

# Second International Biofumigation Symposium

*Biofumigation: Pest Control for the Future*

June 25-29, 2006  
Moscow, Idaho, USA  
University of Idaho

Sponsored by:



Department of Plant, Soil  
& Entomological Sciences





## PROGRAM

**Sunday, 25 June 2006**

**6:00-7:30 PM** Welcome reception and registration, Iddings Agricultural Science Foyer

**Monday, 26 June 2006**

*(All oral and poster presentation will be in the University Commons)*

**8:00-9:30 AM** Registration, University Commons

**9:30-9:45 AM** Welcome and opening remarks, M.J. Morra, Univ. of Idaho, USA

**9:45-10:45 AM** Keynote Address 1, Glucosinolates and Chronic Disease Prevention. J.W. Fahey, Johns Hopkins Univ., USA.

**10:45-11:45 AM** Keynote Address 2, Evolution of Biofumigation Materials: From Plants Towards Biochemical Compounds. S. Palmieri, Italian Agricultural Research Council, Italy.

**11:45 AM-12:00 PM** Discussion

**12:00-1:00 PM** Lunch

**Oral Presentation Session 1, Glucosinolate/Myrosinase Biochemistry, Session Chair: H. Sørensen, The Royal Veterinary and Agricultural Univ., Denmark.**

**1:00-1:20 PM** Effect of Ascorbic Acid and Glutathione on the Production of Nitriles by Myrosinase. N. Bellostas\*, J.C. Sørensen, H. Sørensen, The Royal Veterinary and Agricultural Univ., Denmark.

**1:20-1:40 PM** Comparative Nematicidal Impact of Two Isothiocyanates: MITC and 2-Phenylethyl on Different States of Two Dreadful Nematodes, *Meloidogyne graminicola* and *Heterodera Sacchari*, H. Nabil\*, G. Reversat, ENFI-ESB, Morocco; IRD-LEST, France.

**1:40-2:00 PM** Environmental Impacts on the Biological Activity of Contrasting Isothiocyanates. J Matthiessen, CSIRO, Australia.

**2:00-2:20 PM** Glucosinolate and Isothiocyanate Concentrations in Soil Following Biofumigation. A.L. Gimsing\*, J.A. Kirkegaard, The Royal Veterinary and Agricultural Univ., Denmark; CSIRO, Australia.

**2:20-2:40 PM** Antifungal Volatiles Emitted from *Brassica juncea*-amended Soils Differing in Water Content. T. Takehara\*, H. Kanno, N. Obara, Y. Fujii, National Agricultural Research Center for Western Region, Japan; Miyagi Prefectural Ishinomaki Agricultural Extension Center, Japan; National Institute for Agro-Environmental Sciences, Japan.

**2:40-2:55 PM** Discussion

**2:55-3:10 PM** Break

**Oral Presentation Session 2, Pest Control with Green Manures, Session Chair: Carl E. Sams, Univ. of Tennessee, USA.**

- 3:10-3:30 PM** Separating Glucosinolate-related Suppression from Other Impacts of Mustard Biofumigants. J.A. Kirkegaard\*, A.L. Gimsing, J.F. Wang, S. Akiew, A. Young, CSIRO, Australia; The Royal Veterinary and Agricultural Univ., Denmark; The World Vegetable Center, Taiwan; Dept. of Primary Industries and Fisheries, Australia.
- 3:30-3:50 PM** Effects of *Brassica* Biofumigants on Celery and Onion Production Under Temperate Climate. M. Ngouajio\*, G. Wang, K.S. Charles, Michigan State University, USA.
- 3:50-4:10 PM** Biofumigants in Commercial Onion Production to Control Weed, Nematode and Disease Pests. B. Geary\*, B. Brown, C. Ransom, S. Hafez, Brigham Young Univ., USA; Utah State Univ., USA; Univ. of Idaho, USA.
- 4:10-6:00 PM** Poster Session 1 and social hour
- 6:30-7:30 PM** Dinner, University Commons
- 7:30-9:00 PM** Musical entertainment, Charles Houston Shattuck Arboretum

