

2003
Publications of Agricultural Research Center Scientists
by Department and Project
Agricultural Research Center Washington State University

Agricultural Research Center:

0356 JOINTED GOATGRASS: A THREAT TO U.S. WHEAT PRODUCTION

Pester, T.A., S.M. Ward, P. Westra, and S.J. Nissen. 2003. Genetic Diversity of Jointed Goatgrass (*Aegilops cylindrica*) Determined with RAPD and AFLP Markers. *Weed Science*. 51:287-293.

0379 AQUACULTURE, WASHINGTON

Phillips R.B., A. Zimmerman, M. Noakes, Y. Palti, M. Morasch, L. Eiben, S. Ristow, G. Thorgaard, and J.D. Hansen. 2003. Physical and Genetic Mapping of the Rainbow Trout Major Histocompatibility Regions: Evidence for the Duplication of the Class I Region. *Immunogenetics*. 55:561-569.

Lafentz B., S. LaPatra, G. Jones, and K. Cain. 2003. Passive Immunization of Rainbow Trout (*Oncorhynchus mykiss*) Against *Flavobacterium Psychrophilum*, the Causative Agent of Coldwater Disease and Rainbow Trout Fry Syndrome. *Journal of Fish Diseases*. 26:377-384.

0393 JOINTED GOATGRASS: A THREAT TO U.S. WHEAT PRODUCTION

Frandrich, L., and C. Mallory-Smith. 2003. Germination Response of Spring and Winter Cohorts of Jointed Goatgrass (*Aegilops cylindrica*). *Proceedings of the Western Society of Weed Science*. 56:68.

Kroiss, L.J., P. Tempali, M.I. Vales, O. Riera-Lizarazu, C.A. Mallory-Smith, J.L.Hansen, and R.S. Zemetra. 2003. Molecular Evidence for the Retention of Wheat Chromatin in Wheat by Jointed Goatgrass Backcrosses. *Proceedings of the Western Society of Weed Science*. 56:94.

0433 AQUACULTURE, IDAHO AND WASHINGTON

Phillips R.B., A. Zimmerman, M. Noakes, Y. Palti, M. Morasch, L. Eiben, S. Ristow, G. Thorgaard, and J.D. Hansen. 2003. Physical and Genetic Mapping of the Rainbow Trout Major Histocompatibility Regions: Evidence for the Duplication of the Class I Region. *Immunogenetics*. 55:561-569.

Lafentz B., S. LaPatra, G. Jones, and K. Cain. 2003. Passive Immunization of Rainbow Trout (*Oncorhynchus mykiss*) Against *Flavobacterium Psychrophilum*, the Causative Agent of Coldwater Disease and Rainbow Trout Fry Syndrome. *Journal of Fish Diseases*. 26:377-384.

0557 AQUACULTURE, IDAHO AND WASHINGTON

Phillips R.B., A. Zimmerman, M. Noakes, Y. Palti, M. Morasch, L. Eiben, S. Ristow, G. Thorgaard, and J.D. Hansen. 2003. Physical and Genetic Mapping of the Rainbow Trout Major Histocompatibility Regions: Evidence for the Duplication of the Class I Region. *Immunogenetics*. 55:561-569.

Lafentz, B., S. LaPatra, G. Jones, and K. Cain. 2003. Passive Immunization of Rainbow Trout (*Oncorhynchus mykiss*) Against *Flavobacterium Psychrophilum*, the Causative Agent of Coldwater Disease and Rainbow Trout Fry Syndrome. *Journal of Fish Diseases*. 26:377-384.

Agricultural Resources and Economics:

0160 AGRICULTURAL WATER MANAGEMENT TECHNOLOGIES, INSTITUTIONS AND POLICIES AFFECTING ECONOMIC VIABILITY AND ENVIRONMENTAL QUALITY

Huffaker, R.G., and N. Whittlesey. 2003. An Analysis of Economic Incentive Policies to Encourage Agricultural Water Conservation. *International Journal of Water Resources Development*. March: 37-53.

0218 EMPIRICAL LIKELIHOOD, MAXIMUM ENTROPY, ESTIMATING EQUATIONS, AND OTHER COMPUTER INTENSIVE METHODS FOR AGRICULTURAL ECONOMICS RESEARCH

Heckelei, T., and R. Mittelhammer. 2003. Bayesian Bootstrap Multivariate Regression. *Journal of Econometrics*. 112:241-264

Mittelhammer, R., and G. Judge. 2003. Some Empirical Evidence on EL-Weighted Combinations of Structural Equation Estimators. *Journal of Agricultural and Applied Economics*. 35:91-101.

0275 AGRICULTURAL PRODUCTION, PROCESSING, TRADE, AND ENVIRONMENTAL QUALITY

Nkunzimana, S., H.A. Love, and C.R. Shumway. 2003. Mexican Agricultural Trade under the GATT. *Applied Economics*. 35:449-59.

0278 SELECTING OPERATIONAL PARAMETERS WHICH BOTH IMPACT AND MONITOR AGRIBUSINESS PERFORMANCE

Monson, J., K.D. Duft, K.L Casavant, and E. Jessup. 2003. Cooperative Structure, Performance, and Economies of Size; A Northwest Perspective. *The Cooperative Accountant's Journal*. Winter: 13-26.

0299 FISHERIES MANAGEMENT AND MARKETING OF MARINE AND AQUACULTURE SEAFOOD

Matulich, S.C., and M.L. Clark. 2003. North Pacific Halibut and Sablefish IFQ Policy Design: Quantifying the Impacts on Processors. *Marine Resource Economics*. 18:149-166.

0317 WINE GRAPE ECONOMIC RESEARCH

Folwell, R.J., and M. Volanti. 2003. The Changing Market Structure of the U.S.A. Wine Industry. *Journal of Wine Research*. 14:25-30.

0347 RESEARCH DESIGN AND MANAGING RISK IN AGRICULTURAL CONSERVATION AND PEST MANAGEMENT SYSTEMS

Smith, E.G.. and D.L. Young. 2003. Cropping Diversity along the U.S.-Canada Border. *Review of Agricultural Economics*. Spring/Summer: 154-167.

Upadhayay, B.M., D.L. Young, H.H. Wang, and P.R. Wandschneider. 2003. How Do Farmers Who Adopt Multiple Conservation Practices Differ from Their Neighbors? *American Journal of Alternative Agriculture*. 18:27-36.

0448 BENEFITS AND COSTS OF NATURAL RESOURCES POLICIES AFFECTING PUBLIC AND PRIVATE LANDS

Loureiro, M.L., J.J. McCluskey, and R.C. Mittelhammer. 2003. Are Stated Preferences Good Predictors of Market Behavior? *Land Economics*. 79:44-55.

McCluskey, J.J., and G.C. Rausser. 2003. Stigmatized Asset Value: Is it Temporary or Permanent? *The Review of Economics and Statistics*. 85:276-285.

McCluskey, J.J., and G.C. Rausser. Hazardous Waste Sites and Housing Appreciation Rates. 2003. *Journal of Environmental Economics and Management*. 45:166-176.

0539 ECONOMICS, INFORMATION, AND INSTITUTIONAL DESIGN FOR NATURAL RESOURCES AND THE ENVIRONMENT

Yoder, J.K., D. Engle, M. Tilley, and S. Fuhlendorf. 2003. The Economic Logic of Prescribed Burning Law and Regulation. *Journal of Range Management*. 56:306-313.

Yoder, J.K., M. Tilley, D. Engle, and S. Fuhlendorf. 2003. Prescribed Fire Economics and Law in the United States. *Review of Agricultural Economics*. 25:218-233.

0540 COLLECTIVE REPUTATION: FIRM INCENTIVES AND EMPIRICAL ANALYSIS

McCluskey, J.J., and M.L. Loureiro. 2003. Consumer Preferences and Willingness to Pay for Food Labeling: a Discussion of Empirical Studies. *Journal of Food Distribution Research*. 34:95-102.

Quagraine, K., J.J. McCluskey, and M.L. Loureiro. 2003. A Latent Approach to Measuring Reputation. *Southern Economic Journal*. 67:966-977.

0549 ANALYZING THE COMPETITIVE POSITION OF THE WASHINGTON WINE GRAPE INDUSTRY

Folwell, R.J., and M. Volanti. 2003. The Changing Market Structure of the USA Wine Industry. *Journal of Wine Research*. 14:25-30.

0806 FRUIT AND VEGETABLE SUPPLY-CHAIN MANAGEMENT, INNOVATIONS, AND COMPETITIVENESS

van Voorthuizen, H., R.T. Schotzko, and R.C. Mittelhammer. 2003. Measuring the Impact of Advertising and Promotion: Single or Multi-Equation Systems? A Case Study of the Washington Apple Industry. *Journal of Food Distribution Research*. 34:134-152.

0998 RURAL COMMUNITIES, RURAL LABOR MARKETS AND PUBLIC POLICY

Yeo, J.-H., and D. Holland. 2003. Economic Growth in Washington: An Examination of Labor Market and Fiscal Response. *Journal of Regional Analysis and Policy*. 32:1-31.

Animal Science:

0374 NUTRIENT MANAGEMENT: FEEDING FOR REDUCED EXCRETION OF NUTRIENTS BY RUMINANTS

Hostetler, C.E., R.L. Kincaid, and M.A. Mirando. 2003. The Role of Essential Trace Elements on Embryonic and Fetal Development in Food Animals. *The Veterinary Journal*. 166:125-139.

Kincaid, R.L., L.E. Lefebvre, J.D. Cronrath, M.T. Socha, and A.B. Johnson. 2003. Effect of Dietary Cobalt Supplementation on Cobalt Metabolism and Performance of Dairy Cattle. *Journal of Dairy Science*. 86:1405-1414.

0389 GENETIC ASPECTS OF INNATE IMMUNITY IN RAINBOW TROUT

Phillips, R., A. Zimmerman, M. Noakes, Y. Palti, R.B. Phillips, M.R.W. Morasch, L. Eiben, S.S. Ristow, G.H. Thorgaard, and J.D. Hansen. 2003. Physical and Genetic Mapping of the Rainbow Trout Major Histocompatibility Regions: Evidence for Duplication of the Class I Region. *Immunogenetics*. 55:561-569.

0706 GERM CELL AND EMBRYO DEVELOPMENT AND MANIPULATION FOR THE IMPROVEMENT OF LIVESTOCK

Jiang, Z.H., M. Zhang, V.D. Wasem, J.J. Michal, H. Zhang, and R.W. Wright Jr. 2003. Census of Genes Expressed in Porcine Embryos and Reproductive Tissues by Mining EST Database Based on the Human Genes. *Biology of Reproduction*. 69:1177-1182.

Phillips, G.J., T.L. Citron, J.S. Sage, K.A. Cummins, M.J. Cecava and J.P. McNamara. 2003. Adaptations in Body Muscle and Fat in Transition Dairy Cattle Fed Differing Amounts of Protein and Methionine Hydroxy Analog. *Journal of Dairy Science*. 86:3634-3647.

0913 MOLECULAR MECHANISMS REGULATING SKELETAL MUSCLE GROWTH AND DIFFERENTIATION

Vierck, J., D. Icenoglu, L. Bucci, and M.V. Dodson. 2003. The Effects of Ergogenic Compounds on the Proliferation and Differentiation of Satellite Cells. *Medicine Science Sports Exercise*. 35:769-776.

0957 REPRODUCTIVE PERFORMANCE IN DOMESTIC RUMINANTS

Hill, R.E., D.M. de Avila, K.P. Bertrand, N.M. Greenberg, and J.J. Reeves. 2003. Immunization Against Luteinizing Hormone-Releasing Hormone Fusion Proteins does not Decrease Prostate Cancer in the Transgenic Adenocarcinoma Mouse Prostate Model. *Experimental Biology and Medicine*. 228:818-822.

Schmittgen, T.C., B.A. Zakrajsek, R.E. Hill, Q. Liu, J.J. Reeves, P.D. Axford, M.J. Singer, and M.W. Reed. 2003. Expression Pattern of Mouse Homolog of Prostate-Specific Membrane Antigen (FOLHI) in the Transgenic Adenocarcinoma of the Mouse Prostate Model. *The Prostate*. 55:308-316.

Ulker, H., O. Gokdal, T. Aygun, F. Karakus, D.M. deAvila, and J.J. Reeves. 2003. Feedlot Performance and Carcass Characteristics of Ram Lambs Immunized Against Recombinant LHRH Fusion Proteins at 10 Weeks of Age. *Small Ruminant Research*. 50:213-218.

Biological Systems Engineering:

0352 A WATERSHED SCALE STUDY ON NO-TILL FARMING SYSTEM FOR REDUCING SEDIMENT DELIVERY

Wang, G., S. Chen, and J. Boll. 2003. A Semi-Analytical Solution of the Saint-Venant Equations for Channel Flood Routing. *Water Resources Research*. 39:1076-1085.

0357 USE OF SIMULATION MODELING AND OTHER COMPUTER-BASED TOOLS FOR DECISION SUPPORT IN THE MANAGEMENT OF AGRICULTURAL SYSTEMS

Donatelli, M., C.O. Stockle, R. Nelson, and G. Bellocchi. 2003. ET_CSDL: A DLL for the Computation of Reference and Crop Evapotranspiration. *Agronomy Journal*. 95:1334-1336.

Stockle, C.O., M. Donatelli, and R. Nelson. 2003. CropSyst, A Cropping Systems Simulation Model. *European Journal of Agronomy*. 18:289-307.

