

NIKLAUS J. GRÜNWARD

Horticultural Crops Research Laboratory,
USDA ARS, 3420 NW Orchard Ave., Corvallis, OR 97330;

EDUCATION

- 1997 Ph.D., Ecology/Plant Pathology, University of California, Davis. GPA: 4.0
1992 B.Sc., Plant Science, University of California, Davis and University of Zürich. Summa Cum Laude.

RESEARCH EXPERIENCE

- 7/2004 – present Research Plant Pathologist, USDA-ARS, Corvallis, OR
7/2007 – present Associate Professor (Courtesy), Dept. Botany & Plant Pathology/Center for Genome Research and Biocomputing/Molecular and Cellular Biology Graduate Program, Oregon State University, Corvallis, OR
7/2004 – 2007 Assistant Professor (Courtesy), Oregon State University, Corvallis, OR
7/2001 – 6/2004 Research Plant Pathologist, USDA-ARS, WSU Prosser, WA
7/2001-6/4 Adjunct Professor, Dept. Plant Pathology, Washington State University, Prosser, WA
3/97 – 7/2001 Research Associate IV, Plant Pathology Department, Cornell University

ACADEMIC SERVICE

- Editor-in-chief, Phytopathology, American Phytopathological Society, 2009-11.
- Senior Editor, Phytopathology, American Phytopathological Society, 2006-8.
- Editor, Plant Pathology, British Society of Plant Pathology, 2005-2010.
- Committee chair, Genetics Committee, American Phytopathological Society (APS), 2005-6.
- Ad-hoc proposal reviewer, BARD US-Israel program, 2005.
- Ad-hoc proposal reviewer, NRI Biology of Plant-Microbe interactions, 2005.
- Panel member, NSF-Small Business Innovation Research Grant Program, January 2004.
- Ad hoc proposal reviewer, NSF, DEB Ecology, 2002.
- Chair, Epidemiology Committee, American Phytopathological Society (APS), 1999-2000.

PROFESSIONAL AFFILIATIONS

- American Phytopathological Society (APS), International Society for Plant Pathology (ISPP), American Association for the Advancement of Science (AAAS)

HONORS/AWARDS/FELLOWSHIPS

- Syngenta Award, American Phytopathological Society (APS), 2007.
- Young Career Scientist of the Year Award, USDA ARS, Pacific West Area, 2006.
- Summa Cum Laude, UC Davis, 1992 and 1997.
- Henry A. Jastro Fellowship, UC Davis, 1994, 95, 96. \$ 24,000.-
- Jastro-Shields Graduate Research Scholarship, UC Davis, 1994, 95. \$4,000.-
- Travel award for presenting at Ecological Society of America meeting, UC Davis, 1996. \$300.-
- Travel Awards for presenting at APS Meeting, APS Foundation, 1996. \$200.-
- Sustainable Agriculture Graduate Award, 1992. \$2,000.-

- Sigma-Xi Honor Society, 1996.
- Phi-Kappa-Phi Honor Society, 1991.
- Invited speaker competitively chosen for Colloquium on 'Graduate Student Contributions to Plant Disease Epidemiology and the Ecology of Plant Pathogens', APS Meeting, Indianapolis, IN, 1996.
- Departmental citation for outstanding performance in recognition of undergraduate accomplishment in Agricultural Science, UC Davis, 1992.

LANGUAGES

- Multi-lingual: English, French, Spanish, German/Swiss German.

CURRENT GRANT SUPPORT

- **Grunwald**, Carrington and Tyler. Genome-wide functional analysis of *Phytophthora* small RNAs. USDA NRI: Functional Genomics of Microbes, 2008-10, **\$990,000**.
- Parke and **Grunwald**. Determining the efficacy of a systems approach for producing nursery stock free of plant pathogenic *Phytophthora* species. Floriculture Nursery Initiative, 2007-9, **\$224,000**.
- **Grunwald** and Hansen. Monitoring migration, population structure and evolution of the Sudden Oak Death pathogen *Phytophthora ramorum* in North America. USDA Forest Service, 2006-9 **\$267,885**
- **Grunwald**: Comparative epidemiology of *Phytophthora* pathogens on *Rhododendron*, NW Nursery Crops Research Program, 2008, **\$29,961**.
- **Grunwald**: Assessing the threat of exotic relative to endemic *Phytophthora* spp. Oregon Dept. Agr./Oregon Assoc. Nurseries Research Program, 2008, **\$22,000**.

