✓ Alliance sponsors
- ✓ Project leaders

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



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For More Information:

www.phytobiomesalliance.org

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