

CURRICULUM VITAE
Washington State University
Pullman WA 99164

NAME: Fellman, John Keegan DATE: February 23, 2004

RANK OR TITLE: Professor of Postharvest Physiology

DEPARTMENT: Horticulture and Landscape Architecture

OFFICE LOCATION: Johnson Hall room 51 OFFICE PHONE: 335-3454 email: fellman@wsu.edu

DATE AND PLACE OF BIRTH: November 26, 1952, St. Louis, Missouri

DATE OF PRESENT RANK OR TITLE: July 1, 2002

EDUCATION BEYOND HIGH SCHOOL:

Ph.D. Biochemistry, 1982, University of Idaho
Graduate Training in Biochemistry, 1974-77, Clemson University
B.S. Pre-medicine, 1974, Clemson University

EXPERIENCE:

In Educational Institutions Since Receipt of Bachelor's Degree:

Research and Teaching:

Professor of Postharvest Physiology, 2002-present, Washington State University. Principal duties include research (65%) directed toward investigations of postharvest phenomena in perishable commodities; undergraduate and graduate instruction (35%).

Associate Professor of Postharvest Physiology, 1995-2002, Washington State University. Research (40%); undergraduate and graduate instruction (60%).

Associate Professor of Postharvest Physiology, 1993-1995, University of Idaho.

Assistant Professor of Postharvest Physiology, 1988-1993, University of Idaho.

Visiting Assistant Professor and Visiting Horticulturist, Washington State University, 1990-1995.

Postdoctoral Research Associate in Plant Biochemistry, 1983-85, Washington State University. Principal duties included biochemical research on polyol-synthesizing plants.

Postdoctoral Research Associate in Atmospheric Analytical Chemistry, 1983, University of Idaho.

Research duties on development and validation of analytical methods to measure trace amounts of atmospheric sulfur compounds.

Postdoctoral Research Associate in Food Chemistry, 1981-82, University of Idaho. Research on development and validation of instrumental analytical methods for water-soluble vitamins in foods.

Graduate Research Assistant, 1979-81, University of Idaho

Graduate Instructional Assistant, 1977-79, University of Idaho

Graduate Teaching Assistant, 1975-77, Clemson University

Other Employment:

Research Chemist, Tree Fruit Research Laboratory, 1987-88, USDA/ARS Wenatchee, WA. Duties involved design, conceptualization, and implementation of biochemical research on stored apples, pears and cherries.

Research Associate - Postharvest Physiology, 1985-87, USDA/ARS Wenatchee, WA

Courses taught:

Washington State University:

Horticulture 435/535 Chemistry and Biochemistry of Fruits and Wine, Spring 2003
Horticulture 509-510 Graduate Seminar, Spring Semester 1996, Spring / Fall 2002-present
Horticulture 503, Advanced topics in Horticulture, Fall Semester 1995, 1996, Spring 1999, 2001, 2002
Horticulture 418/518, Postharvest Biology and Technology (Washington State University) Fall Semester 1993-present
Horticulture 311, Pomology Fall Semester 1989.
Other contact hours in Horticulture 700 and 800, Dissertation/Thesis Research

University of Idaho:

Plant Science 102, Introduction to Plant Science 3 credits, Fall Semester 1990, 1991
Plant Science/Forestry 432, Tree Physiology 3 credits, Team taught with with Dr. John Marshall, Spring Semester 1993, 1995.
Plant Science 461, Pomology/Tree Fruit Production Techniques 3 credits, Alternate Fall Semesters 1988, 1990, 1992, 1994.
Plant Science ID475, Postharvest Pathology 3 credits, Alternate Spring Semesters, 1989, 1991, 1993, 1995.
Plant Science 480, Field Trip 1 credit, 1990-1994
Pruning Trees and Shrubs, UI Continuing Education Enrichment course 1 session Summer 1989.
Other contact hours involving Plant Science 500 and 600, Dissertation/Thesis Research

Guest Lectures in:

WSU FSHN 510, Advanced Food Chemistry, "Volatiles Analysis" 2 lectures 1997, 1999
WSU Horticulture 201 "Harvesting Crops" 1989, 1991, 1993, 1994, 1995, 1996, 1997, "Pomology" 2001
UI Food Science 101 "Flavor and Aroma", 1998, 1999, 2000, 2001
UI Plant Science 102 "Harvesting, Handling and Storage of Crops", and "Fruit Crops" 1988, 1989, 1992, 1993
WSU Hort 418, Postharvest Physiology. "Structure and Composition Changes of Perishable Crops" 5 lectures 1989
UI Pl Sc 305 "Postharvest Pathology of Perishable Crops" 1988, 1989, 1990, 1991, 1992, 1993
UI Bioch 380 "Fatty Acid Metabolism" 1988
UI Pl Sc 504 Analytical Methods for Phytopathological Research - "Chromatographic Methods" 1992, 1994.

Short courses:

Taught portions and conducted a one-week field tour in a PIP-Sponsored shortcourse "Cold storage management of perishable crops" Summer 1993.

Taught portions and conducted a one-week field tour in a PIP-sponsored shortcourse for NIS (formerly USSR) nationals concerning postharvest handling, transportation and marketing of perishable agricultural products, Fall 1993.

Taught portions and conducted a one-week field tour in a PIP-sponsored shortcourse For Indonesian Agriculture Professionals concerning postharvest handling, transportation and marketing of perishable agricultural products, Spring 1994.

Graduate students under my direction:

Degree programs completed

Washington State University

Greg Hoffman MS Horticulture, 2004

Thesis: Effect of Ethylene Antagonists on Storage Longevity and Quality of Cut Peony Flowers

Todd Edgington MS Horticulture, 2003
Thesis: Packaging for shelf-life extension of fresh raspberries.

Guiping Lu, PhD Food Science, 2002
Dissertation: Identification of sources of Geosmin, a principal flavor component of table beets. Co-advisor with Dr. C.G. Edwards

Kyung-Mi Yun, MS Horticulture, 2002
Thesis: Determination of optimal conditions for pea sprout production and extension of shelf-life in pea and mung bean sprout.

David Rudell MS Horticulture, 2000
Thesis: Studies of apple fruit ripening and aroma volatile biosynthesis for improving harvest timing and post-storage quality.

Chris Hawk, MS Food Science, 2000
Thesis: Shelf-life extension of fresh raspberries by bio-control methods and modified atmosphere packaging. Co-Advisor with Dr. C.G. Edwards.

Eric T. Johnson, Ph. D. Horticulture, 1997
Dissertation: Expression of ethylene synthesis genes in 'd' Anjou' pears.

Xuetong Fan, Ph. D. Horticulture 1996
Dissertation: Role of jasmonates in fruit ripening Co-Advisor with J.P. Mattheis

University of Idaho

Margo M. Haines, Ph.D. Plant Science 2000
Thesis: Molecular studies on the role of ethylene in potato (*Solanum tuberosum* L.) tuber dormancy. Co-Advisor at UI with Dr. P. Berger

Timothy W. Miller, Ph.D. Plant Science 1995
Dissertation: Comparative studies of the relationship between aroma volatile biogenesis and anthocyanin synthesis in 'Delicious' apples.

Randy R. Lee, Ph.D. Plant Science 1994
Dissertation: Interrelationships between fruit characteristics, flowering habit, xylary cytokinin levels, and hydrogen cyanamide applications in 'Rome Beauty' apples (*Malus domestica* Borkh.).

Victorine Alleyne, Ph.D. Plant Science 1992
Dissertation: Changes in Biochemical and Volatile Composition of Red Raspberry (*Rubus idaeus* L.) in Relation to Cultural Practices, Maturity, and Storage

M.R. Kodandaram, M.S. Plant Science 1992
Thesis: Measurement of Postharvest Quality Changes in Relation to Disease Suppression Treatments of Sugar Snap Peas (*Pisum sativum* var. *saccharatum*)

Degree Programs In Progress:

Ines Muller PhD. Horticulture, Research area: Postharvest physiology of apples.

Paul G. Levesque PhD. Horticulture, Research Area: Postharvest physiology of cherries.

David Rudell PhD. Horticulture, Research Area: In vivo DPA reactions on stored apple surfaces.

