

# **AN UNEXPLORED BENEFIT OF REGENERATIVE AGRICULTURE**

## Investigating Mycelial Dominance in Farming & Gardening.

Regenerative Agriculture (R.A.) offers a promising model for soil management. The defining rule for R.A., “no-till, no-dig, no-pull”, offers an alternative soil management strategy. Maintaining soil integrity and a “detritosphere” (a layer of organic litter or mulch) on the soil surface facilitates the establishment of extensive and sustainable mycelial networks. This reminds us of fungal networks in forest soils that typically match the longevity of the forests themselves. Those networks have been identified with critical roles in the sylvan environment – improved H<sub>2</sub>O retention, enhanced disease resilience, and sharing of nutritional sources among species.

UCSD Center for Integrative Research will seek to identify improved practices for establishing and maintaining the integrity of mycelial networks through genomic sequencing and analysis. By comparing 100% SOM (soil organic matter) to organic-certified and conventional soil, we seek to measure and validate the fungi/bacterial ratio, the dominant fungi, quantity of unknown microorganisms, the interaction amongst organisms such as rhizophagy and fungal suppression of pathogens, among other phenomena, as yet unperceived.

The testing of various soil mixtures including standard organic cultured soil, conventional agriculture soil, and a transformative mix of 100 %compost/vermicompost\*, and others to be determined.

- Microbiome sequencing
- Literature review
- Quantitative and qualitative analysis of sequencing.

Endpoints include the qualitative and quantified assessment of mycelia populations under ideal circumstances. The final analysis will augment known best practices with clear and solid scientific validation. We will identify numerous other organisms that may be relevant to the overall discipline of regenerative practice.

\*We will only be using vermicompost (the most diverse compost available) added to thermophilic compost for best practices due to the cost associated with vermicompost which makes it impractical for solo use. Thermophilic compost provides numerous advantages. The production of thermophilic compost immediately sequesters carbon and gives us the widest array of organisms available after vermicompost.

**Rafaela Crevoshay**, C.C.A., C.P.H. is a seasoned, progressive, dedicated, passionate, resourceful, imaginative, and visionary agriculture professional, with a lifelong commitment to sustainable, organic, regenerative, and transformative soil. Her leadership experience includes the Deep Roots Project as Soil Guru, the executive director of AgSustain, President of Vermivision, Vice President of Sustainability, Scientific Certification Systems, General Manager and Owner, The Phylum, Director of Marketing, Calavo Growers of California and Product Manager, Dole Foods, Mushroom Division Sequel .

Rafa is certified as a Certified Crop Advisor: American Society of Agronomy, a Certified Professional Horticulturist: American Society of Horticultural Science, and a Certificate of Technical Ability in Composting. She also has certifications for Turf Management, Food and Agricultural Management, Emphasis in International Agriculture and a B.S., Horticulture from University of Wisconsin, Madison.

**Paul Stamets** is a writer, speaker, medical researcher, and innovator. Paul is considered the industry leader in fungi production, habitat, and medicinal uses. He lectures extensively to deepen the understanding and respect of the fungal organisms.

As the founder and Chief Science Officer and Fungi Perfecti, he has discovered and named numerous new species for mushrooms and spearheaded numerous research initiatives for the use of fungi. Paul has dedicated his life to discovering, understanding, and spreading knowledge about the unique, mysterious, and fantastic world of fungi.

**Dr. Jack Gilbert** (The Jack A Gilbert Lab UCSD) earned his Ph.D. from Unilever and Nottingham University, UK in 2002, and received his postdoctoral training at Queens University, Canada. In 2019 he moved to University of California San Diego, where he is a vice chancellor of the Scripps Institution of Oceanography. He cofounded the Earth Microbiome Project and American Gut Project. He has authored more than 300 peer reviewed publications and book chapters on microbial ecology. He is the founding Editor in Chief of mSystems journal. In 2014 he was recognized on Crain's Business Chicago's 40 Under 40 List, and in 2015 he was listed as one of the 50 most influential scientists by Business Insider, and in the Brilliant Ten by Popular Scientist. In 2016 he won the Altemeier Prize from the Surgical Infection Society, and the WH Pierce Prize from the Society for Applied Microbiology for research excellence. In 2019 he was elected to the Philosophical Society of Washington. He also co-authored "Dirt is Good" published in 2017, a popular science guide to the microbiome and children's health.

**Dr. Gordon Saxe** is a preventive and integrative medicine physician who provides chronic disease management and helps people prevent and treat disease through integrative and lifestyle medicine. He uses evidence-based therapeutic approaches such as diet and nutrition, exercise, body-mind stress reduction and sleep management to decrease disease risk and illness.

Dr. Saxe is director of the UC San Diego Center for Integrative Nutrition and chair of the Krupp Endowment for research on the benefits of natural complementary and alternative medicine. He has conducted research on the epidemiology of diet and cancers of prostate, breast, and pancreas, diet and body-mind exercise to control the spread of advanced prostate cancer, and diet and gene expression in prostate cancer. His research has been published in peer-reviewed journals including *Integrative Cancer Therapies*, *The Journal of Urology*, *The Journal of Alternative and Complementary Medicine*, and *The Journal of the American College of Nutrition*.