SELECTED INVITED PRESENTATIONS

- Genetics and Evolution of *Phytophthora ramorum*. Canadian Society of Phytopathology, BC Chapter Meeting, Victoria, BC, 2008.
- Late Blight of Potato: Past, Present, and Future. APS Centennial Meeting, Symposium, 2008.
- Contrasting two plant destroyers with differing appetites: *Phytophthora infestans* and *P. ramorum*. Departmental seminar, UC Davis, 2007.
- Population divergence in *Phytophthora ramorum*, Mycological society of America, Symposium, 2006.
- Evolution and structure of populations of *Phytophthora infestans* and relatives at their center of origin, APS Symposium, 2006.
- Impact and biology of *Phytophthora ramorum*, APS Pacific Division Symposium, 2006.
- Biology of *Phytophthora infestans* at the center of origin. Departmental seminar, UC Riverside, 2006.
- Biology of *Phytophthora infestans* at the center of origin. Departmental seminar, Penn State, 2005.
- The social impact of fungal diseases: From the Irish potato famine to sudden oak death. APS Symposium, 2005.
- Effect of cover crop decomposition on on soil microbial and plant pathogen dynamics. APS Symposium, 2004.
- Exploring the relationship between alleles and epidemics: the case of potato late blight, APS Symposium, 2003.

- Population structure of *A. euteiches* using molecular markers and phenotypic diversity analysis. INRA-USDA Collaborative Meeting on Aphanomyces Root Rot, Le Rheu, France, 2002.
- Detection of *A. euteiches* in pea using quantitative PCR. INRA-USDA Collaborative Meeting on Aphanomyces Root Rot, Le Rheu, France, 2002.
- Resistance tests to *A. euteiches* in controlled conditions at USDA-Prosser and INRA-Le Rheu. INRA-USDA Collaborative Meeting on Aphanomyces Root Rot, Le Rheu, France, 2002.
- Fusarium Root Rot, Symposium, The Current State of Legume Pathology, Washington State University, Pullman, WA, 2002.
- The biology of Potato Late Blight at the Center of Origin. Crop and Soil Sciences Department, Washington State University, Pullman, WA, 2002.

PEER-REVIEWED PUBLICATIONS (2005-PRESENT)