*Tuesday, 27 June 2006*

**Oral Presentation Session 3, Nematode and Insect Control, Session Chair: Ekaterini Riga, Washington State Univ., USA.**

- 8:20-8:40 AM** Comparison of Five Crops Used as Biofumigants to Manage Root-knot Nematodes in Tomato. A.T. Ploeg\*, J.A. Lopez-Perez, T. Roubtsova, S. Edwards, Univ. of California Riverside, USA.
- 8:40-9:00 AM** Two Decades of Green Manure Crop Research in Idaho for Nematode Management – An Overview. S. Hafez\*, P. Sundararaj, Univ. of Idaho, USA.
- 9:00-9:20 AM** Strategies for Using Green Manure Crops to Suppress Columbia Root-knot Nematode. R.E. Ingham\*, N.L. David, D.A. Horneck, M. Dillon, J. Delgado, Oregon State Univ., USA; Colorado State Univ., USA; USDA-ARS, USA.
- 9:20-9:40 AM** Effectiveness of Crop Rotation with Brassicaceae Species for the Management of the Southern Root-knot Nematode *Meloidogyne incognita*. G. Curto\*, L. Lazzeri, E. Dallavalle, R. Santi, L. Malaguti, Plant Protection Service, Italy; CRA-Research Institute for Industrial Crops, Italy.
- 9:40-10:00 AM** Evaluation of Field Pennycress as an Overwinter Green Manure Crop in Corn for Suppression of Western Corn Rootworm. S.F. Vaughn\*, T.A. Isbell, R. Stessman, R.W. Behle, USDA-ARS, USA.
- 10:00-10:20 AM** Break

**Oral Presentation Session 4, Pathogen Control, Session Chair: Mark Mazzola, USDA-ARS, USA.**

- 10:20-10:40 AM** Management of the Intercrop Period to Reduce Take-all Disease. S. Ennaïfar, P Lucas\*, J-M Meynard, D Makowski, UMR d'Agonomie INRA/INA P-G, France; UMR BIO3P INRA-Agrocampus, France; SAD-APT, France.
- 10:40-11:00 AM** Biofumigation for Controlling Soilborne Diseases of Tomato, Potato and Olive. L. Tsror (Lahkim)\*, S. Lebiush, M. Meshulam, E. Matan, L. Lazzeri, Agricultural Research Organization (ARO), Israel; R & D B'sor Experiment Station, Israel; CRA- Research Institute for Industrial Crops, Italy.
- 11:00-11:20 AM** Can Biofumigation Effectively Control Common Scab of Potato Under Field Conditions? R Gouws\*, F. C. Wehner, Agricultural Research Center, South Africa; Univ. of Pretoria, South Africa.
- 11:20-11:40 AM** The Impact of Mustard Cover Crop Rotations with Lettuce on the Incidence of Lettuce Drop Caused by *Sclerotinia minor*. R.F. Smith\*, K.V. Subbarao, S.T. Koike, T. Bensen, Univ. of California, USA.
- 11:40AM-12:00 PM** Soil Fumigation with *Allium* Sulfur Volatiles and *Allium* Byproducts. L.A. L.Arnould, G.F. G. du Fretay\*, F.V. F.Vey, A.T. A.Tissier, C.F. C. Fleurance, CRITT INNOPHYT, France; LNPV UFPS, France; SELT, France.

**12:00-1:00 PM** Lunch

**Oral Presentation Session 5, Waste Materials and Seed Meals as Biopesticides, Session Chair: John Kirkegaard, CSIRO, Australia.**