Member of Graduate Committees:

completed:

- 17 MS Plant Science, Soil Science or Horticulture
- 1 MS Bacteriology
- 2 MS Biochemistry
- 2 Ph. D. Biological Systems Engineering
- 4 MS Chemistry
- 3 Ph.D Chemistry
- 3 MS Forestry
- 2 Ph. D. Forestry
- 3 MS Food Science
- 3 Ph.D Horticulture
- 1 MS Plant Pathology
- 1 MS Plant Physiology
- 8 Ph.D Plant Science
- 2 Ph. D. Plant Pathology

in progress:

- 1 Ph.D Horticulture
- 4 Ph. D. Food Science
- 1 Ph.D. Forestry/NRS
- 3 MS Horticulture
- 2 MS Food Science

Undergraduate Advising:

- 4 Students 2002-2003
- 4 Students 2001-2002
- 6 Students 2000-2001
- 8 Students 1999-2000
- 12 Students 1998-1999
- 10 Students 1997-1998
- 6 Students 1996-1997
- 3 Students 1995-1996
- 12 students 1993-1994
- Co-advisor of University of Idaho Plant and Soil Science Club 1990-1995

Miscellaneous:

Moscow High School Science Intern, Spring 1991

Regional Math and Science Students(2) sponsor in Summer program 1992, 1993, 1994

Conducted two different "hands-on" workshops involving elementary school students with flavor chemicals. Each workshop served 45-60 students for three hours, Summer and Fall 1994.

Entertained groups of High School students in our laboratories as part of the Agriscience Leadership Experience program sponsored by CAHE Fall 1996, 1997, 1998

Gave a tour of the Tukey Horticulture research farm and facilities for the combined second grade classes of Lena Whitmore Elementary School, Moscow Fall 1996

Gave a presentation about the Washington apple industry to the third grade classes of Lena Whitmore Elementary School, Moscow, October 1998

Consulting:

Member of NE-103 (Postharvest Physiology of Fruits) Regional Project Technical Advisory Committee, 1987-present, Secretary 1994-1995, Chairman 1996-1997
Member of WRCC-68 (International Marketing of Western U.S. Agricultural Products) Secretary 1990, Chairman 1991
Consultant to United Fresh Fruit and Vegetable Association, 1987
External Reviewer for NE-103 Technical Advisory Committee, 1986
External Reviewer for proposals for USDA NRICGP programs, USDA ARS CRIS project proposals, Midwest Plant Biotechnology Consortium, NSF Atmospheric Chemistry, USDA-NRI Competitive Grants, NSERC (Canada) Plant Biology, USDA-BARD Program.
Tree Top Inc. Compositional Changes During Apple Ripening and Development
Idaho Fish and Game Department, Wildlife depredation of orchard land
External thesis examiner, University of Western Sydney, Hawkesbury, Australia
External thesis examiner, University of Alberta, Edmonton Alberta, Canada
External thesis examiner, University of the West Indies, Trinidad-Tobago

Editorial responsibilities:

Editor, Proceedings of the Fifth International Controlled-Atmosphere Research Conference, 1989. Two Volumes, 374 pages.

Manuscript referee for J. Amer. Soc. Hort. Sci., J. Food Sci., Postharvest Biol. Technol., J. Idaho Acad. Sci., J. Prod. Agric., J. Agric. Food Chem, Amer. Soc. Agr. Eng. J. Plant Physiol.

Honorary And Professional Organizations:

American Association for the Advancement of Science
American Chemical Society, Washington-Idaho Border Section Chairman-Elect 1996, Chairman 1997
American Society for Horticultural Science
American Society of Plant Physiologists 1985-1998
International Dwarf Fruit Tree Association 1988-1995
Sigma Xi, UI chapter Vice President 1989, chapter President 1990, 1991
Phi Sigma (Honorary Society)
Washington State Horticultural Association
Idaho State Horticultural Society 1988-1995

Committees:

National:

Postharvest Working Group, American Society for Horticultural Science
Food Quality and Nutrition Working Group, ASHS

Regional:

NE-1018 "Postharvest Physiology of Fruits" Technical Advisor 2004-present
NE-103 "Postharvest Physiology of Fruits" Technical Advisor 1987-2003 and State Leader 1988-1995
WRCC-68 " International Marketing of Western U.S. Agricultural Products" Secretary 1989, 1990
Chairman 1991
Chairman of Processing Technical Working Group, Northwest Center for Small Fruits Research, 1997, ex-officio 1998

Washington State University

Undergraduate Academic Reinstatement Advising Committee
Department Liaison for WSU Four Year Degree contract
Tier 1 Timed writing portfolio reader, WSU Writing assessment program
Tier 2 Writing portfolio evaluator, WSU Writing assessment program
Critical Thinking Writing Evaluator, WSU Writing assessment program

Washington State University College of Agriculture and Home Economics:

Department Representative for CAHE Plant biotechnology curriculum committee
Vision Statement group for new Plant Molecular Sciences Facility
Washington Viticulture and Enology Education Consortium Academic Program Committee
CAHE Design/Planning team for Postharvest, and Graduate Plant Science Education(2)

Washington State University Departmental:

Chairman, equipment committee 1995-present
Farm committee 1998-present
Faculty Advisory committee 1995-1998
Graduate Steering committee 1997-present
Scholarship committee 2000-present
Potato Postharvest Physiologist Search committee 1998
Stone Fruit Physiologist Search committee 2000, 2003
Plant Propagation Faculty Search committee 2000(suspended)
Viticulture Faculty Search committee, Chair 2003

University of Idaho:

Faculty Council 1992-1995

University of Idaho College of Agriculture:

Commencement Committee, 1991
Food QA/Analytical Chemist Search Committee 1990

University of Idaho Departmental:

Pomology Search Committee (Chair) 1990
Chairman of the PSES Curriculum Reform Committee 1988
Graduate Student Progress 1991-1995
Forage Physiologist Search Committee 1990
Grass Molecular Physiologist Search Committee 1991
Field Day Food Service 1989, 1991
D.L. Barney 3 year Review 1991
R. Tripepi Tenure Review Committee 1989, 1990
Sandpoint Research Associate Selection Committee 1990
Tenure Recommendation and Performance Review Committee, Agricultural Economics and Rural Sociology. 1991
D.L. Barney Tenure Review Committee 1993
Tenure/Promotions Procedures Review, 1993
J. Griffin 3 year Review Committee, 1994
Chemical Ecologist Search Committee 1994-1995
Major Instrument Maintenance/Replacement committee 1994-1995

Publications:

Dissertation:

Fellman, J.K. 1982. Comparative Studies on the Mode of Action of Chemically Induced Inhibition of Sclerotium formation in *Sclerotinia sclerotiorum* and *Sclerotium rolfsii*. Ph. D Dissertation under the direction of Dr. D. Le Tourneau.

Journal (Refereed): (* indicates substantial intellectual/resource contribution)

1. Haines, M.M., Shiel, P.J., Fellman, J.K., and Berger, P.H. 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.
2. Warren, J.M., Bassman, J.H., Fellman, J.K., Eigenbrode, S.D., and Mattinson, D.S. 2003. UV-B radiation alters phenolic profiles in *Populus trichocarpa*, with implications for Chrysomelid herbivory. *Tree Physiology* 23:527-536*
3. Fellman, J.K., Rudell, D. R., Mattinson, D.S., and Mattheis, J.P. 2003. Relationship of harvest maturity to flavor regeneration after CA storage of 'Delicious' apples. *Postharvest Biol. Technol.* 27:39-51.*
4. Lu, G.; Edwards, C.G.; Fellman, J.K., Mattinson, D.S., and Navazio, J. 2003. Biosynthetic origin of geosmin in red beets (*Beta vulgaris* L.). *Journal of agricultural and food chemistry.* 51:1026-1029.*
5. Lu, G.; Edwards, C.G.; Fellman, J.K., Mattinson, D.S., and Navazio, J. 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.*
6. Warren, J.M., J.H. Bassman, D.S. Mattinson, J.K. Fellman, G.E. Edwards, R. Robberecht 2002 Alteration of foliar flavonoid chemistry induced by enhanced UV-B radiation in field-grown *Pinus ponderosa*, *Quercus rubra*, and *Pseudotsuga menziesii*. *J. Photochem. and Photobiol. B: Biology* 66:125-133*
7. Rudell, D.R. ; Mattheis, J.P. ; Fan, X. ; Fellman, J.K. 2002. Methyl jasmonate enhances anthocyanin accumulation and modified production of phenolics and pigments in 'Fuji' apples. *J. Amer. Soc. Hort. Sci.* 127: 435-441.
8. Lee, S.Y. ; Yun, K.M. ; Fellman, J. ; Kang, D.H. 2002 Inhibition of *Salmonella typhimurium* and *Listeria monocytogenes* in mung bean sprouts by chemical treatment. *Journal of food protection.* 65: 1088-1092.
9. Rudell, D. R., D.S. Mattinson, S.G. Wyllie, and J.K. Fellman 2002. Investigations of aroma volatile biosynthesis under anoxic conditions and in different tissues of 'Redchief Delicious' apple fruit (*Malus domestica* Borkh.) *J. Agr. Food Chem.* 50:2627-2632.*
10. Baritelle, A.L., G.M. Hyde, J.K. Fellman and J.Varith 2001.Using 1-MCP to inhibit the influence of ripening on impact properties of pear and apple tissue. *Postharvest Biol.Technol.* 23:153-160*
11. Rudell, D.R., Mattinson, D.S., Mattheis, J.P. and Fellman, J.K. 2000. The progression of ethylene production and respiration in the tissues of ripening 'Fuji' apple fruit. *HortScience* 35:1300-1303.*