0371 STUDIES OF USING MICROWAVE AND RADIO FREQUENCY ENERGY IN FOOD SAFETY, PHYTOSANITARY AND QUARANTINE APPLICATIONS

- Buranasompob, A., B.G. Swanson, J. Tang, and R. Mao. 2003. Rancidity of Walnuts and Almonds as Affected by Short-Time Treatments for Insect Control. *Journal of Food Processing and Preservation*. 27:445-464.
- Feng, H., and J. Tang. 2003. Heat and Mass Transfer Modeling in Microwave and Spouted Bed Combined Drying of Particulate Food Products. *Transport Phenomena in Food Processing*. 521-538.
- Guan, D., P. Gray, D.H. Kang, J. Tang, B. Shafer, K. Ito, F. Younce, and C.S. Yang. 2003. Microbiological Validation of Microwave-Circulated Water Combination Heating Technology by Inoculated Pack Studies. *Journal of Food Science*. 68:1428-1432.
- Lau, H., J. Tang, I.A. Taub, T.C.S. Yang, C.G. Edwards, and R. Mao. 2003. Kinetics of Chemical Marker Formation in Whey Protein Gels for Studying High Temperature Short Rime Microwave Sterilization. *Journal of Food Engineering*. 60:397-405.
- Pathak, S., L. Fen, and J. Tang. 2003. Finite Difference Time Domain Simulation of Single-Mode 915 MHz Cavities in Processing Pre-Packaged Foods. *Journal of Microwave Power and Electromagnetic Energy*. 38:37-48.
- Raviyan, P., J. Tang, L. Orellana, and B. Rasco. 2003. Physiochemical Properties of a TTI Based Immobilization of *Aspergillus Oryzae* α -Amylase in Polyacrylamide Gel as Affected by Degree of Cross-Linking Agent and Salt Content. *Journal of Food Science*. 68:2302-2308.
- Raviyan, P., J. Tang, and B. Rasco. 2003. Thermal Stability of α -Amylase from *Aspergillus Oryzae* Entrapped in Polyacrylamide Gel. *Journal of Agricultural and Food Chemistry*. 51:5462-5466.
- Wang, S., J. Tang, R. Cavaliere, and D. Davis. 2003. Differential Heating of Insect Pests in Dried Nuts and Fruits Associated with Radio Frequency and Microwave Treatments. *Transactions of ASAE*. 46:1175-1182.
- Wang, Y., T. Wig, J. Tang, and L.M. Hallberg. 2003. Radio Frequency Sterilization of Packaged Foods. *Journal of Food Science*. 68:539-544.
- 0450 THE SCIENCE AND ENGINEERING FOR A BIOBASED INDUSTRY AND ECONOMY**
- Liu, C., Z. Wen, and S. Chen. 2003. Application of Statistically-Based Experimental Designs for the Optimization of Nisin Production from Whey. *Biotechnology Letters*. 25:877-882.
- 0467 IMPROVEMENT OF THERMAL AND ALTERNATIVE PROCESSES FOR FOOD**
- Bendicho, S., G.V. Barbosa-Canovas, and O. Martin. 2003. Reduction of Protease Activity in Milk with Continuous Flow High Intensity Pulsed Electric Field Treatments. *Journal of Dairy Science*. 86:697-703.
- Espachs-Barroso, A., G.V. Barbosa-Canovas, and O. Martin-Belloso. 2003. Microbial and Enzymatic Changes in Fruit Juice Induced by High-Intensity Pulsed Electric Fields. *Food Reviews International*. 19:253-273.
- Giner, J., V. Gimeno, M. Palomes, G.V. Barbosa-Canovas, and O. Martin. 2003. Lessening Polygalaturonase Activity in a Commercial Enzyme Preparation by Exposure to Pulsed Electric Fields. *European Food Research Technology*. 217:43-48.
- Gongora-Nieto, M.M., P.D. Pedrow, B.G. Swanson, and G.V. Barbosa-Canovas. 2003. Energy Analysis of Liquid Whole Egg Pasteurized by Pulsed Electric Fields. *Journal of Food Engineering*. 57:209-216.

Gongora-Nieto, M.M., P.D. Pedrow, B.G. Swanson, and G.V. Barbosa-Canovas. 2003. Impact of Air Bubbles in a Dielectric Liquid When Subjected to High Field Strengths. *Innovative Food Science and Emerging Technologies*. 4:57-67.

Harte, F., L.O. Luedecke, B.G. Swanson, and G.V. Barbosa-Canovas. 2003. Low-Fat Set Yogurt Made from Milk subjected to Combinations of High Hydrostatic Pressure and Thermal Processing. *Journal of Dairy Science*. 86:1074-1082.

San Martin, M.F., G.V. Barbosa-Canovas, and B.G. Swanson. 2003. Innovations in Food Processing. *Chemical Engineering Progress*. 99:54-60.

Sepulveda, D., G. Olivas, J.J. Rodriguez, H. Warner, S. Clark, and G.V. Barbosa-Canovas. 2003. Storage of Retort Pouch Beefsteak and Beef Stew Packed Under Four Headspace Levels. *Journal of Food Processing and Preservation*. 27:227-242.

0562 RESEARCH AND DEVELOPMENT FOR BIOMASS PROCESSING AND BIOPRODUCT PRODUCTION

Liu, C., Z. Wen, and S. Chen. 2003. Application of Statistically-Based Experimental Designs for the Optimization of Nisin Production from Whey. *Biotechnology Letters*. 25:877-882.

0990 ASSURING FRUIT AND VEGETABLE PRODUCT QUALITY AND SAFETY THROUGH THE HANDLING AND MARKETING CHAIN

Johnson, J.A., S. Wang, and J. Tang. 2003. Thermal Death Kinetics of Fifth-Instar *Plodia interpunctella* (*Lepidoptera: Pyralidae*). *Journal of Economic Entomology*. 96:519-524.

Wang, S., J. Tang, R.P. Cavalieri, and D. Davis. 2003. Differential Heating of Insects in Dried Nuts and Fruits Associated with Radio Frequency and Microwave Treatments. *Transactions of ASAE*. 46:1175-1182.

Wang, S., J. Tang, J.A. Johnson, E. Mitcham, J.D. Hansen, G. Hallman, S.R. Drake, and Y. Wang. 2003. Dielectric Properties of Fruits and Insect Pests as Related to Radio Frequency and Microwave Treatments. *Biosystems Engineering*. 85:201-212.

3227 NON-CHEMICAL PEST CONTROL IN FRUITS AND NUTS USING ELECTROMAGNETIC ENERGY

Johnson, J.A., S. Wang, and J. Tang. 2003. Thermal Death Kinetics of 5th Instar *Plodia interpunctella* (*Lepidoptera: Pyralidae*). *Journal of Economic Entomology*. 96:519-524.

Tang, J., S. Wang, J. Hansen, J. Johnson, E. Mitcham, S. Drake, and G. Hallman. 2003. Postharvest Control of Insect Pests in Nuts and Fruits Based on Radio Frequency Energy. *Acta Horticulturae*. 599:175-181.

Wang S., J. Tang, R. Cavalieri, and D. Davis. 2003. Differential Heating of Insect Pests in Dried Nuts and Fruits associated with Radio Frequency and Microwave Treatments. *Transactions of ASAE*. 46:1175-1182.

Wang, S., J. Tang, J.A. Johnson, E. Mitcham, J.D. Hansen, G. Hallman, S.R. Drake, and Y.F. Wang. 2003. Dielectric Properties of Fruits, Nuts, and Insect Pests as Related to Radio Frequency and Microwave Treatments. *Biosystems Engineering*. 85:201-212.

4378 MICROSTRUCTURES AND PROPERTIES OF HIGH/LOW ACYL MIXED GELLAN GELS

Huang, Y., J. Tang, B. Swanson, and B.A. Rasco. 2003. Effect of Calcium Concentration on Textural Properties of High and Low Acyl Mixed Gellan Gels. *Carbohydrate Polymers*. 54:517-522.

Crop and Soil Sciences:

0175 ADAPTATION STUDIES OF CEREAL VARIETIES AND SELECTIONS

Kidwell, K.K., V.L. DeMacon, G.B. Shelton, J.W. Burns, B.P. Carter, C.F. Morris, X. Chen, and N.A. Bosque-Perez. 2003. Registration of Macon Wheat. *Crop Science*. 43:1561-1563.

Ullrich, S.E., V.A. Jitkov, C.E. Muir, J.W. Burns, P.E. Reisenauer, R.F. Line, X. Chen, B.L. Jones, D.M. Wesenberg, L.D. Robertson, and P.M. Hayes. 2003. Registration of Bob Barley. *Crop Science*. 43:1132-1134.

0182 TOTAL SOIL CARBON AND CARBON FRACTIONS UNDER DIFFERENT CROPPING AND TILLAGE PRACTICES IN THE PACIFIC NORTHWEST.

Bezdicsek, D.F., T. Beaver, and D. Granatstein. 2003. Subsoil Ridge Tillage and Lime Effects on Soil Microbial Activity, Soil pH, Erosion, and Wheat and Pea Yield in the Pacific Northwest USA. *Soil and Tillage Research*. 74:55-63.

Fuentes, J.P., M. Flury, D.R. Huggins, and D.F. Bezdicsek. 2003. Soil Water and Nitrogen Dynamics in Dryland Cropping Systems of Washington State. *Soil and Tillage Research*. 71 33-47.

0196 MOLECULAR MARKERS FOR BARLEY DISEASE RESISTANCE GENES IN BARLEY

Druka A., D. Kudrna, N. Rostoks, R. Brueggeman, D. von Wettstein, and A. Kleinhofs. 2003. Chalcone Isomerase Gene from Barley (*Hordeum vulgare*) and Rice (*Oryza sativa*): Physical, Genetic, and Mutant Mapping. *Gene*. 302:171-178.

Rostoks, N., D. Schmierer, D. Kudrna, and A. Kleinhofs. 2003. Barley Putative Hypersensitive Induced Reaction Genes: Genetic Mapping, Sequence Analyses, and Differential Expression Disease Lesion Mimic Mutants. *Theoretical and Applied Genetics*. 107:1094-1101

0250 CROPPING SYSTEMS RESEARCH FOR LOW-PRECIPITATION DRYLAND IN EASTERN WASHINGTON

Giri, G.S., and W.F. Schillinger. 2003. Seed Priming Winter Wheat for Germination, Emergence, and Yield. *Crop Science*. 43:2135-2141.

0251 BREEDING OF VALUE-ADDED BARLEY BY INCORPORATION OF PROTEIN-ENGINEERED BETA-GLUCANASES

von Wettstein, D., J. Warner, and C.G. Kannangara. 2003. Supplements of Transgenic Malt or Grain Containing (1,3-1,4)- α -Glucanase to Barley Based Broiler Diets Lift Their Nutritive Value to that of Corn. *British Journal of Poultry Science*. 44:438-449.

0267 FLOW AND TRANSPORT IN POROUS MEDIA AT DIFFERENT SPATIAL SCALES

Cherrey, K.D., M. Flury, and J.B. Harsh. 2003. Nitrate and Colloid Transport through Coarse Hanford Sediments Under Steady-State, Variably-Saturated Flow. *Water Resource Research*. 39:1165.

Zhuang, J., M. Flury, and Y. Jin. 2003. Colloid-Facilitated Cs Transport through Water-Saturated Hanford Sediment and Ottawa Sand. *Environmental Science Technology*. 37:4905-4911.

0323 REMOTE SENSING FOR LAND MANAGEMENT

Johnson, D.A., J.R. Alldredge, P.B. Hamm, and B.E. Frazier. 2003. Aerial Photography used for Spatial Pattern Analysis of Late Blight Infection in Irrigated Potato Circles. The American Phytopathological Society. 93:7:805-812.

0332 EVALUATION AND MANAGEMENT OF TURFGRASS SPECIES AND CULTIVARS

Cook, T., and B. Johnston. 2003. Colonial and Highland Bentgrass (*Agrostis sp.*). Turfgrass Management in the Pacific Northwest. 5:32-36.

Cook, T., W.J. Johnston, E.D. Miltner, and G.K. Stahnke. 2003. Creeping Bentgrass in the Pacific Northwest (*Agrostis stolonifera L.*). Turfgrass Management in the Pacific Northwest. 6:33-35,39.

Johnson, R.C., W.J. Johnston, and C.T. Golob. 2003. Residue Management, Seed Production, Crop Development, and Turf Quality in Diverse Kentucky Bluegrass Germplasm. Crop Science. 43:1091-1099.

Johnston, W.J., C.T. Golob, and E.D. Miltner. 2003. Nitrogen Leaching from a Sand-Based Green. Golf Course Management. 71:100-103.

Johnston, W.J., and C.T. Golob. 2003. Measuring Nitrogen Loss from a Floating Green. USGA Green Section Record. 41:23-25.

0334 IMPROVING SPRING WHEAT VARIETIES FOR THE PACIFIC NORTHWEST

Kidwell, K.K., V.L. DeMacon, G.B. Shelton, J.W. Burns, B.P. Carter, C.F. Morris, X. Chen, and N.A. Bosque-Perez. 2003. Registration of Macon Wheat. Crop Science. 43:1561-1563

Paulitz, T.C., J.D. Smith, and K.K. Kidwell. 2003. Virulence of *Rhizoctonia oryzae* on Wheat and Barley Cultivars from the Pacific Northwest. Plant Disease. 87:51-55.

Smith, J.D., K.K. Kidwell, M.A. Evans, R.J. Cook, and R.W. Smiley. 2003. Evaluation of Spring Cereal Grains and Wild Triticum Relatives for Disease Reaction to *Rhizoctonia Solani* AG-8 in Controlled Environments. Crop Science. 43:701-709.

Smith, J.D., K.K. Kidwell, M.A. Evans, R.J. Cook, and R.W. Smiley. 2003. Assessment of Spring Wheat Accessions for Disease Reaction to *Rhizoctonia Solani* AG-8 in Controlled Environment and No-Till Field Evaluations. Crop Science. 43:694-700.

0353 SOIL QUALITY CHANGES WITH NO-TILL MANAGEMENT ADOPTION FOR WIND EROSION CONTROL

Acosta-Martinez, V., T.M. Zobeck, T.E. Gill, and A.C. Kennedy. 2003. Enzyme Activities and Microbial Community Structure in Semiarid Agricultural Soils. Biology and Fertility of Soils. 38:216-227.

Dierksen, K.P., G.W. Whittaker, G.M. Banowetz, M.A. Azevedo, A.C. Kennedy, J.J. Steiner, and S.M. Griffith. 2003. High Resolution Characterization of Soil Biological Communities by Nucleic and Fatty Acid Analyses. Soil Biology and Biochemistry. 34:1853-1860.

0359 EARLY GENERATION AND MARKET SPECIFIC QUALITY EVALUATION OF NEW WHEAT VARIETIES

Kidwell, K.K., V.L. DeMacon, G.B. Shelton, J.W. Burns, B.P. Carter, C.F. Morris, X. Chen, and N.A. Bosque-Perez. 2003. Registration of 'Macon' Wheat. Crop Science. 43:1531-1563.