- 1:00-1:20 PM** Biofumigation for Soil-Borne Disease Management in Small-scale Vegetable Production of Asia. V. Justo\*, J. Kirkegaard, L.A. Lando, F. Abragan, J.J. Dangan, National Crop Protection Center, Univ. of the Philippines, Philippines; CSIRO, Australia.
- 1:20-1:40 PM** Herbicidal and Crop Phytotoxicity of Brassicaceae Seed Meals on Strawberry Transplants and Established Crops. J. Brown\*, M. Hamilton, J. Davis, D. Brown, L. Seip, Univ. of Idaho, USA.
- 1:40-2:00 PM** Contribution of Resident Soil Microorganisms to Brassicaceae Seed Meal-induced Disease and Weed Suppression. M. Mazzola\*, L. Hoagland, L. Carpenter-Boggs, R. Abi Ghanem, M. F. Cohen, USDA-ARS Tree Fruit Research Lab, USA; Washington State Univ., USA; Sonoma State Univ., USA.
- 2:00-2:20 PM** Brassicaceae Seed Meal Top-dressing - An Alternative to Bluegrass Burning? J. Davis\*, C. Seamons, J. Brown, D. Brown, L. Seip, Univ. of Idaho, USA.
- 2:20-2:40 PM** Cruciferous Materials in Biofumigation and Not Only....L. Lazzeri\*, L. Malaguti, CRA Research Institute for Industrial Crops, Italy.

**2:40-2:55 PM** Discussion

**2:55-3:10 PM** Break

**Oral Presentation Session 6, Commercialization and Technology Transfer, Session Chair:  
Luca Lazzeri, CRA Research Institute for Industrial Crops, Italy.**

**3:10-3:30 PM** Developing Designer Biofumigation *Brassica* Crops Through Interspecific Hybridization. L. Seip\*, D. Brown, N. Baker, J. Brown, J. Davis, Univ. of Idaho, USA

**3:30-3:50 PM** Nematode Suppression with Stoller Root Feed: An Alternative to Methyl Bromide. A. Liptay\*, J.H. Stoller, R.A. Salzman, Stoller Enterprises Inc, USA.

**3:50-4:10 PM** Extraction of High Erucic Oils, Proteins and Glucosinolates from Cruciferous Oilseeds. L. Ugolini, S. Palmieri\*, Italian Agricultural Research Council, Italy; Research Institute for Industrial Crops, Italy.