12. Wyllie, S.G., and J.K. Fellman. 2000. Formation of branched-chain esters in bananas (*Musa sapientum* L.). *J. Agr. Food Chem.* 48:3493-3496.*
13. Fellman, J.K., Miller, T.W., Mattinson, D.S., and Mattheis, J.P. 2000. Factors that influence biosynthesis of volatile flavor compounds in apple fruits. *HortScience* 35:1026-1033.*
14. Holley, S.L., C.G. Edwards, J.H. Thorngate, J.K. Fellman, D.S. Mattinson, E.J. Sorensen, and R.H. Dougherty. 2000. Chemical characterization of different lines of *Daucus carota* L. roots. *J. Food Qual.* 23:487-502*
15. Mattheis, J., and J.K. Fellman. 2000. Impacts of modified atmosphere packaging and controlled atmospheres on aroma, flavor, and quality of horticultural commodities. *HortTechnology* 10: 507-510.*
16. Eberlein, C.V., Guttieri, M.J., Fellman, J.K., Mallory-Smith, C.A., Thill, D.C., Baerg, R.J. and Berger, P.H. 1999. Physiological effects of mutation for resistance in a near isonuclear ALS-inhibitor resistant lactuca sativa line. *Weed Science* 47:383-392.*
17. Feng, H., Tang, J., Mattinson, D.S. and Fellman, J.K. 1999. Microwave and spouted-bed drying of blueberries: effect of drying and pretreatment methods on physical properties and retention of flavor volatiles. *J. Food Processing and Preservation* 23(2):463-479.*
18. Mattheis, J.P., Fellman, J.K. 1999. Pre-harvest factors influencing postharvest flavor of fresh fruit and vegetables. *Postharvest Biol. Technol.* 15:237-242.
19. Fan, X., J.P. Mattheis, and J.K. Fellman 1998. A role for jasmonates in climacteric fruit ripening. *Planta* 204:444-449**
20. Mattheis, J.P. Buchanan, D.A., and Fellman, J.K. 1998. Volatiles emitted by 'Royal Gala' apples following sequential atmosphere storage. *Acta Hort.* 464:201-205.*
21. Miller, T.W. Fellman, J.K. Mattheis, J.P. Mattinson, D.S. 1998. Factors that influence volatile ester biosynthesis in 'Delicious' apples. *Acta Hort.* 464:195-200.*
22. Mattheis, J.P. Buchanan, D.A. Fellman, J.K. 1998. Volatile compounds emitted by 'Gala' apples following dynamic atmosphere storage. *J. Amer. Soc. Hort. Sci.* 123: 426-432.*
23. Fan, X.T. Mattheis, J.P. Fellman, J.K. 1998. Responses of apples to postharvest jasmonate treatments. *J. Amer. Soc. Hort. Sci.* 123: 421-425.*
24. Mattheis, J.P., D.A. Buchanan and J.K. Fellman. 1997. Volatile constituents of bing sweet cherry fruit following controlled atmosphere storage. *J. Agric. Food Chem.* 45:212-216.*
25. Fan, X., J.P. Mattheis, J.K. Fellman and M.E. Patterson. 1997. Effect of methyl jasmonate on ethylene and volatile production by Summerred apples depends on fruit developmental stage. *J. Agric. Food Chem.* 45:208-211.*
26. Yeoung, Y.-R., R.R. Lee, and J.K. Fellman. 1996. Blooming pattern of lateral and spur terminal buds in tip-bearing apple cultivars. *J.Korean Soc. Hort. Sci.* 37: 77-80.*
27. Fan, X., J.P. Mattheis, and J. K. Fellman. 1996. Inhibition of apple fruit ACC oxidase activity and respiration by acetylsalicylic acid. *J. Plant Physiol.* 149:469-471.*
28. Fan, X., J.P. Mattheis, M.E. Patterson and J.K. Fellman. 1995. Changes in amylose and starch content in 'Fuji' apples during maturation. *HortScience* 30:104-105.*
29. Mattheis, J.P., D.A. Buchanan and J.K. Fellman. 1995. Volatile compound production by 'Bisbee Delicious' apples after sequential atmosphere storage. *J. Agric. Food Chem.* 43:194-199.*

30. Mikitzel, L.J., and J.K. Fellman 1994. Quality changes in sweet onions during storage at room temperature. *J. Food Qual.* 17:431-445.*
31. Fallahi, E., B.R. Simons, J.K. Fellman, M.A. Longstroth, and W.M. Colt. 1994. Growth, yield, harvest and storage quality of Delicious apple strains. *J. Amer. Soc. Hort. Sci.* 119:389-395.
32. Fellman, J.K., D.S. Mattinson, B.C. Bostick, J.P. Mattheis, and M.E. Patterson. 1993. Ester biosynthesis in 'Rome' apples subjected to low-oxygen atmospheres. *Postharvest Biol. Technol.* 3:201-214.*
33. Robbins, J. and J.K. Fellman. 1993. Postharvest physiology, storage, and handling of red raspberry. *Postharvest News and Information* 4:53N-59N.*
34. Fallahi, E., B.R. Simons, J.K. Fellman, and W.M. Colt. 1992. Use of Hydrogen Cyanamide for Apple and Plum Thinning. *Plant Growth Regul.* 11:435-439.
35. Mattheis, J.P., D.A. Buchanan and J.K. Fellman. 1992. Volatile Compounds emitted by Sweet Cherries (*Prunus avium* Cv. Bing) during Fruit Development and Ripening. *J. Agric. Food Chem.* 40:471-474.*
36. Mattheis, J.P., J.K. Fellman, P.M. Chen and M.E. Patterson. 1991. Change in Volatiles during Physiological Development of 'Delicious' Apple Fruit. *J. Agric. Food Chem.* 39:1902-1906.*
37. Mattheis, J.P., D.A. Buchanan and J.K. Fellman. 1991. Change in Apple Fruit Volatiles after Storage In Atmospheres Inducing Anaerobic Metabolism. *J. Agric. Food Chem.* 39:1602-1605.*
38. Shetty, K.K., R.B. Dwelle and J.K. Fellman. 1991. Quality of Individually Film-Wrapped Potatoes. *Amer. Potato Jour.* 69:275-286.*
39. Shetty, K.K., R.B. Dwelle, J.K. Fellman and M.E. Patterson. 1991. Blackspot Injury of Film-wrapped Potatoes in Relation to Bruising, Water Relations and Respiratory Gases. *Potato Res.* 34:253-260.*
40. Zeller J.K., F.E. Larsen, S.S. Higgins, J.T. Raese and J.K. Fellman. 1991. Rootstock Effect on Response of Potted 'Smoothie' Golden Delicious Apples to Soil Applied Triazole Growth Inhibitors II: Mineral Nutrition and Carbohydrate Status. *Scientia Hort.* 46:75-88.*
41. Drake, S.R., H.R. Moffitt, J.K. Fellman and C.R. Sell. 1988. Apple Quality as Influenced by Fumigation with Methyl Bromide. *J. Food Sci* 53:1710-1712.*
42. Drake, S.R., J.K. Fellman and J.W. Nelson. 1988. Quality of Apple Fruit in Rigid Film Containers. *J. Food Qual.* 11:183-191.*
43. Davis, J.M., J.K. Fellman, and W.H. Loescher. 1988. Biosynthesis of sucrose and mannitol as a function of leaf age in celery (*Apium graveolens* L.). *Plant Physiol.* 86:129-133.*
44. Drake, S.R., J.K. Fellman, and E.M. Kupferman. 1988. 'Bing' sweet cherry (*Prunus avium* L.) quality as influenced by wax coatings and storage temperature. *J. Food Science* 53:124-126.*
45. Drake, S.R., J.K. Fellman, F.E. Larsen, and S.S. Higgins. 1988. Maturity, storage quality, carbohydrate and mineral content of 'Goldspur' apples as influenced by rootstock. *J. Amer. Soc. Hort. Sci.* 113:949-952.*
46. Fellman, J.K., and W.H. Loescher. 1987. Comparative studies of sucrose and mannitol utilization in celery (*Apium graveolens* L.). *Physiol. Plant.* 69:337-341.*
47. Drake, S.R., and J.K. Fellman. 1987. Indicators of maturity and storage quality of 'Rainier' sweet cherry. *HortScience* 22:283-285.*