0373 CARBON AND NITROGEN CYCLING AND MANAGEMENT IN ALTERNATIVE CROPPING SYSTEMS

Thorne, M.E., F.L. Young, W.L. Pan, R. Bafus, and J.R. Alldredge. 2003. No-Till Spring Cereal Cropping Systems Reduce Wind Erosion Potential in the Wheat/Fallow Region of the PNW. *Journal of Soil and Water Conservation*. 58: 250-257.

0376 INTEGRATED MANAGEMENT OF WINTER ANNUAL GRASS WEEDS IN EASTERN WASHINGTON DRYLAND CROP SYSTEMS

Ball, D.A., J.P. Yenish, and T. Alby III. 2003. Effect of Imazamox Soil Persistence on Dryland Rotational Crops. *Weed Technology*. 17:161-165.

Young, F.L., J.P. Yenish, D.L. Walenta, and D.A. Ball. 2003. Spring-Germinating Jointed Goatgrass Produces Viable Spikelets in Spring Seeded Wheat. *Weed Science*. 51:379-385.

0382 PM10 PARTICULATE EMISSION PREDICTION AND CONTROL FROM AGRICULTURAL LANDS IN THE PACIFIC NORTHWEST

Acosta-Martinez, V., T.M. Zobeck, T.E. Gill, and A.C. Kennedy. 2003. Enzyme Activities and Microbial Community Structure in Semiarid Agricultural Soils. *Biology and Fertility of Soils*. 38:216-227.

Baker, D.A., D.L. Young, D.R. Huggins, and W.L. Pan. 2003. Economically Optimal Nitrogen Fertilization for Yield and Protein in Hard Red Spring Wheat. *Agronomy Journal*. 96:116-123

Clement, S.L., L.R. Elberson, F.L. Young, J.R. Alldredge, R.H. Ratcliffe, and C. Hennings. 2003. Variable Hessian Fly (*Diptera: Cecidomyiidae*) Populations in Cereal Production Systems in Eastern Washington. *Journal of the Kansas Entomological Society*. 76:567-577.

Dierksen, K.P., G.W. Whittaker, G.M. Banowetz, M.A. Azevedo, A.C. Kennedy, J.J. Steiner, and S.M. Griffith. 2003. High Resolution Characterization of Soil Biological Communities by Nucleic and Fatty Acid Analyses. *Soil Biology and Biochemistry*. 34:1853-1860.

Giri, G.S., and W.F. Schillinger. 2003. Seed Priming Winter Wheat for Germination, Emergence, and Yield. *Crop Science*. 43:2135-2141.

Thorne, M.E., F.L. Young, W.L. Pan, R. Bafus, and J.R. Alldredge. 2003. No-Till Spring Cereal Cropping Systems Reduce Wind Erosion Susceptibility in the Wheat/Fallow Region of the Pacific Northwest. *Journal of Soil and Water Conservation*. 58:250-257.

Upadhayay, B.M., D.L. Young, H.H. Wang, and P.R. Wandschneider. 2003. How do Farmers Who Adopt Multiple Conservation Practices Differ from Their Neighbors? *American Journal of Alternative Agriculture*. 18:27-36.

0421 PM-10 PARTICULATE EMISSION PREDICTION AND CONTROL FROM AGRICULTURAL LANDS IN THE PACIFIC NORTHWEST COLUMBIA PLATEAU

Acosta-Martinez, V., T.M. Zobeck, T.E. Gill, and A.C. Kennedy. 2003. Enzyme Activities and Microbial Community Structure in Semiarid Agricultural Soils. *Biology and Fertility of Soils*. 38:216-227.

Baker, D.A., D.L. Young, D.R. Huggins, and W.L. Pan. 2003. Economically Optimal Nitrogen Fertilization for Yield and Protein in Hard Red Spring Wheat. *Agronomy Journal*. 96:116-123.

Clement, S.L., L.R. Elberson, F.L. Young, J.R. Alldredge, R.H. Ratcliffe, and C. Hennings. 2003. Variable Hessian Fly (*Diptera: Cecidomyiidae*) Populations in Cereal Production Systems in Eastern Washington. *Journal of the Kansas Entomological Society*. 76:567-577.

Dierksen, K.P., G.W. Whittaker, G.M. Banowetz, M.A. Azevedo, A.C. Kennedy, J.J. Steiner, and S.M. Griffith. 2003. High Resolution Characterization of Soil Biological Communities by Nucleic and Fatty Acid Analyses. *Soil Biology and Biochemistry*. 34:1853-1860.

Giri, G.S., and W.F. Schillinger. 2003. Seed Priming Winter Wheat for Germination, Emergence, and Yield. *Crop Science*. 43:2135-2141.

Smith, E.G., and D.L. Young. 2003. Cropping Diversity along the U.S.-Canada border. *Review of Agricultural Economics*. Spring/Summer: 154-167.

Thorne, M.E., F.L. Young, W.L. Pan, R. Bafus, and J.R. Alldredge. 2003. No-Till Spring Cereal Cropping Systems Reduce Wind Erosion Susceptibility in the Wheat/Fallow Region of the Pacific Northwest. *Journal of Soil and Water Conservation*. 58:250-257.

Upadhayay, B.M., D.L. Young, H.H. Wang, and P.R. Wandschneider. 2003. How do Farmers Who Adopt Multiple Conservation Practices Differ from Their Neighbors? *American Journal of Alternative Agriculture*. 18:27-36.

0552 PM-10 PARTICULATE EMISSION PREDICTION AND CONTROL FROM AGRICULTURAL LANDS IN THE PACIFIC NORTHWEST

Acosta-Martinez, V., T.M. Zobeck, T.E. Gill, and A.C. Kennedy. 2003. Enzyme Activities and Microbial Community Structure in Semiarid Agricultural Soils. *Biology and Fertility of Soils*. 38:216-227.

Clement, S.L., L.R. Elberson, F.L. Young, J.R. Alldredge, R.H. Ratcliffe, and C. Hennings. 2003. Variable Hessian Fly (*Diptera: Cecidomyiidae*) Populations in Cereal Production Systems in Eastern Washington. *Journal of the Kansas Entomological Society*. 76:567-577.

Dierksen, K.P., G.W. Whittaker, G.M. Banowetz, M.A. Azevedo, A.C. Kennedy, J.J. Steiner, and S.M. Griffith. 2003. High Resolution Characterization of Soil Biological Communities by Nucleic and Fatty Acid Analyses. *Soil Biology and Biochemistry*. 34:1853-1860.

Giri, G.S., and W.F. Schillinger. 2003. Seed Priming Winter Wheat for Germination, Emergence, and Yield. *Crop Science*. 43:2135-2141.

Smith, E.G., and D.L. Young. 2003. Cropping Diversity Along the U.S.-Canada Border. *Review of Agricultural Economics*. Spring/Summer: 154-167.

Thorne, M.E., F.L. Young, W.L. Pan, R. Bafus, and J.R. Alldredge. 2003. No-Till Spring Cereal Cropping Systems Reduce Wind Erosion Susceptibility in the Wheat/Fallow Region of the Pacific Northwest. *Journal of Soil and Water Conservation*. 58:250-257.

Upadhayay, B.M., D.L. Young, H.H. Wang, and P.R. Wandschneider. 2003. How do Farmers Who Adopt Multiple Conservation Practices Differ from Their Neighbors? *American Journal of Alternative Agriculture*. 18:27-36.

0722 ORGANIC AMENDMENTS AND COVER CROPS IN SUSTAINABLE AGRICULTURAL SYSTEMS

Gilmour, J.T., C.G. Cogger, L.W. Jacobs, G.K. Evanylo, and D.M. Sullivan. 2003. Decomposition and Plant Available N in Biosolids: Laboratory Studies, Field Studies, and Computer Simulation. *Journal of Environmental Quality*. 32:1498-1507.

Miltner, E., A. Bary, and C. Cogger. 2003. Clopyralid and Compost: Formulation and Mowing Effects on Herbicide Content of Grass Clippings. *Compost Science and Utilization*. 11:289-299.

Sullivan, D.M., A.I. Bary, T.J. Narrea, E.A. Myrhe, C.G. Cogger, and S.C. Fransen. 2003. Nitrogen Availability Seven Years after a High-Rate Food Waste Compost Application. *Compost Science*. 11:265-275.

1006 BREEDING AND GENETICS OF BARLEY

Clancy, J.A., F. Han, and S.E. Ullrich. 2003. Comparative Mapping of Beta-Amylase Activity QTLs Among Three Barley Crosses. *Crop Science*. 43:1043-1052.

Gao, W., J.A. Clancy, F. Han, D. Prada, A. Kleinhofs, and S.E. Ullrich. 2003. Molecular Dissection of a Dormancy QTL Region Near the Chromosome 7 (5H) L Telomere in Barley. *Theoretical and Applied Genetics*. 107:552-559.

Han, F., S.E. Ullrich, I Romagosa, J.A. Clancy, J.A. Froseth, and D.M. Wesenberg. 2003. Quantitative Genetic Analysis of Acid Detergent Fiber Content in Barley Grain. *Journal of Cereal Science*. 38:167-172.

6197 MOLECULAR GENETICS OF THE BARLEY STEM RUST RESISTANCE GENE FAMILIES

Druka, A., D. Kudrna, N. Rostoks, R. Brueggeman, D. von Wettstein, and A. Kleinhofs. 2003. Chalcone Isomerase Gene from Barley (*Hordeum vulgare*) and Rice (*Oryza sativa*): Physical, Genetic, and Mutant Mapping. *Gene*. 302:171-178

7198 CLONING AND CHARACTERIZATION OF THE BARLEY STEM RUST RESISTANCE GENES RPG4 AND RPGQ

Castro, A.J., F. Capettini, A.E. Corey, T. Filichkina, P.M. Hayes, A. Kleinhofs, D. Kudrna, K. Richardson, S. Sandoval-Islas, C. Rossi, H. Vivar. 2003. Mapping and Pyramiding of Qualitative and Quantitative Resistance to Stripe Rust in Barley. *Theoretical and Applied Genetics*. 107:922-930

Rostoks, N., D. Schmierer, D. Kudrna, and A. Kleinhofs. 2003. Barley Putative Hypersensitive Induced Reaction Genes: Genetic Mapping, Sequence Analyses, and Differential Expression Disease Lesion Mimic Mutants. *Theoretical and Applied Genetics*. 107:1094-1101

Entomology:

0405 POTENTIAL OF INSECT GROWTH REGULATORS FOR CONTROLLING INSECT PESTS OF THE PACIFIC NORTHWEST

Horton, D.R., D.A. Broers, R.R. Lewis, D. Granatstein, R.S. Zack, T.R. Unruh, A.R. Moldenke, and J.J. Brown. 2003. Effects of Mowing Frequency on Densities of Natural Enemies in Three Pacific Northwest Pear Orchards. *Entomologia Experimentalis et Applicata*. 106:135-145.

Pszczolkowski, M.A., and J.J. Brown. 2003. Effects of Sugars and Non-Nutritive Sugar Substitutes on Consumption of Apple Leaves by Neonates of Codling Moth. *Phytoparasitica*. 31:283-291.

Pszczolkowski, M.A., and J.J. Brown. 2003. Chilling Affects Allatal Cell Proliferation via Antennae and Protocerebral Neurons in the Cockroach *Diploptera punctata*. *Journal of Insect Physiology*. 49:123-129.

Pszczolkowski, M., A. Zahand, S.M. Bushman, and J.J. Brown. 2003. Effects of Calcium and Glutamate Receptor Antagonists on Leaf Consumption by Lepidopteran Neonates. *Pharmacology, Biochemistry, and Behavior*. 74:389-394.

0415 UTILIZING COMPLEX COMMUNITIES OF NATURAL ENEMIES IN BIOCONTROL

Snyder, W.E., and A.R. Ives. 2003. Interactions between Specialist and Generalist Natural Enemies: Parasitoids, Predators, and Pea Aphid Biocontrol. *Ecology*. 84:91-107.

Food and Environmental Quality Lab:

0372 MECHANISMS AND MITIGATION OF AGROCHEMICAL IMPACTS ON HUMAN AND ENVIRONMENTAL HEALTH

Tomaszewska, E., and V.R. Hebert. 2003. Method for the Determination of O,S-dimethyl thiophosphate in Urine. *Journal of Agricultural and Food Chemistry*. 51:6103-6109.

0470 REDUCING THE POTENTIAL FOR ENVIRONMENTAL CONTAMINATION BY PESTICIDES AND OTHER ORGANIC CHEMICALS

Hamilton, D.J., A. Ambrus, R.M. Dieterle, A.S. Felsot, C.A. Harris, P.T. Holland, A. Katayama, N. Kurihara, J. Linders, J. Unsworth, and S.-S. Wong. 2003. Regulatory Limits for Pesticide Residues in Water. *Pure and Applied Chemistry*. 75:1123-1155.

Food Science and Human Nutrition:

0128 MANAGEMENT OF GRAIN QUALITY AND SECURITY FOR WORLD MARKETS

Baik, B.-K., and M.-R., Lee. 2003. Effects of Starch Amylose Content of Wheat on Textural Properties of White Salted Noodles. *Cereal Chemistry*. 80:304-309.

Baik, B.-K., C.S. Park, B. Paszczynska, and C.F. Konzak. 2003. Characteristics of Noodles and Bread Prepared from Double Null Partial Waxy Wheat. *Cereal Chemistry*. 80:627-633.

Park, C.S., B.H. Hong, and B.-K. Baik. 2003. Protein Quality of Wheat Required for Making White Salted Noodles and its Influence on Processing and Texture of Noodles. *Cereal Chemistry*. 80:297-303.

0208 ECOLOGICAL AND VITICULTURAL PRACTICES ON FERMENTATION, MICROBIOLOGY, CHEMISTRY, AND QUALITY OF WINES

Edwards, C.G. and L. Petersen. 2003. Controlling Malolactic Fermentation. *Vinarsky Obzor (Czech Republic)*. 96:409-410.

Larsen, J.T., J.C. Nielsen, B. Kramp, M. Richelieu, M.J. Riisager, N. Arneborg, and C.G. Edwards. 2003. The Inhibitory Effect of *Saccharomyces cerevisiae* on Malolactic Fermentation by *Oenococcus oeni*. *American Journal for Enology and Viticulture*. 54:246-251.

