Parwinder S. Grewal

Professional Preparation:

Punjab Agricultural University, Ludhiana, India	B.S.	1981	Agriculture
Punjab Agricultural University, Ludhiana, India	M.S.	1983	Nematology
Imperial College, University of London, London	Ph.D.	1990	Zoology

Appointments:

2002- present: Associate Professor, Ohio State University, Wooster, Ohio, USA
1997- 2001: Assistant Professor, Ohio State University, Wooster, Ohio, USA
1993-1997: Senior Scientist and Research Group Leader, Biosys, Columbia, Maryland, USA
1991-1993: Post-doctoral Associate, Rutgers University, New Brunswick, New Jersey, USA
1989-1991: Higher Scientific Officer, Horticultural Research Institute, Littlehampton, UK
1987-1989: Graduate Research Assistant, Horticultural Research Institute, Littlehampton, UK
1984-1987: Scientist, Indian Council of Agricultural Research, Solan, H.P., India

Top Honors and Awards:

2002: Syngenta Crop Protection Award, Society of Nematologists
2002: ESA Award for Excellence in Integrated Pest Management, NC Branch
2002: Distinguished Junior Faculty Research Award, OARDC
1999: OARDC Departmental Research Award for Innovation

Program capsules

Research: 1. Building an ecosystem approach to turfgrass management with a focus on biological control, cultural control, competitive exclusion, soil health, and plant health concepts. 2. Enhancing biocontrol potential of entomopathogenic nematodes through genetic engineering with a focus on environmental tolerance and longevity.
Teaching: Graduate courses in biological control (Ent 650), symbiosis and biological control (Ent 795), ecological nematology (Ent 694), and insect-microbe interactions (Ent 670).
Extension: Ecologically-based pest management and entomopathogenic, slug-parasitic, and foliar nematode education programs for turfgrass and landscape professionals and homeowners. Also organize a one-day Northeast Ohio Lawn Care Seminar.

Three most important scholarly accomplishments, Last 5 years

- Established and partially sequenced the first cDNA library of an entomopathogenic nematode; established a genetic linkage between stress tolerance and infective juvenile longevity; relationship between trehalose accumulation and cold or warm acclimation, and heat-shock response; the role of bacteria in the pathogenicity of slug-parasitic nematodes; lead book editor, *Nematodes as Biocontrol Agents*, CABI Publishing, UK, in press.
- Lead a collaborative project that demonstrated how insects mediate grass-weed interactions and established methodology to quantify specific alkaloids in endophyte infected turfgrasses as a tool to build effective host plant resistance against herbivores and competitiveness against weeds. This has lead to the formation of the Urban landscape Ecology Program.
- Built a research program on nematodes as bioindicators of soil health and established a new course on“Ecological Nematology” for students in Entomology, Plant Pathology, Natural Resources, and Environment Science programs.

Five selected publications (115 total):

Grewal, P. S. Power, K. T. Grewal, S. K., Suggars, A. & Haupricht, S. 2004. Enhanced consistency in biological control of white grubs with new strains of entomopathogenic nematodes. *Biol. Contr.* 30, 73-82.

Kunkel, B., Grewal, P. S. & Quigley, M. F. 2004. A mechanism of acquired resistance by the black cutworrm *Agrotis ipsilon* to an entomopathogenic nematode. *Biol. Contr.* 29, 100-08.

Richmond, D., Kunkel, B. A., Somasekhar, N. & Grewal, P. S. 2004. Top-down and bottom-up regulation of herbivores: *Spodoptera frugiperda* turns tables on endophyte-mediated plant defense and virulence of an entomopathogenic nematode. *Ecol. Entomol*. 29, 353-360.

Jagdale, G.B., Grewal, P.S. 2003. Acclimation of entomopathogenic nematodes to novel temperature: trehalose accumulation and the acquisition of thermotolerance. *Int. J. Parasitol.* 33, 145-152.

Grewal, P.S., Wang, X., Taylor, R.A.J. 2002. Dauer juvenile longevity and stress tolerance in natural populations of entomopathogenic nematodes: Is there a relationship? *Int. J. Parasitol*. 32, 717-725.

Five selected grants

USDA NC-IPM Developing an integrated pest management approach for lawns. P. S. Grewal, J. Cardina & D. S. Richmond. $96,500, 2004-06.

USDA-PMAP Implementing a novel biological approach for controlling plant-parasitic nematodes in turfgrass. P. S. Grewal, R. Giblin-Davis & W. Crow. $145,000; 2003-05.

USDA-NRICGP Longevity and stress tolerance of infective juvenile entomopathogenic nematodes. P. S. Grewal. $156,000; 2000-03.

USDA-NRICGP Building a biologically-based approach to manage insect and weed pests in turfgrass. P. S. Grewal & J. Cardina. $170,000; 2000-03.

USDA-PMAP Implementing insecticidal nematodes in nurseries, greenhouses and landscapes. P. S. Grewal, R. K. Lindquist & C. Young. $144,000; 2000-03.

Professional service highlights

2004-08: Vice Chair (to be Chair) of the Southern Regional Project S301 on Microbial Control

2004-06: Nematode Division Chair, International Society of Invertebrate Pathology

2003: Organizer and Program Chair, Third International Symposium on Entomopathogenic Nematodes and their Symbiotic Bacteria, Wooster, Ohio, Sept 4-7, 2003.

2001-present: International Editorial Board, *Biocontrol Science and Technology*

2001-04: Editorial Board, *Biological Control*

2001: Panel member, USDA-NRI Competitive Grants Program

1999-02: Editor, *Journal of Nematology,* USA

1999-02: Chair, Entomophilic Nematodes and Industry Committees, Society of Nematologists

Key Collaborations

- To establish genomic approaches to improve nematode bicontrol potential.
- To develop nematode-based biocontrol in turfgrass, vegetables, fruits, and ornamentals.
- To establish a new interdisciplinary, inter-college "Urban Landscape Ecology Program".
- With Agroecosystems Management Program, Organic Food and Farming Education and Research Program, and Department Project by providing soil health assessment through nematode trophic diversity analysis.