48. Drake, S.R., J.K. Fellman, and J.W. Nelson. 1987. Postharvest use of sucrose ester coating for extending the shelf-life of stored 'Golden Delicious' apples. *J. Food Science* 52:1283-1285.*
49. Augustin, J., C. Cole, J. K. Fellman, and P. Tassinari. 1983. Nutrient content of sprouted wheat and selected legumes. *Cereal Foods World* 28:358-361.*
50. Fellman, J.K., D. LeTourneau, and D.L. Stiers. 1983. Effect of some carboximide fungicides on growth and sclerotial formation of *Sclerotium rolfsii*. *Trans. Br. Mycol. Soc.* 80:170-172.*
51. Fellman, J.K., W. Artz, P. Tassinari, C. Cole, and J. Augustin. 1982. Simultaneous determination of thiamin and riboflavin in selected foods by high-performance liquid chromatography. *J. Food Science* 47:2048-2050.*
52. Augustin, J., P. Tassinari, J.K. Fellman, and C. Cole. 1982. B vitamin content of selected cereals and baked products. *Cereal Foods World* 27:159-162.*
53. Stiers, D.L., J. K. Fellman, and D. LeTourneau. 1980. The effects of triadimefon on growth, sclerotial formation, and ultrastructure of *Sclerotinia sclerotiorum*. *Environ. and Exp. Bot.* 20:181-189.*

Symposia and Proceedings:

1. Haines, M.M., Shiel, P.J., Fellman, J.K., and Berger, P.H. 2003. Altering ethylene reception in potato results in changes on growth, development, dormancy and response to biotic and abiotic stress. in M. Vendrell, et al.(eds) *Biology and Biotechnology of the Plant Hormone Ethylene III*, IOS Press Amsterdam pp.237-239
2. Moore, P. P., C. Burrows, D.S. Mattinson, and J.K. Fellman 2002. Genotype X environment variation in raspberry fruit aroma volatiles. *Acta. Hort.*585:511-516
3. Andrews, P.K., J.K. Fellman, J.D. Glover, and J.P. Reganold 2001. Soil and plant mineral nutrition and fruit quality under organic, conventional, and integrated apple production systems in Washington State. *Acta Hort.* 564:291-297
4. Fellman, J.K. 2000. Flavor chemistry and "taste-life" of Red Delicious Apples. *Proc. Mich. St. Univ. CA and Warehouse Storage Clinic* 4:85.
5. Fellman, J.K. 2000. Waxing of Apples. *Proc. Mich. St. Univ. CA and Warehouse Storage Clinic* 4:69.
6. Fellman, J.K. 1999. Chemical and sensory correlations of flavor components in red raspberries. 1998 *Proc. Northwest Ctr. Small Fruits Res* 7:
7. Fellman, John K, C. Hawk, D.S. Mattinson, C. Edwards. 1999 Packaging for Shelf-Life Extension of Fresh Raspberries. *Proc. Northwest Ctr. Small Fruits Res* 7:
8. Fellman, J.K., J.H. Thorngate, and D.L. Barney 1998. Identification of western huckleberry flavor components. 1997 *Proc. Northwest Ctr. Small Fruits Res.* 6:62
9. Fellman, J.K. 1998. Chemical and sensory correlations of flavor components in red raspberries. 1997 *Proc. Northwest Ctr. Small Fruits Res.* 6:63
10. Sitton, J.W., J.K. Fellman, M.E. Patterson, and R.P. Cavalieri 1996. Potpourri of apple diseases, disorders, and storage studies. *Proc. 11 Ann. Tree Fruit Postharvest Conf.*
11. Fellman, J. K. 1996. Pome fruit quality in relation to environmental stresses. *Proc. 1996 Pacific Northwest Fruit School.*

12. Fallahi, E., and J.K. Fellman. 1996. Sufficient nitrogen for optimum fruit quality and safe environment in 'Delicious' and 'Fuji' apples. Proc. Utah State Hort. Assn.
13. Fellman, J.K. 1995. Better Tasting Apples. Proc. Mich. St. Univ. CA and Warehouse Storage Clinic 3: 47
14. Fellman, J.K. 1995. New information on CA storage of "Rome" apples. Proc. Mich. St. Univ. CA and Warehouse Storage Clinic 3:73
15. Fellman, J. K., J. L. Thorngate, and P. Moore. 1995. Chemical and sensory correlations of flavor components in red raspberries. Proc. Northwest Ctr. Small Fruits Res. 4:71.
16. Fellman, J.K. and J.P. Mattheis 1995. Ester biosynthesis in relation to harvest maturity and controlled-atmosphere storage of apples. in M. Leahy and R. Rouseff, eds. Fruit Flavors, Biogenesis, characterization, and Authentication, ACS symposium series 596, American Chemical Society, Washington DC.
17. Fellman, J.K., J.P. Mattheis, M.E. Patterson, D.S. Mattinson, B.C. Bostick. 1993. Study of ester biosynthesis in relation to harvest maturity and controlled-atmosphere storage of apples (*Malus domestica* Borkh.) Proc. 6th International Controlled Atmosphere Research Conference, NRAES-71 Ithaca NY Vol.2 pp 500-507.
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5. J.K. Fellman and J. P. Mattheis. Study of Non-Ethylene Volatile Organic Molecules in assessing Physiological Status of Fruits. American Society for Horticultural Science National Meeting, Tulsa OK 1990

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2. Fellman J. K, D. R. Rudell, D. S. Mattinson, and J.P.Mattheis 2001."Harvest Maturity Relationship to Flavor Regeneration after CA storage of 'Delicious' Apples" CA 2001 7th International conference on CA storage, Rotterdam, Netherlands, July 8-12.
3. Varith, J., G. M. Hyde, A. L. Baritelle, J. K. Fellman, and T. Sattabongkot. 2001. "Non-contact bruise detection in apples by thermal imaging." 8th International Congress on Engineering and Food, Puebla, Mexico, April 9-13.
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18. Shetty, K., G.E. Kleinkopf, J.K. Fellman, P. Berger, and R. B. Dwelle. 1992. A Strategy for the Study of Potato Bud Proteins using Two-Dimensional Electrophoresis with the Phastsystem. presented at the Potato Association of America annual meeting, Fredrickton, Prince Edward Island, July.
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4. Rudell, D.R., S. Mattinson, J.P. Mattheis, and J.K. Fellman 1999. Ester biosynthesis and alcohol acetyl transferase activity during ripening of "Delicious" apples (*Malus domestica* borkh.) Northwest Regional Meeting, American Chemical Society, Portland OR 20-23 June

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11. Fan, X., J. P. Mattheis, and J. K. Fellman. 1998. A role for jasmonates in climacteric fruit ripening. 53rd Annual Meeting of the Northwest Section of the American Chemical Society, Pasco WA
12. Miller, T.W. and J.K. Fellman 1998. Relationship between anthocyanin and ester biosynthesis in 'Delicious' apples (*Malus domestica* Borkh). 53rd Annual Meeting of the Northwest Section of the American Chemical Society, Pasco WA
13. Fellman, J.K., and L.J. Mikitel. 1992. Relationship between Sulfur Compounds and Pungency in Sweet Onions presented at the 47th Northwest Regional Meeting of the American Chemical Society, Missoula, MT June 17-19.
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16. Fellman, J.K. 1979. Effect of Phenylthiourea on the Fine Structure of the Plasma Membrane of *Sclerotinia sclerotiorum*. presented at the XXI Idaho Academy of Science Meeting, April.
17. Fellman, J.K., and J.M. Shively 1977. Isolation and Description of the Polyhedral Inclusion Bodies (Carboxysomes) from *Thiobacillus neapolitanus*. presented at the S.C. Academy of Science Meeting, March.

