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Education:

B.S. University of Georgia, Horticulture & Plant Pathology, 1976

M.S. Virginia Tech, Plant Pathology, 1981

Ph.D. University of Illinois, Plant Pathology, 1985

Research Interests (with focus on Tropical Agriculture)

Dr. Datnoff's research responsibility is for understanding the epidemiology, etiology and control of fungal plant pathogens that cause soil-borne and foliar diseases of ornamentals, rice, turf and vegetables that occur in Florida and many tropical countries worldwide. He has been investigating a novel nutritional approach to managing these plant diseases which involves the study of the role of silicon for suppressing plant diseases. His interests have included understanding the interactions of silicon with fungicides, residual effects of silicon on disease development, the influence of silicon in the enhancement of host plant resistance and the mechanism (s) of silicon-mediated resistance. The plant pathogens he is studying (or have studied) in this system include *Magnaporthe grisea* (rice and turf), *Thanatephorus cucumeris* (rice and turf), *Cochliobolus miyabeanus* (rice and turf). More recently, he started investigating its effectiveness against diseases of ornamentals (powdery mildew/roses and gerbera daisies), containerized bedding plants (leaf spot/tigergrass), and other vegetable/agronomic crops (downy mildew/cucumbers and Asian rust/soybeans). His research will continue to further define and characterize the role of silicon in plant disease suppression and to determine what genes and gene products might be involved in this process.

In addition, he is investigating the molecular, morphological and pathogenic characterization of the species *Corynespora cassiicola*, the cause of target spot of tomato; factors involved in pathogenesis and molecular characterization of *Fusarium oxysporum* f. sp. *radicis-lycoperisici*, and the pathogenicity, morphological and molecular characterization of isolates of *Rhizoctonia* sp. from turf, and screening germplasm of St. Augustinegrass for resistance.

SELECTED PUBLICATIONS:

Books:

Datnoff, L. E., Elmer, W. H., and Huber, D. 2007. Mineral Nutrition and Plant Disease, American Phytopathological Society, St. Paul, MN, 278 pp. (*BEST SELLER 2007*)

Book chapters:

Snyder, G., Matichenkov, V., and Datnoff, L. 2006. Silicon. Pgs. 551-568. IN: Handbook of Plant Nutrition, A. Barker and D. Pilbeam, Eds., Taylor and Frances, Boca Raton, FL.

Refereed:

Rodrigues, F. A., Jurick, W. M., Datnoff, L. E., Jones, J. B. and Rollins, J. A 2005. Cytological and molecular aspects of silicon-mediated resistance in rice against *Magnaporthe grisea*. *Physiol. and Molecular Plant Pathol.* 66:144-159.

Brecht, M., Datnoff, L., Kucharek, T., and Nagata, R. 2007. Effect of silicon on components of resistance to gray leaf spot in St. Augustinegrass. *J. Plant Nutr.* 30:1005-1021.

Brecht, M., Stiles, C. and Datnoff, L. 2007. Evaluation of pathogenicity of *Bipolaris* and *Curvularia* spp. on dwarf and ultradwarf bermudagrasses in Florida. Online. *Plant Health Progress* doi:10.1094/PHP-2007-01XX-01-RS..

Extramural support during past 5 years: over \$650,000 from USDA (i. e. TSTAR, SARE, ARS), commodity groups, and agricultural industries

Teaching Interests (with focus on Tropical Agriculture)

Dr. Datnoff teaches Fundamentals of Plant Pathology/General Plant Pathology, PLP 3002/5005, and this course includes many examples of plant diseases from tropical countries. The objective of the lecture section of the course is to introduce the student to the many different types of plant pathogens, their basic biology, examples of the types of disease they cause, and the basic principles and concepts of their development, spread and management. The laboratory section emphasizes the principles and concepts of plant pathology through demonstrations and hands-on exercises using living organisms and prepared specimens. Graduate and Doctor of Plant Medicine (DPM) students are required to write a paper and prepare a 20

minute oral power point presentation on plant disease control, i. e. biological, cultural or chemical. He is also supervising the research of four Ph.D's, and three master students as well as the chair of 3 DPM students.