**4:10-6:00 PM** Poster Session 2 and social hour

**6:30-7:30 PM** Salmon Dinner, Administration Lawn

**7:30-9:00 PM** Native American entertainment, Administration Lawn

***Wednesday, 28 June 2006***

Field tour/Rapeseed and Canola Field Day, Univ. of Idaho Parker Farm

***Thursday, 29 June 2006***

**9:00 AM-12:00 PM** Workshop: Glucosinolates/Myrosinase: Analytical Techniques

**10:20-10:40 AM** Break

**9:00 AM-12:00 PM** Roundtable Discussion: Opportunities and Limitations of Biofumigation

**10:20-10:40 AM** Break

**To Be Arranged** Tour: Seed Crushing and Biodiesel Production Facilities

**12:00-1:00 PM** Lunch and closing remarks

**Monday, 26 June 2006, Poster Session 1**

**4:10-6:00 PM** University Commons

1. Sorption and Degradation of Benzyl and 2-Propenyl Isothiocyanates in Soil. A.L. Gimsing\*, B.W. Strobel, H.C.B. Hansen, The Royal Veterinary and Agricultural Univ., Denmark.
2. Potentially Mineralizable Nitrogen in Soils Amended with Biocidal Crops. R. Marchetti, L. Lazzeri\*, L. Malaguti, A. Orsi, L. Sghedoni. Agronomical Research Institute, Italy; Research Institute for Industrial Crops, Italy.
3. Microbial Community Structure of Biofumigated Soils. M.T. Lyons, C.E. Sams\*, C.S. Charron, A.D. Peacock, D.C. White. Univ. of Tennessee, USA.
4. Effect of Mustard Green Manure on Soil Microbiology in a Potato Cropping System. J. Nunez\*, M. Davis. University of California Cooperative Extension, USA.
5. Extraction of Glucosinolates Released in Soil. J.C. Sørensen\*, A.L. Gimsing, H.C.B. Hansen, H. Sørensen. Department of Natural Science, Denmark.
6. Preliminary Study on the Biofumigant Effects of *Brassica juncea* as Green Manure on *Rhizoctonia solani* and *Gaeumannomyces graminis* var. tritici. F. Montfort\*, F. Limache, N. Motisi. INRA (National Institute of agronomic research), France.
7. The Use of Arugula on its Own and in Combination with Synthetic Nematicides Against Plant Parasitic Nematodes of Potatoes. E. Riga\*, F. Pierce, H. Collins. Washington State Univ., USA.
8. *Brassica* Rotations for Managing Soilborne Potato Diseases in the Northeast. R.P. Larkin R. Lynch\*, T.S. Griffin, C.W. Honeycutt. USDA-ARS, New England Plant, Soil, and Water Laboratory, USA.
9. Effect of Mustard Green Manure Amendment on the Infectivity and Mortality of Two Entomopathogenic Nematode Genera, *Steinernema* and *Heterorhabditis*. D. Henderson\*, R. Ramirez\*, J. Brown, E. Riga, W.E. Snyder. Washington State Univ., USA; Univ. of Idaho, USA.
10. Potential Role of Brassicaceae Plant as Biofumigation Agent in Suppression of Potato Cyst Nematodes (*Globodera rostochiensis* cv. Woll). A. Aires, E. Rosa, R. Carvalho, C. Rodrigues. Univ. of Trás-os-Montes e Alto Douro, Portugal.
11. Mustard-derived Biofumigation for Lettuce in Coastal California. O. Daugovish, A.J. Downer\*, M.J. Mochizuki. Univ. of California Cooperative Extension, USA.
12. Glucosinolate Content of Selected Brassicaceae Grown in the Salinas Valley, California. R.F. Smith, T.A. Bensen\*, K.V. Subbarao, S.T. Koike. Univ. of California Cooperative Extension, USA; Univ. of California, USA.
13. Composition and Content of Glucosinolates in Rapeseed and In Vitro Inhibition of *Botrytis cinerea* Persoon. C.L. Zhang\*, F. Li, G.M. Li. Institute of Oil Crops Research, CAAS, China.

14. Intersatellite DNA Polymorphism in *A. alternata* Following Exposure to Lethal Concentrations of Isothiocyanates. Maria-Elena Baez-Flores\*, R. Troncoso-Rojas, B. Pryor, H.S. Garcia, M.E. Tiznado-Hernandez. Centro de Investigación en Alimentación y Desarrollo, Mexico; Univ. of Arizona, USA.
15. Myrosinase Immobilized by Plant Root-mucigel: Effect of Soil Water Status on the Enzyme Efficiency. C.E. Gessa, I. Braschi\*, S. Cinti, O. Leoni, S. Palmieri. Bologna Univ., Italy; Research Institute for Industrial Crops (ISCI-CRA), Italy.
16. Molecular Marker Associated with High Level of Sinigrin Content in Brown Mustard (*Brassica juncea*). E. Lionneton, G. Aubert, S. Ochatt, O. Merah\*. INRA, URGAP, France.
17. *Brassica juncea* Seed Meal for Fungus Gnats Control Associated with Houseplants with Consideration of Phytotoxicity to Specific Plant Species. J.P. McCaffrey\*, M.J. Morra, M.E. Main. Univ. of Idaho, USA.
18. Biofumigation as Alternative Method for Management Root-knot Nematode *Meloidogyne incognita* Affecting Tomato under Field Conditions. H.H. Ameen, M.M.M. Mohamed\*. National Research Center, Egypt.
19. Control of *Rhizoctonia solani* in Lily by Biofumigation with *Brassica* Seed Meal. G.J. Van Os\*, L. Lazzeri. Applied Plant Research, The Netherlands; CRA-ISCI, Italy.
20. Application of Brassicaceae Seed Meals for the Management of Apple Replant Disease. M. Mazzola\*, R. A. Ghanem. Washington State Univ., USA.