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1. Haines, M.M., Mattinson, D.S., Fellman, J.K. 2003. Superficial scald, farnesyl protein transferase, MAP kinases, ethylene, and farnesene in apples (*Malus domestica* Borkh.). Washington Tree Fruit Research Commission, July 24, 2004, Leavenworth, Washington.
2. Schrader, L.E.; Sun, J.; Faubion, D.; Fellman, J. 2003. Improving Fruit Finish in Apple. Report to Washington Tree Fruit Research Commission. Poster and oral report also were presented on January 6, 2003, at Penticton, British Columbia.
3. "Postharvest behaviour of Washington-Grown 'Fuji' apples. 16th Ann. Wash. Tree Fruit Postharvest Conference, Yakima WA, March 2000.
4. "Waxing of apples" MSU Controlled Atmosphere Storage Clinic, Clarksville MI, April 28, 2000 **invited presentation**
5. "Maintaining the taste-life of Red Delicious" MSU Controlled Atmosphere Storage Clinic, Clarksville MI, April 28, 2000. **invited presentation**
6. "Spin-trapping studies of apple scald" MSU Hort. Dept. Seminar, April 27, 2000. **invited presentation**
7. Presented Research Results to NE-103 Technical Committee, Leavenworth, WA July 2000.
8. Presented Research Results to NE-103 Technical Committee, Lunenburg Nova Scotia July, 1999
9. D. Rudell, S. Mattinson, J.K. Fellman 1999. "Red Delicious Harvest Maturity and its Effects on Post-Storage Flavor" Washington State Horticultural Association Annual Meeting December 6-8, 1999
10. Presented Research Results to NE-103 Technical Committee, July, 1998
11. "Physiological and biochemical changes in apple (pome fruits) during maturation, ripening and subsequent long-term storage" at the Apple biotechnology workshop sponsored by Agritope Inc., Portland OR. November, 1998
12. Presented Research Results to NE-103 Technical Committee, July, 1997
13. "Modified Atmosphere Packing for Fresh Produce" at the annual meeting of the Western Washington Horticultural Association, Seattle, January 1998.
14. J.K. Fellman 1997. Physiology of Watercore. 13th Ann. Wash. Tree Fruit Postharvest Conference, Wenatchee, March 11-12.
15. Presented Research Results to NE-103 Technical Committee, July, 1996
16. J.K. Fellman 1996. Fundamental Postharvest Physiology. 12th Ann. Wash. Tree Fruit Postharvest Conference, Yakima, March 11-12
17. J.K. Fellman 1996. The Effect of CA on apple flavor. 12th Ann. Wash. Tree Fruit Postharvest Conference, Yakima, March 11-12
18. Presented Research Results to NE-103 Technical Committee, July, 1995

19. "Flavor biochemistry of Apples" MSU Hort. Dept. Seminar, April 1995. **invited presentation**
20. "Better Tasting Apples" MSU Controlled Atmosphere Storage Clinic, Clarksville MI, April, 1995 **invited presentation**
21. "New information on CA storage of 'Romes'" MSU Controlled Atmosphere Storage Clinic, Clarksville MI, April, 1995 **invited presentation**
22. Onion Storage Physiology. Panel presentation at the Pacific Northwest Vegetable Association Annual Meeting, Pasco WA, December 8, 1994.
23. Heritability of flavor components in red raspberries (*Rubus idaeus* L.) Presentation at the Northwest Small Fruit Research Center Annual Conference, Portland OR, November 30, 1994.
24. Biochemical approaches to postharvest problems. **Invited presentation** at the WSU Tree Fruit Research and Extension Center, Wenatchee, WA September 30, 1994.
25. Presented Research Results to NE-103 Technical Committee, July 8-9, 1994
26. Clement, S.L., J. Fellman, F. Muehlbauer, and R. Hannan. 1994. Forward-looking approaches for managing insect pests of dry peas. Poster presentation at the Pacific branch of the entomological Society of America, Sparks NV June 20-23 1994.
27. Better-Tasting Apples. **Invited presentation** to Okanagan Valley Grower/Fieldmen's Association Monthly Meeting, January 6, 1994.
28. Flavor Biochemistry of Apples. **Invited presentation** to Scientific Staff at the Agriculture Canada Research Station, Summerland BC, Canada, January 6, 1994.
29. Miller, T., and J.K. Fellman. Light penetration affects color and flavor in red Delicious apples. Washington State Horticultural Association Annual Meeting, Wenatchee, WA, December 6-8, 1993.
30. Lee, R., E. Fallahi, and J.K. Fellman. Flower bud position affects time of flowering and fruit quality in 'Rome' apple trees. Washington State Horticultural Association Annual Meeting, Wenatchee, WA, December 6-8, 1993.
31. Fellman, J.K., and P. Moore. Preliminary studies on heritability of flavor components in red raspberries (*Rubus idaeus* L.). Presentation at the Northwest Small Fruit Research Center Annual conference, Pasco, WA, November 17-18, 1993.
32. Presented Research Results to NE-103 Technical committee, Ithaca NY June 13-14, 1993.
33. Presented Research Results to NE-103 Technical committee, Wolfville Nova Scotia July 9-10, 1992.
34. Mattheis, J.P. and J.K. Fellman 1992. Delicious apple response to sequential controlled atmosphere storage. 8th Ann. Wash. Tree Fruit Postharvest Conference, Yakima, March 11-12.
35. Fellman, J.K., M.K. Thornton, L.J. Mikitzel, and M.E. Patterson. 1991. Sweet onion storage research in Idaho and Washington. Washington State Vegetable Association annual meeting, Yakima WA December 18, 1991.
36. Fellman, J.K., R. Lee, D.S. Mattinson, and M.E. Patterson. 1991. Proper harvest maturity and low oxygen storage maximize 'Rome' apple quality for long-term storage. Washington State Horticultural Association Wenatchee WA December 3, 1991.

37. Presented Research Results to NE-103 Technical committee, Beltsville, MD July 18, 1991
38. Flavor of red delicious strains. 7th Annual Washington Tree Fruit Postharvest Conference, Wenatchee March 27-28 1991.
39. Presented Research Results to NE-103 Technical Committee, June 6, 1990 Concord, NH.
40. Chair of panel discussion on technical barriers to International Trade WRCC-68, Portland, OR January 11, 1990.
41. Fellman, J.K., J.P. Mattheis, M.E. Patterson, and P.M. Chen. 1990. Volatile molecules within and around apples as a function of maturity. Washington State Horticultural Association annual convention Yakima, WA December 4, 1990.
42. Film Wrapping of Produce. Wash. State Vegetable Assn. Convention, Yakima, WA Dec. 11, 1989.
43. CA storage of onions. Central Washington Onion Workshop, WSU Cooperative Extension, Othello, WA Nov. 7, 1989.
44. Presented Research Results at annual NE-103 Postharvest Physiology Meeting Wenatchee WA June, 1989.
45. Postharvest research at the University of Idaho. oral presentation at the 94th Annual Meeting of the Idaho Horticulture Society, Boise, November, 1988.
46. Chemistry and physiology of waxes and other fruit coatings. oral presentation at the 94th Annual Meeting of the Idaho Horticulture Society, Boise, November, 1988.
47. Postharvest physiology programs at the University of Idaho. presentation to the Fall Meeting of the Northwest Frozen Food Industry Advisory Council, Moscow ID, November 1, 1988.
48. Cold drying and waxing. presented at the 3rd annual Warehouse Seminar, WSU Cooperative Extension, May 1987.

State/Local:

1. Banana Belt Horticulture Seminar, Lewiston ID "Postharvest handling of fruits", February 2002.
2. Asotin Master Gardners Training Seminar, Clarkston WA, "Tree fruit horticulture", February 2002.
3. Apple Scald Chemistry. WSU Horticulture Seminar Series, October 2001.
4. Spin-trapping of reactive compounds in apple: Determining the role of active oxygen species in the development of superficial scald WSU Plant physiology seminar series, October 2000.
5. Flavor biochemistry of apples. WSU Plant physiology seminar series, March 2000. **Invited presentation**
6. WSU Postharvest research presentation to Employees of the Washington Fruit and Produce Co. Yakima, January 1996.
7. Postharvest handling and storage...preserving quality in fruits and vegetables. Presentation at the WSU Cooperative Extension 1996 Crops for Small Acreages seminar. February 1996

8. Postharvest Research Update. Presentation at the annual Idaho State Horticultural Society Meeting, Nampa ID, November 22, 1994.
9. Biochemical approaches to postharvest problems. **Invited presentation** WSU Horticulture Seminar, Pullman, WA, September 29, 1994.
10. Flavor biochemistry of apples. WSU Botany Seminar, November 3, 1993. **Invited presentation.**
11. Fellman, J.K.. Flavor regeneration in CA stored apples. Idaho State Horticultural Society, Nampa, November 22-23, 1993.
12. Miller, T., and J.K. Fellman. Light penetration affects color and flavor in red Delicious apples. Idaho State Horticultural Society, Nampa, November 22-23, 1993.
13. Lee, R., E. Fallahi, and J.K. Fellman. Differences in 'Rome' apples related to flower position. Idaho State Horticultural Society, Nampa, November 22-23, 1993.
14. Fellman, J.K. Postharvest Handling. Idaho State Dept. of Agr. Farm Marketing Alternatives Conference, Nampa, November 6, 1993.
15. Flavor biochemistry of stored apples. UI Plant, Soil and Entomological Sciences Seminar October 30, 1992.
16. Fructan biosynthesis in *Lolium* sp. UI Plant Biology Journal Club, July 2, 1992
17. Harvest maturity and CA storage of 'Rome' apples. Idaho Fruit Growers Meeting, Caldwell, June 25, 1992.
18. Flavor chemistry and analysis of apples. UI Regional Center for Math and Science Program, June 24, 1992.
19. Flavor biochemistry of apples. invited speaker at UI Graduate Research Competition Awards Banquet, April 21, 1992.
20. Non-ethylene volatiles and fruit physiology. UI Forest Biology Colloquium March 13, 1992.
21. Flavor of red delicious strains. Annual Idaho State Horticulture Society Meeting Boise, November 25, 1991.
22. Non-ethylene Volatiles and fruit physiology. UI Plant/Soil Science Seminar February 13, 1991.
23. Update on postharvest research. Annual Idaho State Horticulture Society Meeting Boise, November 20, 1990.
24. Conducted a postharvest handling seminar for PIP-sponsored Chinese Study tour, October 19, 1990
25. Appeared on a public service talk show KZFN/KRPL radio, Moscow speaking about "Cold, Wet Weather and Horticultural Crops" June 10, 1990.
26. Conducted two workshops with "hands-on" demonstration in conjunction with the Master Berry grower's program at Sandpoint entitled: Harvesting, cooling, grading, storing, and shipping berries. June 23, 1990.
27. Participated in presentations for CSRS site visitation team concerning new facility proposal. April 1990.

