



Healthy Plants • Healthy World

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Dr. Mervalin Morant
National Program Leader - Soil Ecology
USDA-CSREES - Natural Resources and Environment
1400 Independence Avenue S.W.
STOP 2210
Washington, D.C. 20250-2210

Dear Dr. Morant:

Thank you for the opportunity to provide input on prioritization of issues within the CSREES/USDA Soil Ecology Program. The American Phytopathological Society is a leading professional organization promoting the study of plant health management. We have nearly 5000 members worldwide, and a significant proportion of our membership is directly concerned with root health and diseases of plants caused by soilborne organisms.

Our priorities for the Soil Ecology Program were established by polling members of the APS Root Diseases and Soil Microbiology Committee, the APS Biological Control Committee, and members of two regional committees on soil microbiology and biological control of root diseases (W-1147 and NC-125). Our response is organized according to the format you provided.

1. What do you consider to be the priority issues or issue areas in soils and soil ecology?

A. Research

1. Understanding the ecology of plant-associated soil microorganisms, including plant pathogens
2. Characterizing quantitatively the biotic and abiotic factors that control the population dynamics of soilborne plant pathogens, and that influence development of plant disease.
3. Determining the effects of agricultural practices (e.g compost applications, no-tillage practices, incorporation of green manures) on soil microbes and soilborne plant pathogens.
4. Elucidating the linkage between soil carbon sources, soil microbial community structure, and activities of soilborne plant pathogens
5. Determining the biotic and abiotic basis of disease suppressive soils
6. Understanding why biological control efforts are frequently inconsistent and ineffective
7. Predicting the behavior of and risk associated with new invasive species of soilborne plant pathogens

B. Education

1. Enhancing graduate educational opportunities to help students better understand the dynamic, heterogeneous and interacting nature of soil

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organisms, and the role of soilborne plant pathogens in mediating plant growth and affecting plant communities

2. Providing incentives for graduate education through training grants or competitive fellowships

C. Extension

1. Educating growers to understand soil ecological effects of agricultural practices
2. Extending basic research findings on the ecology of soilborne plant pathogens and management of soil microbial communities to achieve more effective control of soilborne plant diseases in the field

2. Are there issues that should be addressed at a regional level vs. the national level in each of the above categories?

A. Research

Most research issues listed above can be addressed at the national level. However the activities of certain soilborne pathogens and their antagonists can be expected to differ on much smaller spatial scales, often as a result of regional differences in production systems. In these cases it would be advantageous to address soil ecological issues at the regional level. Soil ecological effects of dryland cereal production in the Pacific Northwest is an example of a problem best addressed at a regional, rather than a national, level.

B. Extension

Effective linkages between basic and applied research may be more effectively addressed at the regional level than the national level.

3. What potential impact(s) do you foresee from investing in these issue areas? (Research, Education and Extension combined)

- A. Developing more effective strategies for controlling soilborne diseases based on an understanding of pathogen ecology and management of soil microbial communities
- B. Reducing reliance on pesticides and increasing food quality.
- C. Providing alternatives to soil fumigation for high-value crops.
- D. Reducing inputs and production costs while minimizing crop losses due to soilborne pathogens, thereby increasing the economic sustainability of farms.
- E. Reducing soil erosion and loss due to tillage. No-till practices are desirable in reducing soil erosion, but this can increase disease caused by certain soilborne plant pathogens. An understanding of soilborne pathogen ecology may suggest alternative disease control strategies so that no-till practices can be continued.
- F. Preventing environmental damage by new invasive species of soilborne plant pathogens

Thank you again for the opportunity to suggest areas we feel are important within the Soil Ecology Program.

Sincerely,



Gary C. Bergstrom, President
The American Phytopathological Society