Lu, G., C.G. Edwards, J.K. Fellman, D.S. Mattinson, and J. Navazio. 2003. Biosynthetic Origin of Geosmin in Red Beets (*Beta vulgaris* L.). *Journal of Agricultural and Food Chemistry*. 51: 1026-1029.

Lu, G., J.K. Fellman, C.G. Edwards, D.S. Mattinson, and J. Navazio. 2003. Quantitative Determination of Geosmin in Red Beets (*Beta vulgaris* L.) Using Headspace Solid-Phase Microextraction. *Journal of Agricultural and Food Chemistry*. 51:1021-1025.

Wang, X.D., J.C. Bohlscheid, and C.G. Edwards. 2003. Fermentative Activity and Production of Volatile Compounds by *Saccharomyces* Grown in Synthetic Grape Juice Media Deficient in Assimilable Nitrogen and/or Pantothenic Acid. *Journal of Applied Microbiology*. 94:1-11

0288 MICROBIAL AND CHEMICAL FACTORS AFFECTING CALCIUM LACTATE CRYSTAL FORMATION IN CHEDDAR CHEESE

Chou, Y.-E., C.G. Edwards, L.O. Luedecke, M.P. Bates and S. Clark. 2003. Nonstarter Lactic Acid Bacteria and Aging Temperature Affect Calcium Lactate Crystallization in Cheddar Cheese. *Journal of Dairy Science*. 86:2516-2524.

0305 APPLICATIONS OF SPECTROSCOPIC METHODS TO IMPROVE FOOD QUALITY AND SAFETY OF HIGH VALUE AQUATIC FOOD PRODUCTS

Huang, Y., A.G. Cavinato, D.M. Mayes, L.L. Kangas, G.E. Bledsoe, and B.A. Rasco. 2003. Non-Destructive Prediction of Moisture and Sodium Chloride in Cured Atlantic Salmon (*Salmo salar*) Teijin by Short Wavelength near Infrared Spectroscopy (SWNIR). *Journal of Food Science*. 68:482-486.

Huang, Y., J. Tang, B. Swanson, A.G. Cavinato, M. Lin, and B.A. Rasco. 2003. Near Infrared Spectroscopy: a New Tool for Studying Physical and Chemical Properties of Polysaccharide Gels. *Carbohydrate Polymers*. 54:281-288.

Huang, Y., J. Tang, B. Swanson, and B.A. Rasco. 2003. Effect of Calcium Concentration on Textural Properties of High and Low Acyl Mixed Gellan Gels. *Carbohydrate Polymers*. 54:517-522.

0331 DIETARY ASTAXANTHIN IN INFLAMMATORY DISEASE: A RHEUMATOID ARTHRITIS MODEL IN DOGS AND CATS

Chew, B.P., C.M. Brown, J.S. Park, and P.F. Mixer. 2003. Dietary Lutein Inhibits Mouse Mammary Tumor Growth by Regulating Angiogenesis and Apoptosis. *Anticancer Research*. 23:3333-3339.

0369 EVALUATION OF SURFACE IRRIGATION WATER AS SOURCE OF CONTAMINATION OF FRUITS AND VEGETABLES WITH E. COLI O157 AND L. MONOCYTOGENES.

Kang, D.H., M.S. Rhee, and M. Costello. 2003. Development of a Miniaturized 4-Culture Method for the Rapid Enumeration of Four Bacterial Groups in Ground Beef. *Letters in Applied Microbiology*. 36:197-202.

Rhee, M.S., S.Y. Lee, V. Hillers, S. McCurdy, and D.H. Kang. 2003. Evaluation of Consumer-Style Cooking Methods for Reduction of *Escherichia coli* O157:H7 in Hamburger. *Journal of Food Protection*. 66:1030-1034.

Chang, S.S., and D.H. Kang. 2003. Rapid Coliform Monitoring Method Using Gas/Color Production in Alginate System. *Journal of Food Protection*. 66:2146-2150.

0395 REDUCING RISK WITH FOOD THERMOMETERS: STRATEGIES FOR BEHAVIOR CHANGE

Rhee, M.S., S.Y. Lee, V. Hillers, S. McCurdy, and D.H. Kang. 2003. Evaluation of Consumer-Style Cooking Methods for Reduction of *Escherichia coli* O157:H7 in Hamburger. *Journal of Food Protection*. 66:1030-1034.

0522 MICROBIOLOGY AND CHEMISTRY OF WASHINGTON WINES

Edwards, C.G., and L. Petersen. 2003. Controlling Malolactic Fermentation. *Vinarsky Obzor (Czech Republic)*. 96:409-410.

Larsen, J.T., J.C. Nielsen, B. Kramp, M. Richelieu, M.J. Riisager, N. Arneborg, and C.G. Edwards. 2003. The Inhibitory Effect of *Saccharomyces Cerevisiae* on Malolactic Fermentation by *Oenococcus oeni*. *American Journal for Enology and Viticulture*. 54:246-251.

Lu, G., C.G. Edwards, J.K. Fellman, D.S. Mattinson, and J. Navazio. 2003. Biosynthetic Origin of Geosmin in Red Beets (*Beta vulgaris L.*). *Journal of Agricultural and Food Chemistry*. 51:1026-1029.

Lu, G., J.K. Fellman, C.G. Edwards, D.S. Mattinson, and J. Navazio. 2003. Quantitative Determination of Geosmin in Red Beets (*Beta vulgaris L.*) Using Headspace Solid-Phase Microextraction. *Journal of Agricultural and Food Chemistry*. 51:1021-1025.

Wang, X.D., J.C. Bohlscheid, and C.G. Edwards. 2003. Fermentative Activity and Production of Volatile Compounds by *Saccharomyces* Grown in Synthetic Grape Juice Media Deficient in Assimilable Nitrogen and/or Pantothenic Acid. *Journal of Applied Microbiology*. 94:1-11.

0846 ENOLOGICAL AND VITICULTURAL PRACTICES ON FERMENTATION, MICROBIOLOGY, CHEMISTRY, AND QUALITY OF WINES

Edwards, C.G., and L. Petersen. 2003. Controlling Malolactic Fermentation. *Vinarsky Obzor (Czech Republic)*. 96:409-410.

Larsen, J.T., J.C. Nielsen, B. Kramp, M. Richelieu, M.J. Riisager, N. Arneborg, and C.G. Edwards. 2003. The Inhibitory Effect of *Saccharomyces cerevisiae* on Malolactic Fermentation by *Oenococcus oeni*. *American Journal for Enology and Viticulture*. 54:246-251.

Lu, G., C.G. Edwards, J.K. Fellman, D.S. Mattinson, and J. Navazio. 2003. Biosynthetic Origin of Geosmin in Red Beets (*Beta vulgaris L.*). *Journal of Agricultural and Food Chemistry*. 51:1026-1029.

Lu, G., J.K. Fellman, C.G. Edwards, D.S. Mattinson, and J. Navazio. 2003. Quantitative Determination of Geosmin in Red Beets (*Beta vulgaris L.*) Using Headspace Solid-Phase Microextraction. *Journal of Agricultural and Food Chemistry*. 51:1021-1025.

Wang, X.D., J.C. Bohlscheid, and C.G. Edwards. 2003. Fermentative Activity and Production of Volatile Compounds by *Saccharomyces* Grown in Synthetic Grape Juice Media Deficient in Assimilable Nitrogen and/or Pantothenic Acid. *Journal of Applied Microbiology*. 94:1-11.

0905 NUTRIENT BIOAVAILABILITY-PHYTONUTRIENTS AND BEYOND

Shahin, A.M., M.K. McGuire, M.A. McGuire, K.L. Ritzenthaler, and T.D. Shultz. 2003. Determination of Conjugated Linoleic Acid (CLA) in Human Plasma Lipid Classes Using a Combination of Methylating Methodologies. *Lipids*. 38:793-800.

3468 SURFACE HYDROPHOBICITY AND FUNCTIONALITY OF PROTEINS IN THE MOLTEN GLOBULE STATE

Yang, J., A.K. Dunker, J.R. Powers, S. Clark, and B.G. Swanson. 2003. Ligand and Flavor Binding Functional Properties of Beta-Lactoglobulin in the Molten Globule State Induced by High Pressure. *Journal of Food Science*. 68:444-452.

3505 ENGINEERED ENZYME-BASED TIME TEMPERATURE INDICATORS (TTIS) FOR VALIDATING FOOD PASTEURIZATION PROCESSES

Raviyan, P., J. Tang, L. Orellana, and B. Rasco. 2003. Physicochemical Properties of a TTI Based Immobilization of *Aspergillus oryzae* α -Amylase in Polyacrylamide Gel as Affected by Degree of Cross-Linking Agent and Salt Content. *Journal of Food Science*. 68:2302-2308.

Raviyan, P., J. Tang, and B. Rasco. 2003. Thermal Stability of α -Amylase from *Aspergillus oryzae* entrapped in Polyacrylamide Gel. *Journal of Agricultural and Food Chemistry*. 51:5462-5466.

6305 NON-INVASIVE METHOD FOR PREDICTING SAFETY AND QUALITY OF FOODS

Huang, Y., A.G. Cavinato, D.M. Mayes, L.L. Kangas, G.E. Bledsoe, and B.A. Rasco. 2003. Non-Destructive Prediction of Moisture and Sodium Chloride in Cured Atlantic Salmon (*Salmo salar*) Teijin by Short Wavelength near Infrared Spectroscopy (SWNIR). *Journal of Food Science*. 68:482-486.

Horticulture and Landscape Architecture:

0321 CALCIUM/CALMODULIN-MEDIATED TRANSCRIPTIONAL NETWORKS IN PLANTS

Yang, T., and B.W. Poovaiah. 2003. Calcium/Calmodulin-Mediated Signal Network in Plants. *Trends. Plant Science*. 8:505-512.

0346 PHYSIOLOGICAL AND BIOCHEMICAL MARKERS OF POTATO SEED-TUBER AGE AND PRODUCTIVITY

Al-Saad, K.A., V. Zabrouskov, W.F. Siems, N.R. Knowles, and H.H. Hill Jr. 2003. Structural Analysis of Phosphatidylcholine by Post-Source Decay Matrix-Assisted Laser Desorption/Ionization Time-of-Flight Mass Spectrometry. *Journal American Society of Mass Spectrometry*. 14:373-382.

Al-Saad, K.A., V. Zabrouskov, W.F. Siems, N.R. Knowles, R.M. Hannan, and H.H. Hill Jr. 2003. Matrix-Assisted Laser Desorption Ionization Time-of-Flight Mass Spectrometry of Lipids: Ionization and Prompt Fragmentation Patterns. *Rapid Communications in Mass Spectrometry*. 17:87-96.

Knowles, N.R., L.O. Knowles, and G.N.M. Kumar. 2003. Stem Number and Tuber Set Relationships for Russet Burbank, Ranger, and Umatilla Russet Potatoes in the Columbia Basin. *Potato Progress*. 3:1-4.

Kumar, G.N.M., and N.R. Knowles. 2003. Wound-Induced Superoxide Production and PAL Activity Decline with Potato Tuber Age and Wound Healing Ability. *Physiologia Plantarum*. 117:108-117.

0461 PHYSIOLOGICAL AND BIOCHEMICAL MARKERS OF POTATO SEED-TUBER AGE AND PRODUCTIVITY

Al-Saad, K.A., V. Zabrouskov, W.F. Siems, N.R. Knowles, and H.H. Hill Jr. 2003. Structural Analysis of Phosphatidylcholine by Post-Source Decay Matrix-Assisted Laser Desorption/Ionization Time-of-Flight Mass Spectrometry. *Journal American Society of Mass Spectrometry*. 14:373-382.

Al-Saad, K.A., V. Zabrouskov, W.F. Siems, N.R. Knowles, R.M. Hannan, and H.H. Hill Jr. 2003. Matrix-Assisted Laser Desorption Ionization Time-of-Flight Mass Spectrometry of Lipids: Ionization and Prompt Fragmentation Patterns. *Rapid Communications in Mass Spectrometry*. 17:87-96.

Knowles, N.R., L.O. Knowles, and G.N.M. Kumar. 2003. Stem Number and Tuber Set Relationships for Russet Burbank, Ranger, and Umatilla Russet Potatoes in the Columbia Basin. *Potato Progress*. 3:1-4.

Kumar, G.N.M., and N.R. Knowles. 2003. Wound-Induced Superoxide Production and PAL Activity Decline with Potato Tuber Age and Wound Healing Ability. *Physiologia Plantarum*. 117:108-117.

0695 THE IMPACTS OF PLANTS ON PEOPLE

Relf, P.D., and V.I. Lohr. 2003. Human Issues in Horticulture. *HortScience*. 38:984-993.

0797 POSTHARVEST BIOLOGY OF FRUIT

Fellman, J.K., D.R. Rudell, D.S. Mattinson, and J.P. Mattheis. 2003. Relationship of Harvest Maturity to Flavor Regeneration after CA Storage of "Delicious" Apples. *Postharvest Biology Technology*. 27:39-51.

Haines, M.M., P.J. Shiel, J.K. Fellman, and P.H. Berger. 2003. Abnormalities in Growth, Development and Physiological Responses to Biotic and Abiotic Stress in Potato (*Solanum tuberosum*) Transformed with Arabidopsis ETR1. *Journal of Agricultural Science*. 141:1-15.

Lu, G., C.G. Edwards, J.K. Fellman, D.S. Mattinson, and J. Navazio. 2003. Biosynthetic Origin of Geosmin in Red Beets (*Beta vulgaris L.*). *Journal of Agricultural and Food Chemistry*. 51:1026-1029.

Lu, G., J.K. Fellman, C.G. Edwards, D.S. Mattinson, and J. Navazio. 2003. Quantitative Determination of Geosmin in Red Beets (*Beta vulgaris L.*) Using Headspace Solid-Phase Microextraction. *Journal of Agricultural and Food Chemistry*. 51:1021-1025.

Warren, J.M., J.H. Bassman, J.K. Fellman, S.D. Eigenbrode, and D.S. Mattinson. 2003. Ultraviolet-B Radiation Alters Phenolic Salicylate and Flavonoid Composition of *Populus trichocarpa* Leaves. *Tree Physiology*. 23:527-535.