28. Stand establishment and postharvest handling. to North Idaho Raspberry Growers, January 26, 1990.
29. Appeared on the public television show "Idaho Agriculture" Dec. 14, 1989 to talk about UI apple research.
30. Update on postharvest research. Annual Idaho State Horticulture Society Meeting, Boise, Nov 21, 1989.
31. Postharvest handling of produce. North Idaho Alternative Agriculture Workshop, Sandpoint, Nov. 3, 1989.
32. Chemistry and physiology of apple waxes. WSU Horticulture Seminar, Sept 11, 1989.
33. Harvest maturity and postharvest cooling. Tree Fruit Growers Meetings, Emmett, Homedale, Fruitland Aug 22,23,25, 1989.
34. Life after Alar. Idaho Horticulture Society Summer tour, Weiser, Jun. 29, 1989.
35. Plum CA storage. Tree Fruit working group, Caldwell, March 14, 1989.
36. Postharvest cooling of raspberries. North Idaho Berry Growers Assn. Sandpoint, March 7, 1989.
37. Tree fruit programs in Idaho. WSU Pomology Club, Feb. 17, 1989.
38. Chemistry of apple waxing. UI Chemistry Seminar, Jan. 26, 1989.
39. Alternatives: orchards, fruits and berry crops for northern Idaho. SCS Agronomy Training Workshop, Moscow, Jan. 19, 1989
40. Chemistry and physiology of apple fruit coatings. presentation to the PSES Spring Seminar series, April, 1988.
41. Chemistry and physiology of apple polishing. presentation to the UI Plant Biochemistry/Physiology Journal Club, April, 1988.

HATCH PROJECT

Fruit volatiles and postharvest biotechnology. CSRS-Hatch RRP IDA00974, 1993-1999. Postharvest Physiology of Fruits RRP WNP 0797, 1998-2003. WNP 0797, CSREES NE-1018

GRANTS AND CONTRACTS:

2003:

“Studies to improve postharvest technology related to asparagus harvest, handling, storage, and packaging”
USDA-CSREES Asparagus Special Grant \$45,000

“Apple Scald/Lenticel Disorder Chemistry” Washington State Tree Fruit Research Commission \$57,000

”Harvest quality monitoring of MCP treated apples in Washington” Smart Fresh, Inc. \$30,000

“Microbiology and Chemistry of Washington Wines” Washington Wine Advisory Committee(with C. Edwards and S.Spayd) \$40,000

“Application of Horticultural and natural soybean oil to apples” Washington State Tree Fruit Research Commission \$34,033

“Development of Modified Atmosphere Packaging to Maintain Fresh Saskatoon Flavor and Quality” Alberta Agricultural Research Institute(with R. Knowles, L. Knowles, and others) \$47,500

2002:

“Apple Scald Chemistry” Washington State Tree Fruit Research Commission \$77,000

“Studies to improve postharvest technology related to asparagus harvest, handling, storage, and packaging” USDA-CSREES Asparagus Special Grant \$45,000

“Application of Horticultural and natural soybean oil to apples” Washington State Tree Fruit Research Commission \$30,951

“Optimal storage and packaging for maximum shelf-life and quality maintenance in sprouted legumes” USDA-CSREES Cool Season Food Legume Program” \$10,000

“Development of Modified Atmosphere Packaging to Maintain Fresh Saskatoon Flavor and Quality” Alberta Agricultural Research Institute(with R. Knowles, L. Knowles, and others) \$47,500

“Identification of target and cull fruit pre- and post-harvest” Washington State Tree Fruit Research Commission(with C. Clary) \$19,916

“Development of Value-Added Dried Apple Products” Washington State Tree Fruit Research Commission(with C. Clary) \$11,943

2001:

“Packaging for shelf-life extension of fresh raspberries” Northwest Center for Small Fruits Research \$19,915

“Cabernet Sauvignon: Impact of Irrigation and Crop Load Strategies on Flavor and Phenolic Profiles of Grapes and Wines” Northwest Center for Small Fruits Research \$26,373 (with S.Spayd)

“Apple Scald Chemistry” Washington State Tree Fruit Research Commission \$70,000

“Studies to improve postharvest technology related to asparagus harvest, handling, storage and packaging” USDA-CSREES Special Grant \$43,675

“Optimal storage and packaging for maximum shelf-life and quality maintenance in sprouted legumes” Cool Season Food Legume Research Center \$13,700

“ Volatile chemistry of wines” Chateau Ste. Michelle \$6,000

2000:

“The biosynthetic origin of geosmin in red beets, the compound responsible for the earthy flavor.” Robert MacDonald Vegetable Seed Memorial Fund(with C.Edwards) \$7,500

“Biochemical markers for AVG Spray timing in apples” Valent Biosciences Inc. \$10,000

“LPE effects on ripening and storage of ‘Fuji’ apples” JP bioregulators, Inc.(with P.Andrews) \$10,000

“Apple Scald Chemistry” Washington State Tree Fruit Research Commission \$30,313

“Optimal storage and packaging for maximum shelf-life and quality maintenance in sprouted legumes” Cool Season Food Legume Research Center \$11,380

“Packaging for Shelf-Life Extension of Fresh Raspberries” Northwest Small Fruit Research Center(with C. Edwards) \$12,778

“Chemical and Sensory Correlations of Flavor Components in Red Raspberries” Northwest Small Fruit Research Center \$12,778

“Graduate Student Support for Raspberry Research” Northwest Small Fruit Research Center(with C. Edwards) \$42,120

Factors Influencing Wine and Grape Quality” Washington Wine Research Advisory Committee(with S. Spayd, C. Edwards, and G. Grove) \$95,825

“Impact of selected vitamins on alcoholic fermentations induced by Saccharomyces” Northwest Small Fruit Research Center (with C. Edwards) \$14,140

"Slow/stuck alcoholic fermentations in wines from the Pacific Northwest" Northwest Center for Small Fruit Research (with C.Edwards and B. Watson) \$5,396

“Microbiology and chemistry of Washington wines” Washington Wine Advisory Board(with C. Edwards and S. Spayd) \$56,502

"Equipment proposal" Washington Wine Advisory Committee (with C.Edwards and S. Spayd) \$8,700

1999:

“Studies to improve marketability of Red Delicious through retention of fresh flavor characteristics: relationships between harvest maturity, post-storage flavor regeneration and "taste life".” Washington State Tree Fruit Research Commission \$25,000

“Apple Scald Chemistry“ Washington State Tree Fruit Research Commission \$29,735

“Influence of AVG on apples” Abbott Laboratories \$5,000

“Packaging for Shelf-Life Extension of Fresh Raspberries” Northwest Small Fruit Research Center \$12,778

“Chemical and Sensory Correlations of Flavor Components in Red Raspberries” Northwest Small Fruit Research Center \$12,778

“Improved technology to enhance fresh market keeping quality of cranberries to allow for expanded domestic and international marketing “ WSU-IMPACT (with K. Patten) \$9,078

“Optimal storage and packaging for maximum shelf-life and quality maintenance in sprouted legumes” USA Dry Pea and Lentil Commission \$3,500

“Pear Skin Staining disorders” WSU-IMPACT \$ 9,085

“The biosynthetic origin of geosmin in red beets, the compound responsible for the earthy flavor.” Robert MacDonald Vegetable Seed Memorial Fund(with C.Edwards) \$7,500

“Impact of selected vitamins on alcoholic fermentations induced by Saccharomyces” Northwest Small Fruit Research Center (with C. Edwards) \$14,884