**Tuesday, 27 June 2006, Poster Session 2**  
**4:10-6:00 PM** University Commons

21. Efficacy of *Brassica* Biofumigation in Tomato Production. S.G. Harvey, C. E. Sams\*. Georgia Southwestern State Univ., USA; Univ. of Tennessee, USA.
22. Enhanced Biofumigation and Composting Systems for Strawberry. D. Deyton, T. Karpinets, M. Lyons, J. Cummins, C. Sams\*. Univ. of Tennessee, USA.
23. A Liquid Formulation as Biopesticide for the Control of California Red Scale (*Aonidiella aurantii* Maskell). D. Rongai, L. Lazzeri\*, C. Cerato, S. Palmieri, G. Patalano. Research Institute for Industrial Crops, Italy; Triumph Italia, Italy.
24. Production of Allyl isothiocyanate from Different Source and its Persistence in Soil. L. D'Avino, L. Lazzeri\*, C. Gaggi. CRA- Research Institute for Industrial Crops, Italy; Univ. of Siena, Italy.
25. Glucosinolate Degradation in Soil. A.L. Gimsing\*, J.C. Sørensen, B.W. Strobel, B.A. Halkier, H.C.B. Hansen. The Royal Veterinary and Agricultural University, Denmark.
26. Toxicity of Benzyl Glucosinolate and Benzyl Isothiocyanate to the Soil Dwelling Springtail *Folsomia fimetaria*. B. Styrishave, A.L. Gimsing\*, J. Jensen, H.C.B. Hansen. The National Environmental Research Institute, Denmark; The Royal Veterinary and Agricultural Univ., Denmark.
27. Effect of Mustard Green Manure on Nematodes. J. Nunez\*, University of California Cooperative Extension, USA.
28. In Vitro Screening of the Effect of Three Glucosinolate Derived Nitriles on Soil-borne Fungi. N. Bellostas\*, E. Casanova, J.M. Garcia-Mina, J.C. Sørensen, H. Sørensen. The Royal Veterinary and Agricultural University, Denmark; Inabonos, Group Roullier, Spain.
29. Proposal for an Analytical Method for the Quantitative Determination of Residues of Iso-thiocyanates in Preserved-Refrigerated Fruit. A. Bovolenta, M. Morelli. Arpa Emilia-Romagna sez. di Ferrara - Eccellenza Fitofarmaci, Italy.
30. Biofumigant Response to Phosphorus. B. Brown\*, B. Geary, M. Morra, V. Borek. Univ. of Idaho, USA.
31. Terra Protect – Biofumigation and Soil Protection with *Brassica* Blends. M. Schlathoelter\*. Terra Protect Seeds, Germany.
32. Advancing Biofumigation Research - The Need for Minimum Data Sets. J.A. Kirkegaard\*, J.N. Matthiessen. CSIRO, Australia.
33. Evaluation of Alternative Strategies for the Control of Root-knot Nematode *Meloidogyne incognita* (Kofoid et White) Chitw. on Tomato Crop, in Plastic Greenhouse. G. Curto\*, L. Lazzeri, R. Santi, E. Dallavalle. Plant Protection Service, Emilia-Romagna Region. Italy; CRA-Research Institute for Industrial Crops, Italy.

34. *Trichoderma* Strains Tolerant to *Brassica* Meals for a Combined Use in Biofumigation. S. Galletti\*, E. Sala, P. Burzi, S. Marinello, C. Cerato. Centro di Ricerca per le Coltura Industriali, Italy.
35. Glucosinolate-containing Seedmeals With Bioherbicidal Activity. S.F. Vaughn\*, D.E. Palmquist, M.A. Berhow. USDA-ARS, NCAUR, USA.
36. Large Scale Biofumigation of Fruit with Allyl-isothiocyanate from *Brassica* Meals for Controlling Postharvest Pathogens: Preliminary Results. O. Leoni\*, M. Mari, R. Bernardi, L. Casalini, S. Cinti, N. Aliano, S. Palmieri. Research Institute for Industrial Crops (ISCI-CRA), Italy; Univ. of Bologna, Italy.
37. Weed Suppression in Potting Soil Amended with Dried Distillers Grains. R.A.Boydston\*, S.F. Vaughn, H.P. Collins. USDA-ARS, IAREC, USA.
38. The Effect of Glucosinolate Type and Quantity on Weed Seed Germination and Growth in Glasshouse Studies. D. Brown \*, J. Brown, M. Hamilton, J. Davis, L. Seip. Univ. of Idaho, USA.
39. Brassicaceae Seed Meals as a Nitrogen Source in Carrot and Strawberry Production. A.S. Snyder \*, J.L. Johnson-Maynard, M.J. Morra. Univ. of Idaho, USA.