0937 ROLE OF ENVIRONMENTAL STRESSES AND PRODUCTION SYSTEMS ON FRUIT BIOLOGY AND QUALITY

Chong, S.T., and P.K. Andrews. 2003. The Relationship of Dwarfing and Root Anatomy in Sweet Cherry (*Prunus avium L.*) Rootstocks. *Journal of Tropical Agriculture and Food Science*. 31:19-24.

3324 FUNCTIONAL ANALYSIS OF CALCIUM/CALMODULIN-REGULATED ATSR FAMILY INVOLVED IN PLANT STRESS RESPONSE

Yang, T., and B.W. Poovaiah. 2003. Calcium/Calmodulin-Mediated Signal Network in Plants. *Trends in Plant Science*. 8:505-512.

IMPACT Center:

0171 INTERNATIONAL MARKETING PROGRAM FOR AGRICULTURAL COMMODITIES AND TRADE

0451 ENHANCING COMPETITIVENESS OF AGRICULTURAL PRODUCTS

0541 INTERNATIONAL MARKETING PROGRAM FOR AGRICULTURAL COMMODITIES AND TRADE (IMPACT) CENTER

5901 ENHANCING COMPETITIVENESS OF AGRICULTURAL PRODUCTS

6901 ENHANCING COMPETITIVENESS OF AGRICULTURAL PRODUCTS

Baik, B.-K., and M.-R. Lee. 2003. Effects of Starch Amylose Content of Wheat on Textural Properties of White Salted Noodles. *Cereal Chemistry*. 80:304-309.

Baik, B.-K., C.S. Park, B. Paszczynska, and C.F. Konzak, 2003. Characteristics of Noodles and Bread Prepared from Double Null Partial Waxy Wheat. *Cereal Chemistry*. 80:627-633.

Bledsoe, G.E., and B.A. Rasco. 2003. Effective Food Security Plans for Production Agriculture and Food Processing. *Food Protection Trends*. Feb.: 130-141.

- Bledsoe, G.E., C.D. Bledsoe, and B.A. Rasco. 2003. Caviar and Fish Roe Products. *Critical Reviews in Food Science and Nutrition*. 43:233-271.
- Curtis, K.R., Q. Li, J.J. McCluskey, and T.I. Wahl. 2003. Is China the Market for GM Potato Products? *AgBioForum*. 5:175-178.
- Dalgetty, D.D., and B.-K. Baik. 2003. Isolation and Characterization of Cotyledon Fibers from Peas, Lentils, and Chickpeas. *Cereal Chemistry*. 80:310-315.
- Felloni, F., J. Gilbert, T. Wahl, and P. Wandschneider. 2003. Trade Policy, Biotechnology, and Grain Self-Sufficiency in China. *Agricultural Economy*. 28:173-186.
- Gilbert, J., and T. Wahl. 2003. Labor Market Distortions and China's WTO Accession Package: An Applied General Equilibrium Assessment. *Journal of Comparative Economics*. 31:774-794.
- Johnson J.A., S. Wang, and J. Tang. 2003. Thermal Death Kinetics of Fifth-Instar *Plodia interpunctella* (Lepidoptera: Pyralidae). *Journal of Economic Entomology*. 96:519-524.
- Kang, D.H., M.S. Rhee, and M. Costello. 2003. Development of a Miniaturized 4-Culture Method for the Rapid Enumeration of Four Bacterial Groups in Ground Beef. *Letters in Applied Microbiology*. 36:197-202.
- Li, Q., K.R. Curtis, J.J. McCluskey, and T.I. Wahl. 2003. Consumer Attitudes toward Genetically Modified Foods in China. *AgBioForum*. 5:145-152.
- Loureiro, M.L., J.J. McCluskey, and R.C. Mittelhammer. 2003. Are Stated Preferences Good Predictors of Market Behavior? *Land Economics*. 79:44-55.
- Lusk, J.L., J. Roosen, and J.A. Fox, 2003. Demand for Beef with Growth Hormones. *American Journal of Agricultural Economics*. 85:16-29.
- Costello, M., M.S. Rhee, M.P. Bates, S. Clark, L.O. Luedecke, and D.H. Kang. 2003. Eleven-Year Trends of Microbiological Quality in Bulk Tank Milk. *Food Protection Trends*. 23:393-400.
- Rhee, M.S., S.Y. Lee, and D.H. Kang. 2003. Factors Affecting Antimicrobial Activity of Prepared Mustards against *Escherichia coli* O157:H7, *Listeria monocytogenes*, and *Salmonella typhimurium*. *Applied and Environmental Microbiology*. 69:2959-2963.
- Rhee, M.S., S.Y. Lee, V. Hillers, S. McCurdy, and D.H. Kang. 2003. Evaluation of Consumer-Style Cooking Methods for Reduction of *Escherichia coli* O157:H7 in Hamburger. *Journal of Food Protection*. 66:1030-1034.
- McCluskey, J.J., and G.C. Rausser. 2003. Stigmatized Asset Value: Is it Temporary or Permanent? *The Review of Economics and Statistics*. 85:276-285.
- McCluskey, J.J., and G.C. Rausser. 2003. Hazardous Waste Sites and Housing Appreciation Rates. *Journal of Environmental Economics and Management*. 45:166-176.
- McCluskey, J.J., and M.L. Loureiro, 2003. Consumer Preferences and Willingness to Pay for Food Labeling: A Discussion of Empirical Studies. *Journal of Food Distribution Research*. 34:95-102.
- McCluskey, J.J., H. Ouchi, K.M. Grimsrud, and T.I. Wahl. 2003. Consumer Response to Genetically Modified Food Products in Japan. *Agricultural and Resource Economics Review*. 32:321-333.

Nindo, C., S. Ting, S.W. Wang, J. Tang, and J.R. Powers. 2003. Evaluation of Drying Technologies for Retention of Physical and Chemical Quality of Green Asparagus (*Asparagus officinalis*, L.). Food Science and Technology. (LWT) 36:507-516.

Nindo, C.I., H. Feng, G.Q. Shen, J. Tang, and D.H. Kang. 2003. Drying of Pumpkin Purees with a New Film Drying Method: Kinetics and Bactericidal Effect. Journal of Food Processing and Preservation. 27:117-136.

Olivas, G.I., J.J. Rodriguez, and G.V. Barbosa-Canovas. 2003. Edible Coatings Composed by Methylcellulose, Stearic Acid, and Additives to Preserve Quality of Pear Wedges. Journal of Food Processing and Preservation. 27:299-320.

Park, C.S., B.H. Hong, and B.-K. Baik. 2003. Protein Quality of Wheat Required for Making White Salted Noodles and its Influences on Processing and Texture of Noodles. Cereal Chemistry. 80:297-303.

Quagrainie, K., J.J. McCluskey, and M.L. Loureiro. 2003. A Latent Approach to Measuring Reputation. Southern Economic Journal. 67:966-977.

Wang S., J. Tang, R.P. Cavaliere, and D. Davis, 2003. Differential Heating of Insects in Dried Nuts and Fruits Associated with Radio Frequency and Microwave Treatments. Transactions of ASAE. 46:1175-1182.

Wang S., J. Tang, J.A. Johnson, E. Mitcham, J.D. Hansen, G. Hallman, S.R. Drake, and Y. Wang. 2003. Dielectric Properties of Fruits and Insect Pests as Related to Radio Frequency and Microwave Treatments. Biosystems Engineering. 85:201-212.

0972 DEVELOPMENT OF VALUE-ADDED EXPORTABLE FOOD INGREDIENTS AND PRODUCTS FROM BARLEY GROWN IN THE PACIFIC NORTHWEST

Dalgetty, D.D., and B.-K. Baik. 2003. Isolation and Characterization of Cotyledon Fibers from Peas, Lentils, and Chickpeas. Cereal Chemistry. 80:310-315.

Institute of Biological Chemistry:

0119 REGULATION OF PHOTOSYNTHETIC PROCESSES

Gibson, K.M., S.K. Hwang, G.E. Edwards, T.W. Okita, C. Kato, H. Matsui, and H. Ito. 2003. Metabolic Engineering of Starch for Enhanced Plant Productivity and Yields. Journal of Applied Glycoscience. 50:201-206.

0197 THE FLEXIBILITY OF THE LIGHT REACTIONS OF PHOTOSYNTHESIS

Kramer, D.M., A.G. Roberts, F. Muller, J. Cape, and M.K. Bowman. 2003. Q-cycle Bypass Reactions at the Qo Site of the Cytochrome bc1 (and Related) Complexes. Methods in Enzymology. 382:21-45.

Kramer, D.M., J.A. Cruz, and A. Kanazawa. 2003. Balancing the Central Roles of the Thylakoid Proton Gradient. Trends in Plant Science. 8:27-32.

Roberts, A., W. Gregor, R.D. Britt, and D.M. Kramer. 2003. Acceptor and Donor-Side Interactions of Phenolic Inhibitors in Photosystem II. Biochimica et Biophysica Acta. 1604:23-32.

0253 LIPID BIOSYNTHESIS IN LEAVES AND SEEDS

Shockey, J., M. Fulda, and J. Browse. 2003. Arabidopsis Contains a Large Superfamily of Acyl-Activating Enzymes. Phylogenetic and Biochemical Analysis Reveals a New Class of Acyl-CoA Synthetases. Plant Physiology. 132:1065-1076.

0268 BIOCHEMISTRY OF PLANT TERPENOIDS

Carter, O.A., R.J. Peters, and R. Croteau. 2003. Monoterpene Biosynthesis Pathway Construction in *Escherichia coli*. *Phytochemistry*. 64:425-433.

Hoelscher, D.J., D.C. Williams, M.R. Wildung, and R. Croteau. 2003. A cDNA Clone for 3-Carene Synthase from *Salvia stenophylla*. *Phytochemistry*. 62:1081-1086.

Mahmoud, S.S. and R.B. Croteau. 2003. Menthofuran Regulates Essential Oil Biosynthesis in Peppermint by Controlling a Downstream Monoterpene Reductase. *Proceedings of the National Academy of Science*. 100:14481-14486.

Peters, R.J. and R.B. Croteau. 2003. Alternative Termination Chemistries Utilized by Monoterpene Cyclases: Chimeric Analysis of Bornyl Diphosphate, 1,8-Cineole, and Sabinene Synthases. *Archives of Biochemistry and Biophysics*. 417:203-211.

Phillips, M.A., M.R. Wildung, D.C. Williams, D.C. Hyatt, and R. Croteau. 2003. cDNA Isolation, Functional Expression and Characterization of (+)-Alpha-Pinene Synthase and (-)-Alpha-Pinene Synthase from Loblolly Pine (*Pinus taeda*): Stereocontrol in Pinene Biosynthesis. *Archives of Biochemistry and Biophysics*. 411:267-276.

Ringer, K.L., M.E. McConkey, E.M. Davis, G.W. Rushing, and R. Croteau. 2003. Monoterpene Double-Bond Reductases of the (-)-Menthol Biosynthetic Pathway: Isolation and Characterization of cDNAs Encoding (-)-Isopiperitenone Reductase and (+)-Pulegone Reductase of Peppermint. *Archives of Biochemistry and Biophysics*. 418:80-92.

Schalk, M., C. Berteau, C.J.D. Mau, F. Karp, M.R. Wildung, and R. Croteau. 2003. Molecular Evaluation of a Spearmint Mutant Altered in the Expression of Limonene Hydroxylases that Direct Essential Oil Monoterpene Biosynthesis. *Phytochemistry*. 64:1203-1211.

0590 RNA TARGETING IN PLANTS

Hamada, S., K. Ishiyama, S.-B. Choi, C. Wang, S. Singh, N. Kawai, V.R. Franceschi and T.W. Okita. 2003. The Transport of Prolamine RNAs to Prolamine Protein Bodies in Living Rice Endosperm Cells. *Plant Cell*. 15:2253-2264.

Hamada, S., K. Ishiyama, C. Salkusingharaj, S.-B. Choi, Y. Wu, C. Hwang, S. Singh, N. Kawai, J. Messing, and T.W. Okita. 2003. Multiple RNA Transport Pathways to the Cortical Region in Developing Rice Endosperm. *Plant Cell*. 15:2265-2272.

0773 NUTRIENT EXCHANGE AND METABOLISM IN THE RHIZOBIUM-LEGUME SYMBIOSIS

Denison, R.F., C. Bledsoe, M. Kahn, F. O'Gara, E.L. Simms, and L.S. Thomashow. 2003. Cooperation in the Rhizosphere and the 'Free Rider' Problem. *Ecology*. 84:838-845.

0967 DITERPENE BIOSYNTHESIS IN TAXOL PRODUCTION AND CONIFER DEFENSE

Horiguchi, T., C.D. Rithner, R. Croteau, and R.M. Williams. 2003. Studies on Taxol Biosynthesis. Preparation of 5 Alpha-Acetoxytaxa-4(20), 11(12)-dien-2Alpha, 10Beta-diol Derivatives by Deoxygenation of a Taxadiene Tetra-Acetate Obtained from Japanese Yew. *Tetrahedron*. 59:267-273.

Jennewein, S., C.D. Rithner, R.M. Williams, and R. Croteau. 2003. Taxoid Metabolism: Taxoid 14Beta-Hydroxylase is a Cytochrome P450-Dependent Monooxygenase. *Archives of Biochemistry and Biophysics*. 413:262-270.

Ketchum, R.E.B., C.D. Rithner, D. Qiu, Y.S. Kim, R.M. Williams, and R.B. Croteau. 2003. Taxus Metabolomics: Methyl Jasmonate Preferentially Induces Production of Taxoids Oxygenated at C-13 in *Taxus x media* Cell Cultures. *Phytochemistry*. 62:901-909.

Peters, R.J., O.A. Carter, Y. Zhang, B.W. Matthews, and R.B. Croteau. 2003. Bifunctional Abietadiene Synthase: Mutual Structural Dependence of the Active Sites for Protonation-Initiated and Ionization-Initiated Cyclizations. *Biochemistry*. 42:2700-2707.