- Goss, E.M., I. Carbone, and N.J. **Grünwald**. 2009. Ancient isolation and independent evolution of the three clonal lineages of the exotic sudden oak death pathogen *Phytophthora ramorum*. *Mol. Ecol.*:in press.
- B. J. Haas, S. Kamoun, M. C. Zody, R. H.Y. Jiang, R. E. Handsaker, L. M. Cano, M. Grabherr, C. D. Kodira, S. Raffaele, T. Torto-Alalibo, T. O. Bozkurt, A. M.V. Ah-Fong, L. Alvarado, V. L. Anderson, M. R. Armstrong, A. Avrova, L. Baxter, J. Beynon, P. C Boevink, S. R. Bollmann, J. I.B. Bos, Broad Institute Genome Sequencing Platform, V. Bulone, G. Cai, C. Cakir, J. C. Carrington, M. Chawner, L. Conti, S. Costanzo, R. Ewan, N. Fahlgren, J. Fugelstad, E. M. Gilroy, S. Gnerre, P. J. Green, L. J. Grenville-Briggs, J. Griffith, N. J. **Grünwald**, K. Horn, N. R. Horner, C.-H. Hu, E. Huitema, D.-H. Jeong, A. M.E. Jones, J. D.G. Jones, R. W. Jones, E. K. Karlsson, S. G. Kunjeti, K. Lamour, Z. Liu, L. Ma, D. MacLean, C. Marcus, H. McDonald, J. McWalters, H. J.G. Meijer, W. Morgan, P. F. Morris, C. A. Munro, K. O'Neill, M. Ospina-Giraldo, A. Pinzón, L. Pritchard, B. Ramsahoye, Q. Ren, S. Restrepo, S. Roy, A. Sadanandom, A. Savidor, S. Schornack, D. C. Schwartz, U. D. Schumann, B. Schwessinger, L. Seyer, T. Sharpe, C. Silvar, J. Song, D. J. Studholme, S. Sykes, P. J.I. van de Vondervoort, P. Vipaporn, S. Wawra, R. Weide, J. Win, C. Young, S. Zhou, W. Fry, B. C. Meyers, P. van West, J. Ristaino, F. Govers, P. R. J. Birch, S. C. Whisson, H. S. Judelson, C. Nusbaum. 2009. Genome sequence and comparative analysis of the Irish potato famine pathogen *Phytophthora infestans*. *Nature*, accepted pending revision.
- Elliott, M., G. Sumampong, A. Varga, S.F. Shamoun, D. James, S. Masri, S.C. Briere, and N.J. **Grünwald**. 2009. PCR-RFLP markers identify three lineages of the North American and European populations of *Phytophthora ramorum*. *Canadian Journal of Plant Pathology-Revue Canadienne De Phytopathologie*:in press.
- Grünwald**, N. J., Goss, E. M., and Press, C. M. 2008. *Phytophthora ramorum*: a pathogen with a remarkably wide host range causing sudden oak death on oaks and ramorum blight on woody ornamentals. *Mol. Plant Pathol.* 9: 729–740.
- Malvick, D. K., **Grünwald**, N. J., and Dyer, A. T. 2009. Population structure, races, and host range of *Aphanomyces euteiches* from alfalfa production fields in the central USA. *Europ. J. Plant Pathol.* 123:171–182.
- Romero-Montes, G., Lozoya-Saldana, H., Mora-Aguilera, G., Fernandez-Pavia, S., **Grünwald**, N. J. 2008. Environment and slow epidemics favor oosporulation of *Phytophthora infestans* Mont. De Bary, on potato leaves in the Toluca Valley, Mexico. *American J. Potato Res.* 85: 101-109.