“Microbiology and chemistry of Washington wines” Washington Wine Advisory Board(with C. Edwards) \$ 61,218

1998:

“Geosmin in Beets” Robert MacDonald Vegetable Seed Memorial Fund(with C.Edwards) \$7,500

"Flavor Biochemistry of Apples" Washington State Tree Fruit Research Commission \$25,000

“Pear Skin Staining disorders” WSU-IMPACT \$ 9,085

“Development of a distance postharvest course” TAADA Program \$8,000

“Influence of AVG on apples” Abbott Laboratories \$5,000

1997:

“Flavor biochemistry of apples” Washington State Tree Fruit Research Commission \$17,000

“Flavor biochemistry of apples” Idaho Apple Commission \$1,500

“Chemical andSensory Correlations of Flavor Components in Red Raspberries” Northwest Small Fruit Research Center \$10,800

“Influence of AVG on apples” Abbott Laboratories \$5,000

1996:

"Flavor Biochemistry of Apples" Washington State Tree Fruit Research Commission \$30,000

"Flavor Biochemistry of Apples" Idaho Apple Commission \$1,500

“Chemical andSensory Correlations of Flavor Components in Red Raspberries” Northwest Small Fruit Research Center \$8,778

1995:

"Flavor Biochemistry of Apples" Washington State Tree Fruit Research Commission \$30,000

"Flavor Biochemistry of Apples" Idaho Apple Commission \$3,000

1994:

"Flavor Biochemistry of Apples" Washington State Tree Fruit Research Commission \$15,000

"Flavor Biochemistry of Apples" Idaho Apple Commission \$5,000

"Flavor Components of Red Raspberries" Northwest Small Fruit Research Center \$5,000

"Pea Odors to Control the Pea Weevil"(with S. Clement) \$20,000 USDA-CSRS Cool Season Food Legume Research Center

"Influence of rootstock and nitrogen fertilizer on 'Fuji' apple growth, yield, fruit color and quality at harvest"(With E. Fallahi and W. M. Colt) \$20,000 Washington State Tree Fruit Research Commission *

"Influence of nitrogen application timing on 'Delicious'apple growth, yield, fruit color, and quality" (With E. Fallahi and W. M. Colt) \$12,000 Washington State Tree Fruit Research Commission *

"Molecular Studies of Floral Initiation in Kentucky Bluegrass" (with J. Griffin) \$21,000 USDA-CSRS Grass Seed Cropping Systems program *

"Characterization of Fructan Levels during Floral Initiation in Kentucky Bluegrass" (with J. Griffin) \$5,778 UI Seed Grant Program *

"Biological Control of Fungal Wheat Pathogens" (with W. Chun) \$12,000 Idaho Wheat Commission *

1993:

"Flavor Biochemistry of Apples" Washington State Tree Fruit Research Commission \$10,000

"Flavor Biochemistry of Apples" Idaho Apple Commission \$4,000

"Flavor Components of Red Raspberries" Northwest Small Fruit Research Center \$5,000

"Flavor Biochemistry in New Cultivars of Apples" Okanagan Valley Tree Fruit Research Authority (Canada) \$10,000 CDN approximates \$7,900 US.

"Influence of rootstock and nitrogen fertilizer on 'Fuji' apple growth, yield, fruit color and quality at harvest"(With E. Fallahi and W. M. Colt) \$1,000 of \$10,000 total Washington State Tree Fruit Research Commission

"Influence of nitrogen application timing on 'Delicious'apple growth, yield, fruit color, and quality" (With E. Fallahi and W. M. Colt) \$1,500 of \$15,000 total Washington State Tree Fruit Research Commission

1992:

"Modulation of Fruit Ripening Genes During the Apple Climacteric" Idaho SBOE Specific Research Grants Program \$32,500

"Flavor Biochemistry of Apples" Idaho Apple Commission \$3115

Northwest Small Fruit Research Center, with E. Fallahi and D. Barney \$6,000 of \$14,338 total.

"Biological control of Fungal Wheat Pathogens" with W. Chun and G. Knudsen" Idaho Wheat Commission \$20,000.(\$6,000 spending authority)

"Biochemical and Molecular characterization of fungal antagonism by *Pseudomonas corrugata* and development of new biological agents" with W. Chun UI Research Office faculty seed grant FY 1993 \$6000 (\$2000 spending authority)

Idaho Potato Commission, postdoctoral position for K. Shetty. "Alternative methods for sprout control in potatoes" (Cooperative effort with G. Kleinkopf and R. Dwelle) \$50,000.(1 year)no direct funding.

"Influence of rootstock and nitrogen fertilizer on 'Fuji' apple growth, yield, fruit color and quality at harvest"(With E. Fallahi and W. M. Colt) \$1,000 of \$10,000 total Washington State Tree Fruit Research Commission

"Influence of nitrogen application timing on 'Delicious'apple growth, yield, fruit color, and quality" (With E. Fallahi and W. M. Colt) \$1,500 of \$15,000 total Washington State Tree Fruit Research Commission

1991:

"Increasing International Marketing of Perishable Products" (with J. Jones and C.T. Liu) USDA-CSRS Idaho International Trade Center, \$10,437 of \$47,894 total.

Grants in aid for Ongoing Postharvest Research: \$6,000 of \$24,500 total Abbott Laboratories, \$1,000 Hengeller Packing Co.

"Shifts in gene expression during the apple fruit climacteric as a function of varietal differences." with D. Oliver and D. McCarroll, IAES IMAGE program \$15,000.

"Biochemistry and Genetics of Sulfonyleurea-insensitive Acetolactate Synthase" (with C. Eberlein, D. Hoffman and D. Thill) . USDA-NRI competitive grants program 3 Years \$137,354. Year 1 portion of \$50,000: \$1,500, years 2 and 3 \$0.

Northwest Small Fruits Research Center with D. Barney USDA/ARS-UI-WSU-OSU cooperative agreement \$3,250 of \$6,500 total.

Postharvest Institute for Perishables, postdoctoral position for K. Shetty. "Alternative methods for sprout control in potatoes" (Cooperative effort with G. Kleinkopf and R. Dwelle) \$25,000.(1 year) no direct funding.

"Influence of rootstock and nitrogen fertilizer on fuji apple growth, yield, fruit color, and quality" with E. Fallahi, \$2,000 of \$10,000 total. Washington State Tree Fruit Research Commission

1990:

"Increasing International Marketing of Perishable Products" (with J. Jones and C.T. Liu) USDA-CSRS Idaho International Trade Center, \$19,459 of \$40,896 total.

"Shifts in gene expression during the apple fruit climacteric as a function of varietal differences." with D. Oliver and D. McCarroll, \$15,000 IMAGE program.

1989:

"Postharvest Investigations Designed to Support the Raspberry Industry in Northern Idaho" IAES \$5,000

"Developing Alternative Agricultural Enterprises in North Idaho" (with D. Barney, L. Makus, C. Rowe and N. Meyer) Northwest Area Foundation 3 years July, 1989-July 1992. portion of \$299,753 total. Year 1: \$10,618, Year 2: \$8,218 Year 3:\$8,591. Total direct funding: \$27,427

"Postharvest Preservation of Sugar Snap Peas" Rogers Bros. Seed Co. \$5,000

"Increasing International Marketing of Perishable Products" (with J. Jones and C.T. Liu) USDA-CSRS Idaho International Trade Center, \$14,874 of \$49,350 total.

"Stress Environments and Sulfur Cycling in Terrestrial Plants"(with S.O. Farwell) UI Faculty Seed Grant \$3,700.

"Feasibility of Developing Additional Onion Processing in the Treasure Valley" (Joint Study with J. Guenther, L. Makus, and C. Drury) SBOE Rural Economic Development \$12,000 (1 year). No portion direct funding.

"Extending the Postharvest Life of Blueberries" with M.E. Patterson WSU IMPACT program \$17,398 No direct funds to program.

1988:

"Postharvest Investigations Designed to Support the Raspberry Industry in Northern Idaho" IAES \$5,000 .

"Disinfestation of Papayas by Shrinkwrapping" USAID-Postharvest Institute for Perishables,\$5,000 (Part of a \$50,000 grant to PIP)

1987:

"Waxing of fruit with artificial and natural coatings". Washington State Tree Fruit Research Commission (with S.R. Drake) \$37,240.

1986:

"Waxing of fruit with artificial and natural coatings". Washington State Tree Fruit Research Commission (with S.R. Drake) \$15,540

"Purchasing a cold dryer for the model apple packing line". Washington State IMPACT program (with S.R. Drake and R. Bartram). \$10,000.