1791 POLYPEPTIDE SIGNALING FOR PLANT DEFENSE, GROWTH, AND DEVELOPMENT

Stenzel, I., B. Hause, G. Maucher, A. Pitzschke, O. Miersch, J. Ziegler, C.A. Ryan, and C. Wasternack. 2003. Allene Oxide Cyclase Dependence of the Wound Response and Vascular Bundle-Specific Generation of Jasmonates in Tomato-Amplification in Wound Signaling. *Plant Journal*. 33:577-589.

Pearce, G., and C.A. Ryan. 2003. Systemic Signaling in Tomato Plants for Defense against Herbivores. *Journal of Biological Chemistry*. 278:30044-30050.

Barrette, I.H., K.K.-S. Ng, M.M. Cherney, G. Pearce, C.A. Ryan, and M.N.G. James. 2003. Structural Basis of Inhibition Revealed by a 1:2 Complex of the Two-Headed Tomato Inhibitor-II and Subtilisin Carlsberg. *Journal of Biological Chemistry*. 278:24062-24071.

Barrette, I.H., K.K.-S. Ng, M.M. Cherney, G. Pearce, U. Ghani, C.A. Ryan, and M.N.G. James. 2003. Unbound Form of Tomato Inhibitor II Reveals Interdomain Flexibility and Conformational Variability in the Reactive Site Loops. *Journal of Biological Chemistry*. 278:31391-31400.

Scheer, J.M., G. Pearce, and C.A. Ryan. 2003. Generation of Systemin Signaling in Tobacco by Transformation with the Tomato Systemin Receptor Kinase Gene. *Proceedings of the National Academy of Sciences*. 100:10114-10117.

Holley, S.R., R.D. Yalamanchili, D. Moura, C.A. Ryan, and J.W. Stratmann. 2003. Convergence of Signaling Pathways Induced by Systemin, Oligosaccharide Elicitors, and Ultraviolet-B Radiation at the Level of Mitogen-Activated Protein Kinases in *Lycopersicon peruvianum* Suspension-Cultured Cells. *Plant Physiology*. 132:1728-1738.

Orozco-Cardenas, M.L., and C.A. Ryan. 2003. Polygalacturonase Beta-Subunit Antisense Gene Expression in Tomato Plants Leads to a Progressive Enhanced Wound Response and Necrosis in Leaves and Abscission of Developing Flowers. *Plant Physiology*. 133:693-701.

Ryan, C.A., and G. Pearce. 2003. Systemins: A Functionally Defined Family of Peptide Signals that Regulate Defensive Genes in *Solanaceae* Species. *Proceedings of the National Academy of Sciences*. 100:14577-14580.

Holley, S.R., R.D. Yalamanchili, D.S. Moura, C.A. Ryan, and J.W. Stratmann. 2003. Convergence of Signaling Pathways Induced by Systemin, Oligosaccharide Elicitors, and Ultraviolet-B Radiation on the Level of Mitogen-Activated Protein Kinases in *Lycopersicon peruvianum* Suspension-Cultured Cells. *Plant Physiology*. 132:1728-1738.

3252 BIOCHEMISTRY OF OILSEEDS: NEW STRATEGIES FOR IMPROVING OILS

Tilton, G.B., J.M. Shockey, and J. Browse. 2003. Biochemical and Molecular Characterization of ACH2, an Acyl-CoA Thioesterase from *Arabidopsis thaliana*. *Journal of Biological Chemistry*. 279:7487-7494.

4589 Metabolic Engineering of Plants for Enhanced Productivity

Gibson, K.M., S.K. Hwang, G.E. Edwards, T.W. Okita, C. Kato, H. Matsui, and H. Ito. 2003. Metabolic Engineering of Starch for Enhanced Plant Productivity and Yields. *Journal of Applied Glycoscience*. 50:201-206.

Satoh, H., A. Nishi, N. Fujita, A. Kubo, Y. Nakamura, T. Kawasaki, and T.W. Okita. 2003. Isolation and Characterization of Starch Mutants in Rice. *Journal of Applied Glycoscience*. 50:225-230.

6204 THE MOLECULAR BASIS OF HEARTWOOD FORMATION: A NEW FRONTIER TO EXPLOIT WOOD PROPERTIES

Min, T., H. Kasahara, D.L. Bedgar, B. Youn, P.K. Lawrence, D.R. Gang, S.C. Halls, H. Park, J.L. Hilsenbeck, L.B. Davin, N.G. Lewis, and C.H. Kang. 2003. Crystal Structures of Pinoresinol-Lariciresinol and Phenylcoumaran Benzylic Ether Reductases and their Relationship to Isoflavone Reductases. *Journal of Biological Chemistry*. 278:50714-50723.

Natural Resource Sciences:

0113 EFFECTS OF ENHANCED UV-B RADIATION AND CO₂ LEVELS ON ECOPHYSIOLOGY OF TREE SPECIES

Bassman, J.H., G.E. Edwards, and R. Robberecht. 2003. Photosynthesis and Growth in Seedlings of Five Forest Tree Species with Contrasting Leaf Anatomy Subjected to Supplemental UV-B Radiation. *Forest Science*. 49:176-187.

Bassman, J.H., J.D. Johnson, L. Fins, and J.P. Dobrowolski. 2003. Rocky Mountain Ecosystems: Diversity, Complexity, and Interactions. *Tree Physiology*. 23:1081-1089.

Schlosser, W.E., J.H. Bassman, P. Weinschneider, and R.L. Everett. 2003. A Carbon Balance Assessment for Containerized Conifer Seedlings in the Russian Far East. *Forest Ecology and Management*. 173:335-351.

Warren, J.M., J.H. Bassman, J.K. Fellman, S.D. Eigenbrode, and D.S. Mattinson. 2003. Ultraviolet-B Radiation Alters Phenolic Salicylate and Flavonoid Composition of *Populus trichocarpa* Leaves. *Tree Physiology*. 23:527-535.

0226 NUTRITIONAL ECOLOGY OF GRIZZLY BEARS IN YELLOWSTONE NATIONAL PARK

Felicetti, L.A., C.T. Robbins, and L.A. Shipley. 2003. Dietary Protein Content Alters Energy Expenditure and Composition of the Gain in Grizzly Bears (*Ursus arctos horribilis*). *Physiological and Biochemical Zoology*. 76:256-261.

Felicetti, L.A., R.O. Rye, C.C. Schwartz, M.A. Haroldson, K.A. Gunther, D.L. Phillips, and C.T. Robbins. 2003. Use of Sulfur and Nitrogen Stable Isotopes to Determine the Importance of Whitebark Pine Nuts to Yellowstone Grizzly Bears. *Canadian Journal of Zoology*. 81:763-770.

Nelson, O.L., M.-M. McEwen, C.T. Robbins, L.A. Felicetti, and W.F. Christensen. 2003. Cardiac Function in Active and Hibernating Grizzly Bears. *Journal of the American Veterinary Medical Association*. 223:1170-1175.

0396 NATURAL RESOURCE/FOREST BASED COMMUNITIES IN THE NEW MILLENNIUM: INTERNAL RESPONSES TO EXOGENOUS FORCES.

Carroll, M.S., K.A. Blatner, and P. Cohn. 2003. Somewhere Between: Social Embeddedness and the Spectrum of Wild Edible Huckleberry Harvest and Use. *Rural Sociology*. 68:319-342.

Rodriguez-Mendez, S., M.S. Carroll, S.E. Daniels, A.J. Finley, and K.A. Blatner. 2003. Smoke on the Hill: A Comparative Study of Wildfire and Two Forest Communities. *Western Journal of Applied Forestry*. 18:60-70.

0417 THE EFFECTS OF NUTRITION AND HABITAT QUALITY ON DECLINING WILDLIFE POPULATIONS

Sponheimer, M., T. Robinson, L. Ayliffe, B. Roeder, L. Shipley, E. Lopez, A. West, J. Hammer, B. Passey, T. Cerling, D. Dearing*, and J. Ehleringer. 2003. An Experimental Study of Carbon-Isotope Fractionation between Diet, Hair, and Feces of Mammalian Herbivores. *Canadian Journal of Zoology*. 81:871-876.

Plant Pathology:

0274 DEVELOPMENT AND IMPLEMENTATION OF DIRECT-SEED CEREAL-BASED CROPPING SYSTEMS FOR THE INLAND NORTHWEST

Cook, R.J. 2003. Take-All of Wheat. *Physiological and Molecular Plant Pathology*. 62:87-98.

0300 POPULATION BIOLOGY OF PLANT PATHOGENIC FUNGI

Akimitsu, K., T.L. Peever, and L.W. Timmer. 2003. Molecular, Ecological and Evolutionary Approaches to Understanding *Alternaria* Diseases of Citrus. *Molecular Plant Pathology*. 4:435-446.

Barve, M.P., T. Arie, S.S. Salimath, F.J. Muehlbauer, and T.L. Peever. 2003. Cloning and Characterization of the Mating Type (MAT) Locus from *Ascochyta rabiei* (teleomorph: *Didymella rabiei*) and a MAT Phylogeny of Legume-Associated *Ascochyta* spp. *Fungal Genetics and Biology*. 38:151-167.

Milgroom, M.G., and T.L. Peever. 2003. Population Biology of Plant Pathogens: The Synthesis of Plant Disease Epidemiology and Population Genetics. *Plant Disease*. 87:608-617.

Peever, T.L., and T.D. Murray. 2003. First Report of Tan Spot of Wheat in the U.S. Pacific Northwest Caused by *Pyrenophora tritici-repentis*. *Plant Disease*. 87:203.

0572 TELEOMORPH-ANAMORPH CONNECTIONS IN LIGNICOLOUS PYRENOMYCETES

Kerrigan, J., M.T. Smith, J.D. Rogers, G.A. Poot, and G.W. Douhan. 2003. *Ascobotryozyma cognata* sp. nov., a New Ascomycetous Yeast Associated with Nematodes from Wood-Boring Beetle Galleries. *Mycological Research*. 107:1110-1120

Kerrigan, J., and J.D. Rogers. 2003. Microfungi Associated with the Wood-Boring Beetles *Saperda calcarata* (Poplar Borer) and *Cryptorhynchus lapethi* (Poplar and Willow Borer). *Mycotaxon*. 86:1-18.

0669 CONTROLLING EYESPOT IN WINTER WHEAT WITH DISEASE RESISTANCE

Douhan, G.D., T.D. Murray, and P.S. Dyer. 2003. Population Genetic Structure of *Tapesia acuformis* in Washington State. *Phytopathology*. 93:650-656.

0678 DISEASE WARNING SYSTEMS FOR POTATO AND MINT

Johnson, D.A., J.R. Alldredge, P.B. Hamm, and B.E. Frazier. 2003. Aerial Photography used for Spatial Pattern Analysis of Late Blight Infection in Irrigated Potato Circles. *Phytopathology*. 93:805-812.

Johnson, D.A., M. Martin, and T.F. Cummings. 2003. Effect of Chemical Defoliation, Irrigation Water, and Distance from the Pivot on Late Blight Tuber Rot in Center-Pivot Irrigated Potatoes in the Columbia Basin. *Plant Disease*. 87:977-982.

0823 CONTROL OF RUSTS OF WHEAT AND BARLEY

Castro, A.J., X.M. Chen, A. Corey, T. Filichkina, P.M. Hayes, C. Mundt, K. Richardson, S.-S. Islas, and H. Vivar. 2003. Pyramiding and Validation of Quantitative Trait Locus (QTL) Alleles Determining Resistance to Barley Stripe Rust: Effects on Adult Plant Resistance. *Crop Science*. 43:2234-2239.

Chen, X.M., and R.F. Line. 2003. Identification of Genes for Resistance to *Puccinia striiformis* f. sp. *hordei* in 18 Barley Genotypes. *Euphytica*. 129:127-146.

Chen, X.M., M.A. Soria, G.P. Yan, J. Sun, and J. Dubcovsky. 2003. Development of Sequence Tagged Site and Cleaved Amplified Polymorphic Sequence Markers for Wheat Stripe Rust Resistance Gene *Yr5*. *Crop Science*. 43:2058-2064.

Kidwell, K.K., V.L. Demacon, G.B. Shelton, J.W. Burns, B.P. Carter, C.F. Morris, X.M. Chen, and N.A. Bosque-Perez. 2003. Registration of 'Macon' Wheat. *Crop Science*. 43:1561-1563.

Ullrich, S.E., V.A. Jitkov, C.E. Muir, J.W. Burns, P.E. Reisenauer, R.F. Line, X.M. Chen, B.L. Jones, D.M. Wesenberg, and L.D. Robertson. 2003. Registration of 'Bob' Barley. *Crop Science*. 43:1132-1134.

Yan, G.P., X.M. Chen, R.F. Line, and C.R. Wellings. 2003. Resistance Gene Analog Polymorphism Markers Co-Segregating with the *Yr5* Gene for Resistance to Wheat Stripe Rust. *Theoretical and Applied Genetics*. 106:636-643.

0947 METABOLITES OF BIOCONTROL AGENTS THAT SUPPRESS ROOT PATHOGENS OF WHEAT AND BARLEY

Landa, B.B., D.M. Mavrodi, L.S. Thomshow, and D.M. Weller. 2003. Interactions Between Strains of 2,4-Diacetylphloroglucing-Producing *Pseudomonas Fluorescens* in the Rhizosphere of Wheat. *Phytopathology*. 93:982-994

Ownley, B.H., B.K. Duffy, and D.M. Weller. 2003. Identification and Manipulation of Soil Properties to Improve the Biological Control Performance of Phenazine-Producing *Pseudomonas fluorescens*. *Applied Environmental Microbiology*. 69:3333-3343.

1767 MYCOBIOTIC, REVISIONARY, AND MONOGRAPHIC STUDIES IN XYLARIACEAE AND RELATED FAMILIES

Ju, Y.-M., J.D. Rogers, and H.M. Hsieh. 2003. The Genus *Theissenia*: *T. pyrenocrata*, *T. cinerea* sp. nov., and *T. eurima* sp. nov. *Mycologia*. 95:109-116.

Rogers, J.D., and M.E. Barr. 2003. *Astrosphaeriella longispora*, A New Tropical Species with Large Ascospores. *Sydowia* 55:355-358.

Rogers, J.D., and Y.-M. Ju. 2003. *Occultitheca costaricensis* gen. et sp. nov. and *Apiocamarops pulvinata* sp. nov. from Costa Rica. *Sydowia*. 55:359-364.