- Park, J., Park, B., Veeraraghavan, N., Jung, K., Lee, Y.-H., Blair, J.E., Geiser, D.M., Isard, S., Mansfield, M.A., Nikolaeva, E., Park, S.-Y., Russo, J., Kim, S.H., Greene, M., Ivors, K.L., Balci, Y., Peiman, M., Erwin, D.C., Coffey, M.D., Rossman, A., Farr, D., Cline, E., **Grünwald**, N.J., Luster, D.G., Schrandt, J., Martin, F., Ribeiro, O.K., Makalowska, I., and Kang, S. 2008. Phytophthora database: A forensic database supporting the identification and monitoring of Phytophthora. *Plant Dis.* 92, 966-972.
- Kohn, L. M., Anderson, J. B., Schaffer, M., and **Grünwald**, N. J. 2008. Marker stability throughout 400 days of hyphal growth of *Sclerotinia sclerotiorum*. *Fungal Genetics and Biology* 45:613-617.
- Coyne, C. J., Porter, L. D., Inglis, D. A., **Grünwald**, N. J., McPhee, K. E. and Muehlbauer, F. J. 2008. Registration of W6 26740, W6 26743 and W6 26745 green pea germplasm resistant to *Fusarium* root rot. *Journal of Plant Registrations* 2: 137 - 139.
- Grünwald**, N. J., Goss, E. M., Larsen, M. M., Press, C. M., McDonald, V. T., Blomquist C. and Thomas, S. L. 2008. First report of the European lineage of *Phytophthora ramorum* in a California nursery. *Plant Disease* 2:314-314.
- Grünwald**, N. J., Kitner, K., McDonald, V. and Goss, E. M. 2008. Susceptibility in *Viburnum* to *Phytophthora ramorum*. *Plant Disease* 92:210-214.
- Kohn, L. M., Anderson, J. B., Schaffer, M., and **Grünwald**, N. J. 2007. Marker stability throughout 400 days of hyphal growth of *Sclerotinia sclerotiorum*. *Fungal Genetics and Biology* doi:10.1016/j.fgb.2007.09.013.
- Akamatsu, H. O., **Grünwald**, N. J., Chilvers, M. I., Porter, L. D., Peever, T. L. 2007. Development of codominant simple sequence repeat, single nucleotide polymorphism and sequence characterized amplified region markers for the pea root rot pathogen, *Aphanomyces euteiches*. *Journal of Microbiological Methods* 71:82-86.
- Romero-Montes, G., Lozoya-Saldaña, H., Mora-Aguilera, G., Fernández-Pavía, S., **Grünwald**, N. J. 2007. Oospore formation of *Phytophthora infestans* on potato foliage in the Toluca Valley. *Am. J. Potato Research*, in press.
- Prospero, S., Hansen, E. M., **Grünwald**, N. J., and Winton, L. M. 2007. Population dynamics of the sudden oak death pathogen *Phytophthora ramorum* in Oregon from 2001 to 2004. *Molecular Ecology*, in press.
- Garay-Serrano, E., Fernández-Pavía, S. P., Rodríguez-Alvarado, G., Flier, W. G., Lozoya-Saldaña, H., Rojas-Martínez, R. I., Goss E. M., and **Grünwald**, N. J. 2007. First Report of haplotype I-b of *Phytophthora infestans* in central Mexico. *Plant Disease* 91:909-909.
- Malvárez, G., Carbone, I., **Grünwald**, N. J., Subbarao, K. V., Schafer, M., and Kohn, L. M. 2007. New populations of *Sclerotinia sclerotiorum* from lettuce in California and peas and lentils in Washington. *Phytopathology* 97:470-483.
- Romero-Montes, G., Lozoya-Saldaña, H., Mora-Aguilera, G., Fernández-Pavía, S., **Grünwald**, N. J. 2007. Oospore formation of *Phytophthora infestans* on potato foliage in the Toluca Valley. *Am. J. Potato Research*, in press.
- Cadena-Hinojosa, M. A., Diaz-Valasis, M., Guzman-Plazola, R. A., Fernandez-Pavia, S., **Grünwald**, N. J. 2007. Late blight resistance of five Mexican potato cultivars in the eastern Sierra of the state of Mexico. *American Journal of Potato Research*, 84: 385-392.
- Grünwald**, N. J., Sturbaum, A. K., Romero Montes, G., Garay Serrano, E., Lozoya-Saldaña, H., and Fry, W. E. 2006. Selection for fungicide resistance in a recombining population of *Phytophthora infestans*. *Phytopathology* 96:1397-1403.