1985:

"Waxing of fruit with artificial and natural coatings". Washington State Tree Fruit Research Commission (with S.R. Drake). \$39,250

proposals not funded:

2002:

"Use of the poplar genome to enhance secondary metabolite production and increase soil carbon sequestration". USDOE(with J.Bassman) \$565,716

"Cabernet Sauvignon: Impact of Irrigation and Crop Load Strategies on Flavor and Phenolic Profiles of Grapes and Wines" Northwest Center for Small Fruits Research(with S.Spayd) \$26,373

"Regulated Irrigation Management to Manipulate the Wine Phenolic and Flavor Profile of Riesling" Northwest Center for Small Fruits Research(with S.Spayd) \$26,373

2001:

“Effects of Enhanced Solar UV-B Radiation on Secondary Metabolites in Two Forest Tree Species: Consequences for Tritrophic Interactions”. NSF(with J.Bassman) \$762,025

“Effects of enhanced solar UV-B radiation on secondary metabolites in two contrasting forest tree species: Consequences for tritrophic interactions” USDOE(with J.Bassman) \$762,025

2000:

“Effects of enhanced UV-B radiation on secondary metabolites in Populus trichocarpa: Implications for oxidative stress, herbivory”. NSF(with J. Bassman)\$671,264

“Effect of enhanced UV-B radiation on secondary metabolites in five forest tree species” USDA CSREES NRI(with J. Bassman)\$602,783

“Studies to improve marketability of Red Delicious through retention of fresh flavor characteristics: relationships between harvest maturity, post-storage flavor regeneration and "taste life".” Washington State Tree Fruit Research Commission \$50,606

“Studies to improve marketability of Red Delicious through retention of fresh flavor characteristics: relationships between harvest maturity, post-storage flavor regeneration and "taste life".” WSU-IMPACT \$36,285

1999:

“Effect of enhanced UV-B radiation on secondary metabolites in five forest trees: Implications for oxidative stress, herbivory, and foliage decomposition” NSF(with J. Bassman) \$ 632,480

“Electronic “nose” sensor technology development related to quality assurance of fresh and processed commodities in Washington.” WSU-IMPACT(with J. Powers and R. Cavalieri) \$ 98,749

“Huckleberry Concentrates” USDA-SBIR(with C. Edwards and L. Beck) \$64,395

1998:

“Gala flavor regeneration” Washington State Tree Fruit Research Commission \$ 30,400

“Optimal storage and packaging for maximum shelf-life and quality maintenance in sprouted legumes” USA Dry Pea and Lentil Council \$ 21,560

“Sprout inhibitor synergism” Washington Potato Commission (with J.R. Powers) \$ 25,707

“Flavor Biochemistry of Apples” Idaho Apple Commission \$ 4,980

“Chemical and Sensory Correlations of Flavor Components in Red Raspberries” Northwest Center for Small Fruits Research \$ 11,000

“Flavor Breeding” Wash. Red Raspberry Commission \$ 5,200

“Use of biocides and antimicrobials on Apples” USDA CSREES Special Grant (with C. Edwards)
\$120,341

“Effects of enhanced uv-B on secondary metabolites in forest trees” NSF(with J. Bassman) \$430,720

“CA storage of cranberries” Ocean Spray, Inc(with K. Patten) \$5,000

1997:

“Pear Skin Staining disorders” Winter Pear Control Committee, \$5,000

“Postharvest management strategies for fruits and vegetables”USDA Fund for Rural America \$468,606

1996:

“Studies of winter pear ripening” Washington State Tree Fruit Research Commission \$17,920

1995:

“Studies of winter pear ripening” Washington State Tree Fruit Research Commission \$17,635

1994:

"New Postharvest Physiology and Pathology Course" with L.J. Mitzel, WSU CAHE Instructional Grants Program \$13,000

"Expression of a flavor gene product in apples" USDA/NRICGP Seed Grants Program \$49,932

"Characterization of ecological competence and the antimicrobial nature of *Pseudomonas corrugata*" with W.Chun USDA/NRICGP Biological Control Research Grants program \$133,283

1993:

"Volatile Pea Phytochemicals to Control the Pea Weevil" \$23,856 USDA-CSRS cool Season food Legume Research Center

"Alternative Methods for Sprout control in Potatoes" with G. Kleinkopf, K. Shetty and R. Dwelle
USDA/ARS Potato Research Program \$55,155

1992:

"Purchase of a GC/MS System to study plant volatiles" USDA NRICGP Equipment Grants Program \$27,500

"Interdisciplinary research training group on plant responses to the environment" with D. Oliver, P. Berger, A. Caplan, N. Federspiel, D. Guerra, S. Herbert, B. Miller, C. Orser, A. Sylvester, and C. Weil
Joint DOE/NSF/USDA program on Collaborative Research in Plant Biology \$ 1,857,273

"Potato production, consumption, processing, and trade in the global economy" with J. Jones, J. Foltz, and J. Guentner" USDA NRICGP \$ 102,507

"Technical and economic barriers to trade of perishable agricultural products and associated technology" with A. Lingg, L. Makus, J. Jones, J. Foltz, and J. Guentner \$346,360 CSRS Special Research Grants

"Biochemical and molecular characterization of antagonism against fungal pathogens of potato by *Pseudomonas corrugata*." with W. Chun and P. Berger \$152,180, Plant Health Technologies(J.R. Simplot)

"Studies on enhancing flavor molecule biosynthesis in bananas" \$10,040, PPI-Del Monte Tropical Fruits.

1991:

"Modulation of ePG mRNA During Apple Fruit Climacteric Ripening" Idaho SBOE (with D. McCarroll) \$35,000

"Modulation of Ripening Stage Specific mRNA During Apple Fruit Climacteric" (with D. McCarroll) USDA CSRS NRI competitive grants program \$184,994

"Determination of Sufficient Nitrogen Fertilizer for Maximizing Yield and Optimum Quality of Apples with Minimum Underground Water Contamination" (with E. Fallahi and B. Simons) Washington State TFRC \$20,000.

"Pea Phytochemicals to Control the Pea Weevil" (with S.L. Clement) CSRS Cool Season Food Legume Research Center \$80,000.

1990:

"Metabolic response of birch roots to flood stress" (with R. Tripepi) \$142,064 USDA/CRGO Forest Biology

"Respiratory characteristics of sweet spanish onions" \$4,007 Idaho/Eastern Oregon Onion Research Commission

"Development of a Postharvest Management Short Course for Developing countries" (with M.E. Patterson, R.P. Cavalieri and J.R. Powers) WSU IPDO, \$10,000.

"The relationships between flavor and odor-active molecules, postharvest quality maintenance and increased red color in apples" \$50,500 Idaho Apple Commission

"A market solution to the cull onion problem" (with J. Guenther and K. Olson) \$49,237 USDA/ ISDA Federal-State Market Improvement Program

1989:

"Metabolic Adaptation of Birch Roots to Flood Stress" with R.R. Tripepi \$97,964 to NSF.

"Methiocarb Replacement Project: Finding New Chemical Bird Repellents for Wine Grapes" With L.R. Askham and R.L. Wample, WSU Horticulturists, \$107,000 to BARD and Washington State Grape Commission.

"Mass spectrometric identification of volatile compounds relevant to postharvest biotechnology." \$35,000 Idaho SBOE grant program.

"Fermentative response of birch roots to flood stress" (with R. Tripepi) USDA/CRGO \$100,784.

"Seed aging and impaired performance during germination" (with D. Wilson) USDA/CRGO \$240,910.

"Membrane alteration and aging in seeds" (with D. Wilson) UI EpsCor Program \$5,000.

"University of Idaho International Trade and Development Center of Agricultural Trade and Science" (with J. Jones, C. Liu, R. Heimsch, B. Lin and K. Olson) US Congress FY 1990 request: \$1,882,000. There has been a release of \$100,000 in federal funds to the UI as a result of this effort.

"Assessment of the use of volatile markers to segregate apples for maturity and export quality in a non destructive manner" (with M.Patterson and J. Mattheis) WSU IMPACT Center \$16,800.

"A model system to study biosynthesis of volatile compounds in apples"(with D. LeTourneau) IMAGE \$49,348

"Fermentative response of birch roots to oxygen deprivation"(with R. Tripepi) NSF \$106,791.

1988:

"A Program to Facilitate Investigations Concerning Biotechnology of Homeostatic Maintenance in Perishable Commodities" \$190,575 WSU CAHE Biotechnology Initiative Program(In conjunction with 2 WSU Faculty)

HONORS AND AWARDS:

USDA Group Honor Award for Excellence 2003

USDA-CSREES Certificate of Appreciation 2003

Who's Who in the West 1991-Present

Best Graduate Paper-Botany, Idaho Academy of Science Annual Meeting 1979