Rogers, J.D., D.E. Hemmes, and Y.-M. Ju. 2003. *Xylaria kaumanae* sp. nov. From the Island of Hawaii (Hawaii, USA). *Sydowia*. 55:104-108.

1844 REGULATION OF DISEASE RESISTANCE GENES

Hadwiger, L.A., S.J. Klosterman, and J.J. Choi. 2003. The Mode of Action of Chitosan and its Oligomers in Inducing Plant Promoters and Developing Disease Resistance in Plants. *Advances in Chitin Science*. 5:452-457.

Klosterman, S.J., J.J. Choi, and L.A. Hadwiger. 2003. Analysis of Pea HMG-I/Y Expression Suggests a Role in Defense Gene Regulation. *Molecular Plant Pathology*. 4:249-258.

Statistics:

0254 ANALYSIS OF RESOURCE SELECTION USING GENERALIZED LINEAR MIXED MODELS

Allredge, J.R., and N. Dasgupta. 2003. Multiple Comparisons in Resource Selection Using Logistic Regression. *Journal of Agricultural, Biological, and Environmental Statistics*. 8:356-366.

Veterinary Science:

0261 ENTERIC DISEASES OF SWINE AND CATTLE: PREVENTION, CONTROL AND FOOD SAFETY

Gally, D.L., S.W. Naylor, J.C. Low, G.J. Gunn, B.A. Synge, M.C. Pearce, W. Donachie, and T.E. Besser. 2003. Colonization Site of *E coli* O157 in Cattle. *Veterinary Record*. 152:307.

Naylor, S.W., J.C. Low, T.E. Besser, A. Mahajan, G.J. Gunn, M.C. Pearce, I.J. McKendrick, D.G. Smith, and D.L. Gally. 2003. Lymphoid Follicle-Dense Mucosa at the Terminal Rectum is the Principal Site of Colonization of Enterohemorrhagic *Escherichia coli* O157:H7 in the Bovine Host. *Infection and Immunology*. 71:1505-12.

Call, D.R., M.K. Borucki, and T.E. Besser. 2003. Mixed-Genome Microarrays Reveal Multiple Serotype and Lineage-Specific Differences among Strains of *Listeria monocytogenes*. *Journal of Clinical Microbiology*. 41:632-9.

Rice, D.H., D.D. Hancock, and T.E. Besser. 2003. Faecal Culture of Wild Animals for *Escherichia coli* O157:H7. *Veterinary Record*. 152:82-3.

Rice, D.H., D.D. Hancock, P.M. Roozen, M.H. Szymanski, B.C. Scheenstra, K.M. Cady, T.E. Besser, and P.A. Chudek. 2003. Household Contamination with *Salmonella Enterica*. *Emerging Infectious Diseases*. 9:120-2.

Wang, H.-F., J.B. Swain, T.E. Besser, D. Jasmer, and C.R. Wyatt. 2003. Detection of Antibodies to a Recombinant *Cryptosporidium parvum* P23 in Serum and Feces from Neonatal Calves. *Journal of Parasitology*. 89:918-923.

Davis, M.A., D.D. Hancock, D.H. Rice, D.R. Call, R. DiGiacomo, M. Samadpour, and T.E. Besser. 2003. Feedstuffs as a Vehicle of Cattle Exposure to *Escherichia coli* O157:H7 and *Salmonella enterica*. *Veterinary Microbiology*. 95:199-210.

Davis M.A., D.D. Hancock, T.E. Besser, and D.R. Call. 2003 Evaluation of Pulsed-Field Gel Electrophoresis as a Tool for Determining the Degree of Genetic Relatedness between Strains of *Escherichia coli* O157:H7. *Journal of Clinical Microbiology*. 41:1843-1849.

Davis, M.A., D.D. Hancock, T.E. Besser, D.H. Rice, C.J. Hovde, R. Digiacomo, M. Samadpour, and D.R. Call. 2003. Correlation between Geographic Distance and Genetic Similarity in an International Collection of Bovine Faecal *Escherichia coli* O157:H7 Isolates. *Epidemiology Infections*. 131:923-930.

Haack J.P., S. Jelacic, T.E. Besser, E. Weinberger, D.J. Kirk, G.L. McKee, S.M. Harrison, K.J. Musgrave, G. Miller, T.H. Price, and P.I. Tarr. 2003. *Escherichia coli* O157 Exposure in Wyoming and Seattle: Serologic Evidence for Rural Risk. *Emerging Infectious Diseases*. 9:1226-1231.

0709 MASTITIS RESISTANCE TO ENHANCE DAIRY FOOD SAFETY

- Fox, L.K., G.A. Bohach, S.U. Lee, K.T. Park, and Y.H. Park. 2003. Mastitis: Effect on Milk Quality, Causative Agents, and Control. *Korean Journal of Veterinary Public Health*. 27:69-76.
- Fox, L.K., D.D. Hancock, A. Mickelson, and A. Britten. 2003. Bulk Tank Milk Analysis: Factors Associated with Appearance of *Mycoplasma* sp in Milk. *Journal of Veterinarian Medicine, B*. 50:235-240.
- Silk, A.S., L.K. Fox, and D.D. Hancock. 2003. Removal of Hair Surrounding the Teat and Associated Bacterial Counts on Teat Skin Surface, in Milk, and Intramammary Infections. *Journal of Veterinarian Medicine, B*. 50:1-4; *Asian-Australian Journal of Animal Science*. 16:1830-1836.
- Biddle, M.K., L.K. Fox, and D.D. Hancock. 2003. Patterns of *Mycoplasma* shedding in the Milk of Dairy Cows with Intramammary *Mycoplasma* Infection. *JAVMA*. 223:1163-1166.
- Middleton, J.R., V.R. Hebert, L.K. Fox, E. Tomaszewska, and J. Lakritz. 2003. Elimination Kinetics of Chlorhexidine in Milk following Intramammary Infusion to Stop Lactation in Mastitic Mammary Gland Quarters of Cows. *Journal of American Veterinary Medical Association*. 222:1746-9.
- Joo, Y.S., J.S. Moon, L.K. Fox, G.H. Suh, N.H. Kwon, S.H. Kim, and Y.H. Park. 2003. Comparison of Natural Resistance-Associated Macrophage Protein (NRAMP-1) Expression between Cows with High and Low Milk Somatic Cells Counts. *Asian-Australian Journal of Animal Science*. 16:1830-1836.
- Hebert, V.R., J. Middleton, E. Tomaszewska, and L. Fox. 2003. Methodology for Quantifying Residues of Chlorhexidine in Raw Dairy Milk. *Journal of Agricultural and Food Chemistry*. 51:567-570.

0858 INVESTIGATION OF FOOD ANIMAL DISEASE PROBLEMS IN THE STATE OF WASHINGTON

- Bergsten, C., P.R. Greenough, J.M. Gay, W.M. Seymour, and C.C. Gay. 2003. Effects of Biotin Supplementation on Performance and Claw Lesions in Dairy Cows on a Commercial Farm. *Journal of Dairy Science*. 86:3953-3962.

RESEARCH AND EXTENSION CENTERS

Northwest Washington Mt. Vernon Research and Extension Center:

In association with the Plant Pathology Department

0336 INTEGRATED DISEASE CONTROL PROGRAMS FOR FRESH MARKET AND PROCESSING VEGETABLE CROPS IN WASHINGTON

- du Toit, L.J., D.A. Inglis, and G.Q. Pelter. 2003. *Fusarium Proliferatum* Pathogenic on Onion Bulbs in Washington. *Plant Disease*. 87:750.
- Inglis, D.A., B. Gundersen, and J. Myers. 2003. Using Improved Host Resistance to Control Late Blight on Tomato. Fungicide and Nematicide Tests. 58:V00202.
- Inglis, D., and B. Gundersen. 2003. Evaluation of Seed, In-Furrow and Foliar Treatments for Control of *Rhizoctonia* on Potato. Fungicide and Nematicide Tests. 58: V00302.

0365 INTEGRATED DISEASE MANAGEMENT OF SMALL-SEEDED VEGETABLE SEED CROPS IN WASHINGTON STATE

- du Toit, L.J., D.A. Inglis, and G.Q. Pelter. 2003. *Fusarium Proliferatum* Pathogenic on Onion Bulbs in Washington. *Plant Disease*. 87:750.
- du Toit, L.J., and G.Q. Pelter. 2003. Wilt of Radish caused by *Fusarium oxysporum* f. sp. Raphani in Washington State. *Plant Health Progress* doi:10.1094/PHP-2003-0616-01-HN;
<http://www.plantmanagementnetwork.org/sub/php/brief/2003/radish/>

Prosser Irrigated Agriculture Research and Extension Center:

In association with the Crop and Soil Sciences Department

0257 DEVELOPING SOIL AND PLANT NUTRIENT MANAGEMENT STRATEGIES TO ADDRESS VARIABILITY IN PERENNIAL CROP SYSTEMS

- Davenport, J.R., J.M. Marden, L.J. Mills, and M.J. Hattendorf. 2003. Concord Grape Response to Variable Rate Nutrient Management. *American Journal of Viticulture and Enology*. 54:286-293.

0281 ALTERNATE CROPS FOR IRRIGATED CENTRAL WASHINGTON

- Hang, A.N., P.N. Miklas, and M.J. Sibernagel. 2003. Registration of 'Orca' Black and White Anazasi-Type Dry Bean. *Crop Science*. 43:1882.

In association with the Entomology Department

0337 APHIDS: ECOLOGY, SYSTEMATICS, BIOCONTROL

- Miller, R.H., O. Idechiil, R.G. Foottit, and K.S. Pike. 2003. *Uroleucon formosanum* (Takahashi) (Homoptera: Aphididae) found on *Youngia japonica* (L.) DC on Guam and Rota in the Mariana Islands. *Proceedings of the Hawaiian Entomology Society*. 36:125-127.

- Pike, K.S., and P. Stary. 2003. *Ericaphis louisae*, n. sp. (Hemiptera: Aphidinae: Macrosiphini) on *Luetkea pectinata* (Pursh) (Rosaceae), and a Key to *Ericaphis* Species. *Proceedings of the Entomology Society*. 105: 459-465.

- Pike, K.S., P. Stary, and G. Graf. 2003. Description of a New Species of *Braconidae*, *Monoctonus allisoni* (Hymenoptera, Braconidae, Aphidiinae) and Discussion of the Aphid-Parasitoid Guild for *Nasonovia* spp. (Hemiptera, Aphididae) in Northwestern. *Proceedings for the Entomological Society in Washington*. 105:379-386.

0381 DEVELOPMENT OF INTEGRATED MANAGEMENT SYSTEMS FOR HIGH VALUE SPECIALTY CROPS IN CENTRAL WASHINGTON

- James, D.G., and T.S. Price. 2003. Field-Testing of Methyl Salicylate for Recruitment and Retention of Beneficial Insects in Grapes and Hops. *Journal of Chemical Ecology*. 29:1601-1609.
- James, D.G. 2003. Pesticide Susceptibility of Two Coccinellids (*Stethorus punctum picipes* (Casey) and *Harmonia axyridis* Pallas) Important in Biological Control of Mites and Aphids in Washington Hops. *Biocontrol Science and Technology*. 13:253-259.
- James, D.G. 2003. Field Evaluation of Herbivore-Induced Plant Volatiles as Attractants for Beneficial Insects: Methyl Salicylate and the Green Lacewing, *Chrysopa nigricornis*. *Journal of Chemical Ecology*. 29:1601-1609.
- James, D.G., R.J. Petroski, A. Cosse, B.W. Zilkowski, and R.J. Bartelt. 2003. Bioactivity, Synthesis and Chirality of Currant Stem Girdler, *Janus integer*. *Journal of Chemical Ecology*. 29:2189-2199.

Prischmann, D.A., and D.G. James. 2003. *Phytoseiidae* on Unsprayed Vegetation in Southcentral Washington: Implications for Biological Control of Spider Mites on Wine Grapes. *International Journal of Acarology*. 29:279-287.

0524 BIOLOGY AND INTEGRATED MANAGEMENT OF INSECT AND MITE PESTS OF WINE GRAPES

James, D.G., and T.S. Price. 2003. Field-Testing of Methyl Salicylate for Recruitment and Retention of Beneficial Insects in Grapes and Hops. *Journal of Chemical Ecology*. 29:1601-1609.

James, D.G. 2003. Toxicity of imidacloprid to *Galendromus occidentalis*, *Neoseiulus fallacis* and *Amblyseius andersoni* (Acari: *Phytoseiidae*) in Washington State. *Experimental and Applied Acarology*. 31:275-281

James, D.G. 2003. Field Evaluation of Herbivore-Induced Plant Volatiles as Attractants for Beneficial Insects: Methyl Salicylate and the Green Lacewing, *Chrysopa nigricornis*. *Journal of Chemical Ecology*. 29:1601-1609.

In association with the Horticulture Landscape and Architecture Department

0168 GENE TRANSFER FOR POTATO VARIETY DEVELOPMENT

Brown, C.R., R. Wrolstad, R. Durst, C.-P. Yang, and B.A. Clevidence. 2003. Breeding Studies in Potatoes Containing High Concentrations of Anthocyanins. *American Journal of Potato Research*. 80:241-250

Brown, C.R., H. Mojtahedi, G.S. Santo. 2003. Characteristics of Resistance to Columbia Root-Knot Nematode introgressed from Several Mexican and North American Wild Potato Species. *Acta Horticulturae*. 619:117-125

Novy, R.G., D.L. Corsini, S.L. Love, J.J. Pavek, A.R. Mosley, S.R. James, D.C. Hane, C.C. Shock, K.E. Rykbost, C.R. Brown, R.E. Thornton, and A. Alturas. 2003. A Multipurpose, Russet Potato Cultivar with High Yield and Tuber Specific Gravity. *American Journal of Potato Research*. 79:295-301.

0420 INTEGRATING WHOLE-TREE PHYSIOLOGICAL, HORTICULTURAL, AND GENETIC RESEARCH IN PRUNUS TREE FRUITS

Peterson, D., M.D. Whiting, and S. Wolford. 2003. Fresh Market Quality Sweet Cherry Harvester. *Applied Engineering in Agriculture*. 19:539-543.