- Grünwald**, N. J. and G.-A. Hoheisel. 2006. Hierarchical analysis of diversity, selfing and genetic differentiation in populations of the oomycete *Aphanomyces euteiches*. *Phytopathology* 96:1134-1141.
- Garnica, D. P., Pinzon, A. M., Quesada-Ocampo, L. M., Bernal, A. J., Barreto, E., **Grünwald**, N. J., and Restrepo, S. 2006. Survey and analysis of microsatellites from transcript sequences in *Phytophthora* species: frequency, distribution, and potential as markers for the phylum Oomycota. *BMC Genomics* 7:245.
- Tyler, B. M., Tripathy, S., Zhang, X., Dehal, P., Jiang, R. H. Y., Aerts, A., Arredondo, F. D., Baxter, L., Bensasson, D., Beynon, J. L., Chapman, J., Damasceno, C. M. B., Dorrance, A. E., Dou, D., Dickerman, A. W., Dubchak, I. L., Garbelotto, M., Gijzen, M., Gordon, S. G., Govers, F., **Grünwald**, N. J., Huang, W., Ivors, K. L., Jones, R. W., Kamoun, S., Krampis, K., Lamour, K. H., Lee, M.-K., McDonald, W. H., Medina, M., Meijer, H. J. G., Nordberg, E. K., Maclean, D. J., Ospina-Giraldo, M. D., Morris, P. F., Phuntumart, V., Putnam, N. H., Rash, S., Rose, J. K. C., Sakihama, Y., Salamov, A. A., Savidor, A., Scheuring, C. F., Smith, B. M., Sobral, B. W. S., Terry, A., Torto-Alalibo, T. A., Win, J., Xu, Z., Zhang, H., Grigoriev, I. V., Rokhsar, D. S., and Boore, J. L. 2006. *Phytophthora* genome sequences uncover evolutionary origins and mechanisms of pathogenesis. *Science* 313 (5791):1261-1266.
- Kang, S. Blair, J. E., Geiser, D. M., Khang, C.-H., Park, S.-Y., Gahegan, M., O'Donnell, K., Luster, D.G., Kim, S. H., Ivors, K.L., Lee, Y.-H., Lee, Y.-W., **Grünwald**, N.J., Martin, F.M., Coffey, M.D., Veeraraghavan, N., and Makalowska, I. 2006. Plant pathogen culture collections: It takes a village to preserve these resources vital to the advancement of agricultural security and plant pathology. *Phytopathology* 96:920-925.
- Infantino, A., Kharrat, M., Riccioni, L., Coyne, C. J., McPhee, K. E., and **Grünwald**, N. J. 2006. Screening techniques and sources of resistance to root diseases in cool season food legumes. *Euphytica* 147: 201-221.
- Miklas, P.N., J. Hu, N.J. **Grünwald**, and K.M. Larsen. 2006. Potential Application of TRAP (targeted region amplified polymorphism) Markers for Mapping and Tagging Disease Resistance Traits in Common Bean. *Crop Science*, in press.
- Grünwald**, N.J., and W.G. Flier. 2005. The biology of *Phytophthora infestans* at its center of origin. *Annual Review of Phytopathology*. 43:171-190.
- Andrade-Piedra, J.L., G.A. Forbes, D. Shtienberg, N.J. **Grünwald**, M.G. Chacón, M.V. Taípe, R.J. Hijmans, and W.E. Fry. 2005. Qualification of a plant disease simulation model: performance of the LATEBLIGHT model across a broad range of environments. *Phytopathology*. 95:1412-1422.
- Vandemark, G.J., and N.J. **Grünwald**. 2005. Use of real-time PCR to examine the relationship between disease severity in pea and *Aphanomyces euteiches* DNA content in roots. *European Journal of Plant Pathology*. 111:309-316.
- Vandemark, G.J., and N.J. **Grünwald**. 2004. Reaction of *Medicago truncatula* to *Aphanomyces euteiches* race 2. *Archives of Phytopathology and Plant Protection*. 37:59-67.
- Badillo-Ponce, G., S.P. Fernandez-Pavia, N.J. **Grünwald**, E. Garay-Serrano, G. Rodriguez-Alvarado, and H. Lozoya-Saldana. 2004. First report of blight on *Ipomoea purpurea* caused by *Phytophthora ipomoeae*. *Plant Dis.* 88:1283.

SELECTED BOOK CHAPTERS (2002-PRESENT)

Grünwald, N. J., Chen, W., and Larsen, R.C. 2004. Pea Diseases and their Management. In: Disease Management of Fruits and Vegetables. II. Vegetable Diseases, edited by S. A. M. H. Naqvi and K. G. Mukerji. Dordrecht, The Netherlands: Kluwer Academic Publishers. Pp. 301-331.

Grünwald, N. J. 2009. Genetics and Evolution of the Sudden Oak Death pathogen *Phytophthora ramorum*. In: Oomycete Genetics and Genomics: Biology, Interactions with Plants and Animals, and Toolbox. Eds.: K. H. Lamour and S. Kamoun. Invited Book Chapter, to be submitted March.

Fry, W. E., **Grünwald, N. J.,** Forbes, G. A., Cooke, D. E. L., and Mcleod , A. 2009. Population Genetics and population diversity of *Phytophthora infestans*. In: Oomycete Genetics and Genomics: Biology, Interactions with Plants and Animals, and Toolbox. Eds.: K. H. Lamour and S. Kamoun. In press.

TECHNOLOGY TRANSFER

Parke, J., Pscheidt, J., Regan, R., **Grünwald, N. J.** *Phytophthora* e-campus short course. In press through e-campus at Oregon State University, release date: 2008.