International Activities (with focus on Tropical Agriculture)

In 1992, Dr. Datnoff and his collaborators were the first to show the effects of silicon on upland rice grown on marginal soils in Colombia (CIAT) and Brazil (Universidades Federal de Uberlandia and Vicosa; and EMPRAPA). He documented this effect with plant pathologists and soil scientists in these countries and this collaborative work has added significantly to the understanding that silicon can enhance partial resistance of rice to diseases such as blast and sheath blight to the same general level as complete resistance. Dr. Datnoff further demonstrated that silicon could help reduce the number and rate of fungicide applications and that a one-year residual application of silicon was as effective as full rates of fungicides in controlling rice blast. This finding alone will potentially have a significant effect on the reduction of fungicide applications normally made by rice farmers to control diseases.

During this same period (1996-1997), Dr. Datnoff established a collaborative research project on biological control of soil-borne diseases with the CONSEJO and Universidad de Cordoba, Spain that was supported by the Fulbright program. Along with his Spanish colleagues, he demonstrated that indigenous and commercial biological control agents could be used effectively to suppress Fusarium wilt in chickpea and enhance partial resistance to the disease.

In 1999, Dr. Datnoff recognized that it was time to bring researchers together to discuss the role of silicon for promoting plant health and crop performance. He conceived and organized the first international conference on Silicon in Agriculture. Funds were obtained from USDA-Foreign Agricultural Service (FAS), University of Florida-IFAS, and private companies. More than 90 participants from 21 countries and 12 U.S. states representing scientists, growers and producers of silicon fertilizers attended. Proceedings of this conference entitled "Silicon in Agriculture" were published by Elsevier Science, The Netherlands, in 2001, and represented the first and foremost treatise on the subject.

In 2001, Dr. Datnoff established a cooperative research program with the University of Laval in Canada to investigate the mechanisms of silicon-mediated rice blast resistance. A part of this program involved graduate student exchange. Based on this exchange, the students found that higher levels (2 to 3 times greater) of momilactone phytoalexins were in leaf extracts from plants inoculated with *M. grisea* and amended with silicon (Si^+) than in leaf extracts from inoculated plants not amended with silicon (Si^-) or noninoculated Si^+ and Si^- plants. As a consequence, the more efficient stimulation of the terpenoid pathway in Si^+ plants and the increase

in the levels of momilactones appears to be an important factor contributing to enhanced rice blast resistance.

Dr. Datnoff also serves as a program manager on a memorandum agreement between UF/IFAS's Office of International Programs and the Universidade Federal de Uberlandia, Departamento de Agronomia in Brazil, focusing on using silicon for managing plant disease and improving plant health as a means of training students in plant pathology and other agricultural disciplines. From 1997 to 2004, Dr. Datnoff has helped 10 international students come to the University of Florida's EREC for six months to increase their research skills, participate in research projects, improve communication skills, and to obtain first hand knowledge of U. S. agricultural production practices. These students have completed research projects that lead to journal publications, and have returned to Gainesville to pursue their Ph.D. and M.S. in plant pathology and soil science. In fact, one of his recent Ph. D. students from this country, Dr. Fabricio A. Rodrigues received the University of Florida's prestigious international student award from the College of Agricultural and Life Sciences for his silicon research.

Dr. Datnoff has received several prestigious awards: In 1993, he received a competitive fellowship from the National Committee for International Science and Education and the Research and Scientific Exchange Division of OICD/USDA Pilot Linkage Program for International Agricultural Research with CIAT, Colombia; a Fulbright Research Award to Spain (1996-1997); the University of Florida-IFAS's Interdisciplinary Team Research Award for the Silicon Project (1999, as Team Leader); a plaque of recognition for his contributions to silicon research from the organizing committee for the 3rd Silicon in Agriculture conference (2005); the UF/IFAS Research Foundation Professorship Award (2006), Invited Visiting Professorship at the Institute of Bioresources, Okayama University, Japan (2006), and Invited Visiting Professorship at the Departamento de Agronomia, Universidade Federal de Uberlandia, Brasil (2008). He also has been invited to present his research findings at major universities, institutions and international meetings in Brazil, China, Canada, Colombia, France, Honduras, India, Japan, Norway, Philippines, United Kingdom, Venezuela, and many parts of the U.S. Dr. Datnoff has received more than \$1.8 million in grant support from agencies such as USAID, USDA, and international foundations.

Dr. Datnoff has served on several American Phytopathological Society programs and committees including the Office of International Programs. He also has served as a Fulbright Senior Scholar Program Reviewer for the Council for International Exchange of Scholars.