In association with the Plant Pathology Department

0290 DEVELOPING MANAGEMENT STRATEGIES FOR PLANT VIRUSES AND VIRUS-LIKE AGENTS THAT INFECT PERENNIAL VEGETATIVELY-PROPAGATED CROP PLANTS IN THE U.S.

Cembali, T., R.J. Folwell, P. Wandschneider, K.C. Eastwell, and W. Howell. 2003. Economic Implications of a Virus Prevention Program in Deciduous Tree Fruits in the U.S. *Crop Protection*. 22:1149-1156.

0423 EPIDEMIOLOGY AND MANAGEMENT OF POWDERY MILDEW OF WINE GRAPES

Glawe, D.A., G.E. Windom, G.G. Grove, and J.S. Falacy. 2003. First Report of Powdery Mildew of *Convolvulus arvensis* (Field Bindweed) Caused by *Erysiphe convolvuli* var. *convolvuli* in North America. *Plant Health Progress*. doi:10.1094/PHP-2003-1021-01-HN.

0460 IMPROVING DISEASE MANAGEMENT OF SOILBORNE DISEASES OF EDIBLE LEGUMES

Grunwald, N.J., V.A. Coffman, and J.M. Kraft. 2003. Sources of Resistance to Fusarium Root Rot in the Pisum Core Collection. *Plant Disease*. 87:1197-1200.

Grunwald, N.J., S.B. Goodwin, M.G. Milgroom, and W.E. Fry. 2003. Analysis of Genotypic Diversity Data for Populations of Microorganisms. *Phytopathology*. 93:738-746.

Flier, W.G., N.J. Grunwald, L.P. N.M. Kroon, A.K. Sturbaum, G.B.M. van den Bosch, E. Gray-Serrano, W. E. Fry, and L. J. Turkensteen. 2003. The Population Structure of *Phytophthora infestans* from the Toluca Valley in Central Mexico Suggests Genetic Differentiation between Populations from Cultivated Potato and Wild Solanum Species. *Phytopathology*. 93:382-390.

1262 NATIONAL PROGRAM FOR CONTROLLING VIRUS DISEASES OF TEMPERATE FRUIT TREE CROPS

Cembali, T., R.J. Folwell, P. Wandschneider, K.C. Eastwell, and W. Howell. 2003. Economic Implications of a Virus Prevention Program in Deciduous Tree Fruits in the US. *Crop Protection*. 22:1149-1156.

Puyallup Research and Extension Center:

In association with the Animal Science Department

0154 ENVIRONMENTAL AND ECONOMIC IMPACTS OF NUTRIENT MANAGEMENT IN DAIRY FORAGE SYSTEMS

Johnson, L.J., J.H. Harrison, D. Davidson, C. Hunt, W.C. Mahanna, and K. Shinnars. 2003. Corn Silage Management: Effects of Hybrid, Maturity, Chop Length, and Mechanical Processing on Rate and Extent of Digestion. *Journal of Dairy Science*. 86:3271-3299.

Johnson, L.J., J.H. Harrison, D. Davidson, W.C. Mahanna, and K. Shinnars. 2003. Corn Silage Management: Effects of Hybrid, Maturity, Inoculation, and Mechanical Processing on Fermentation Characteristics. *Journal of Dairy Science*. 86:287-308.

Johnson, L.J., J.H. Harrison, D. Davidson, C. Hunt, W.C. Mahanna, and K. Shinnars. 2003. Corn Silage Management: Effects of Hybrid, Chop Length on Digestion, and Energy Content. *Journal of Dairy Science*. 86:208-231.

In association with the Crop and Soil Sciences Department

0308 TURFGRASS FERTILIZER AND PESTICIDE IMPACTS ON SURFACE WATER QUALITY

Miltner, E., A. Bary, and C. Cogger. 2003. Clopyralid and Compost: Formulation and Mowing Effects on Herbicide Content of Grass Clippings. *Compost Science and Utilization*. 11:289-299.

0690 CHEMISTRY AND BIOAVAILABILITY OF WASTE CONSTITUENTS IN SOILS

Huang, B., S. Kuo, and R. Bembeneck. 2003. Cadmium and Zinc in Some Phosphorus and Trace Element Fertilizers and Availability to Leaf Lettuce. *Water, Air, and Soil Pollution*. 147:109-127.

Huang, B., S. Kuo, and R. Bembeneck. 2003. Cadmium Uptake by Cucumber from Soil Amended with Phosphorus Fertilizers. *Journal of American Society in Horticulture Science*. 128:615-620.

In association with the Entomology Department

0327 THE DELAY IN POPULATION GROWTH: A NEW APPROACH FOR ESTIMATING TOXICITY OF PESTICIDES TO POPULATIONS OF PEST AND BENEFICIAL ORGANISMS

Kramarz, P., and J.D. Stark. 2003. Population Level Effects of Cadmium and the Insecticide, Imidacloprid to the Parasitoid, *Aphidius ervi* after Exposure Through its Host, the Pea Aphid, *Acyrtosiphon pisum*. *Biological Control*. 27:310-314.

Stark, J.D., J.E.Banks, and R.I. Vargas. 2003. How Risky is Risk Assessment? The Role that Life History Strategies Play in Susceptibility of Species to Pesticides and Other Toxicants. *Proceedings of the National Academy of Science*. 101:732-736.

Stark, J.D., and R.I. Vargas. 2003. Demographic Changes in *Daphnia pulex* (Leydig) after Exposure to the Insecticides, Spinosad and Diazinon. *Ecotoxicology and Environmental Safety*. 56:334-338.

In association with the Horticulture and Landscape Architecture Department

0313 SYSTEMATICS AND BIOLOGY OF ECONOMICALLY IMPORTANT FUNGI IN THE PACIFIC NORTHWEST

Falacy, J.S., and D.A. Glawe. 2003. First Report of Powdery Mildew of *Ligustrum japonicum* (Japanese privet) Caused by *Microsphaera syringae* (*Erysiphe syringae*) in North America. *Plant Health Progress*. doi:10.1094/PHP-2003-1210-01-HN.

Glawe, D.A. 2003. First Report of Powdery Mildew of *Mahonia aquifolium* Caused by *Microsphaera berberidis* (*Erysiphe berberidis*) in North America. *Plant Health Progress*. doi:10.1094/PHP-2003-0206-01-HN.

Glawe, D.A. 2003. First Report of Powdery Mildew of *Nandina domestica* Caused by *Microsphaera berberidis* (*Erysiphe berberidis*) in the Pacific Northwest. *Plant Health Progress*. doi:10.1094/PHP-2003-1023-01-HN.

Glawe, D.A. 2003. First Report of Downy Mildew of Chives Caused by *Peronospora destructor* in the Pacific Northwest. *Plant Health Progress*. doi:10.1094/PHP-2003-0512-01-HN.

Glawe, D.A. 2003. First Report of Powdery Mildew of Magnolia Caused by *Microsphaera magnifica* (*Erysiphe magnifica*) in the Pacific Northwest. *Plant Health Progress*. doi:10.1094/PHP-2003-0512-02-HN.

Glawe, D.A. 2003. First Report of Powdery Mildew of *Platanus occidentalis* Caused by *Microsphaera platani* (*Erysiphe platani*) in Washington State. *Plant Health Progress*. doi:10.1094/PHP-2003-0818-01-HN.

Glawe, D.A., R. Hummel, and G. Jack. First Report of Powdery Mildew of *Kalanchoe blossfeldiana* Caused by *Sphaerotheca fuliginea* in the Pacific Northwest. *Plant Health Progress*. doi:10.1094/PHP-2003-0417-02-HN.

Glawe, D.A., G.E. Windom, G.G. Grove, and J.S. Falacy. 2003. First Report of Powdery Mildew of *Convolvulus arvensis* (Field Bindweed) Caused by *Erysiphe convolvuli* var. *convolvuli* in North America. *Plant Health Progress*. doi:10.1094/PHP-2003-1021-01-HN.

0387 MANAGEMENT OF DISEASES ON FIELD AND GREENHOUSE-GROWN ORNAMENTAL BULB CROPS

Copes, W.E., G.A. Chastagner, and R.L. Hummel. 2003. Toxicity Responses of Herbaceous and Woody Ornamental Plants to Chlorine and Hydrogen Dioxides. *Plant Health Progress*. doi:10.1094/PHP-2003-0311-01-RS.

0388 MANAGEMENT OF DISEASES ON CHRISTMAS TREES AND THE IDENTIFICATION OF CHRISTMAS TREES WITH SUPERIOR POSTHARVEST CHARACTERISTICS

Chastagner, G.A, and K.L. Riley. 2003. Postharvest Quality of Noble and Nordmann Fir Christmas Trees. HortScience. 38: 419-421.

Chastagner, G.A. 2003. Late Season Moisture Levels of Christmas Trees on Retail and Wholesale Lots in Washington, Oregon, and California. American Christmas Tree Journal. 47:38-40.

Vancouver Research and Extension Unit:

In association with the Entomology Department

0543 BIOLOGY AND ECONOMIC MANAGEMENT OF ARTHROPOD PESTS OF BERRY CROPS

Tanigoshi, L.K., and P. Stary. 2003. Distribution, Habitats, and Host Plants of the Cherry Bark Tortrix, *Enarmonia formosana* (Scopoli.) in the Czech Republic (*Lep., Tortricidae*). Journal of Pest Science. 76: 41-43.

Tanigoshi, L.K., and P. Stary. 2003. Hymenopterous Parasitoids of the Cherry Bark Tortrix, *Enarmonia formosana* (Scopoli) in Central-East Europe (*Hymenoptera, Ichneumonoidea: Lepidoptera, Tortricidae*). Journal of Pest Science. 76: 100-102.

In association with the Horticulture and Landscape Architecture Department

0375 ALTERNATIVE CROPPING SYSTEMS

Miles, C., D. Granatstein, and C. Feise. 2003. Organic Farming Research and Education at Washington State University. HortScience. 38:755.

Miles, C., and M. Sonde. 2003. Niche Market Dry Bean Variety Trial. HortScience. 38:774.

Wenatchee Tree Fruit Research and Extension Center:

In association with the Crop and Soil Sciences Department

0747 SOIL AND NUTRIENT MANAGEMENT IN WASHINGTON TREE FRUIT ORCHARDS

Peryea, F.J., D. Neilsen, and G. Neilsen. 2003. Boron Maintenance Sprays for Apple: Early-Season Applications and Tank-Mixing with Calcium Chloride. HortScience. 38:542-546.

Wagner, S.E., F.J. Peryea, and R.A. Filby. 2003. Antimony Impurity in Lead Arsenate Insecticide Enhances the Antimony Content of Old Orchard Soils. Journal of Environmental Quality. 32:736-738.

In association with the Entomology Department

1090 MANAGEMENT OF DIRECT INSECT PESTS OF APPLE IN WASHINGTON TREE FRUIT ORCHARDS

Curkovic, T., and J.F. Brunner, 2003. Assessment of an Attracticide Formulation to Control *Cydia pomonella* (L.) (*Lepidoptera: Tortricidae*) in Apple Orchards in Washington State, USA. Agricultura Tecnica. (Chile) 63:231-239.

Krupke, C.H., and J.F. Brunner. 2003. Parasitoids of the Conspere Stink Bug, *Euschistus conspersus*, (*Hemiptera: Pentatomidae*) in North Central Washington and Attractiveness of a Host-Produced Pheromone Component. Journal of Entomological Science. 38: 84-92.

In association with the Horticulture and Landscape Architecture Department

0298 BIOREGULATION OF VEGETATIVE GROWTH AND FRUIT DEVELOPMENT IN APPLE, PEAR, AND SWEET CHERRY FOR MAXIMUM PRODUCTION EFFICIENCY AND FRUIT QUALITY

Drake, S.R., and D.C. Elfving. 2003. Short-Term Controlled Atmosphere Storage for Storage-Life Extension of White-Fleshed Peaches and Nectarines. *Journal of Food Quality*. 26:135-147.

Elfving, D.C., D. Sugar, and D. Faubion. 2003. Pear Tree Shoot Growth Patterns in Relation to Chemical Control of Vegetative Growth with Prohexadione-Calcium (Apogee). *Acta Horticulturae*. 596:711-716.

Elfving, D.C., G.A. Lang, and D.B. Visser. 2003. Prohexadione-Calcium and Ethephon Reduce Shoot Growth and Increase Flowering in Young, Vigorous, Sweet Cherry Trees. *HortScience*. 38:293-298.

Elfving, D.C., L. Lombardini, J.R. McFerson, S.R. Drake, D.F. Faubion, T.D. Auvil, G. Van Ee, and D.B. Visser. 2003. Effects of Directed Applications of Prohexadione-Calcium to Tops of Mature Pear Trees on Shoot Growth, Light Penetration, Pruning, and Fruit Quality. *Journal of the American Pomological Society*. 57:45-57.

Sugar, D., D.C. Elfving, and E.A. Mielke. 2003. Effects of Prohexadione-Calcium on Blossoming, Production, and Fruit Quality in Pear. *Acta Horticulturae*. 596:757-760.

0326 ENHANCE MARKET QUALITY BY IMPROVING FRUIT FINISH IN APPLE

Zhang, J., J. Sun, and L. Schrader. 2003. Comparison of Reflectance of Sunburned Fruit among Three Apple Cultivars. *Journal of Shandong Agricultural University*. 33:88-91.

Zhang, J., J. Sun, and L. Schrader. 2003. Characteristics of Fruit Temperature Change in Apple Trees Under Natural Conditions. *Journal of Shandong Agricultural University*. 33:92-96.

0452 ROOTSTOCK AND INTERSTEM EFFECTS ON POME- AND STONE-FRUIT TREES

Robinson, T., L. Anderson, A. Azarenko, B. Barritt, T. Baugher, G. Brown, G. Couvillon, W. Cowgill, R. Crassweller, P. Domoto, C. Embree, A. Fennell, E. Garcia, A. Gaus, R. Granger, G. Greene, P. Hirst, E. Hoover, S. Johnson, M. Kushad, R. Moran, C. Mullins, S. Myers, R. Perry, C. Rom, J. Schupp, K. Taylor, M. Warmund, J. Warner, and D. Wolfe. 2003. Performance of Cornell-Geneva Apple Rootstocks with 'Liberty' as the Scion in NC-140 Trials across North America. *Acta Horticulturae*. 622:521-530.