

# Curriculum Vita

## Jay F. Brunner

**Education:** B.A. in Biology, Willamette University 1969  
M.S. in Entomology, Washington State University 1973  
Ph.D. in Entomology, Washington State University 1975

### **Specialization and Areas of Particular Interest:**

Integrated pest management of insect pests on tree fruit crops. This specialization includes development of sampling methods and action thresholds, development of predictive models of insect phenology, evaluating biological control agents of tree fruit pests and use of mating disruption as a tactic for management of Lepidoptera pests of tree fruit.

### **Professional Record:**

1998-present: Director and Entomologist, Washington State University (WSU), Tree Fruit Research and Extension Center (TFREC), Wenatchee;  
1997-1998: Entomologist and Interim Superintendent, Washington State University (WSU), Tree Fruit Research and Extension Center (TFREC), Wenatchee;  
1982-1997: Associate Entomologist, WSU-TFREC, Wenatchee;  
1978-1982: Assistant Entomologist, WSU-TFREC, Wenatchee;  
1975-1978: Assistant Entomologist, Michigan State University;  
1970-1975: Graduate Research Associate in the Department of Entomology, Washington State University.

### **Philosophical Foundation:**

The approach I bring to my research position at WSU is based on my philosophy of mankind's responsibility as a steward of natural resources and accountability to society. Agriculture, forestry and animal husbandry represent segments of society with major responsibility for managing natural resources to produce food and fiber. This responsibility must be undertaken through good stewardship that maintains the quality of the land and sustains renewable resources. The revolution that occurred following World War II with the development of synthetic organic insecticides provided tremendous advances in the production of cheap food and fiber but at an ecological cost that we do not yet fully understand. I firmly believe that Integrated Pest Management (IPM), which is grounded in the principles of ecology, is the best stewardship blueprint for agriculture. Throughout my career I have developed a technology and knowledge base that supports the promotion and adoption of IPM in tree fruit production. The material presented in my résumé support the success I have had in attaining this goal.

## PUBLICATIONS

### Refereed Journals

1. DOERR, MICHAEL D, JAY F. BRUNNER and TIMOTHY J. SMITH. 2009. **Biology** and Management of Bark Beetles (Coleoptera: Scolytidae) in Washington Cherry Orchards. J. Entomol. Soc. Brit. Columbia 105, Dec. 2008. p 69-81.
2. Ulysses R. Vianna, Dirceu Pratisoli, José C. Zanon, Eraldo R. Lima Jay Brunner, Fabrício F. Pereira, José E. Serrão. 2009. Insecticide toxicity to *Trichogramma pretiosum* (Hymenoptera: Trichogrammatidae) females and effect on descendant generation. *Ecotoxicology* (2009) 18:180–186.
3. Kupke, C, J. F. Brunner and V. P. Jones. 2008. Factors influencing mating success in *Euschistus conspersus* Uhler. *Environ. Entomol.* 37: 192-197.
4. Jones, VP, M Doerr, JF Brunner. 2008. Is biofix necessary for predicting codling moth emergence in Washington State apple orchards? *Journal of Economic Entomology*.101: 1651-1657.
5. Jones, VP, NG Wiman, JF Brunner. 2008. Comparison of the effect of delayed female mating on reproductive biology of codling moth and obliquebanded leafroller. *Env. Entomol.* 37: 679-685.
6. Stelinski LL, McKenzie D, Gut LJ, Isaacs R, Brunner JF, 2007. Comparison of female attractiveness and male response among populations of *Choristoneura rosaceana* (Harris) in Western and Eastern US apple orchards. *Environmental Entomology* 36: 1032-1039.
7. Curkovic, T. and J. F. Brunner. 2007. *Choristoneura rosaceana* (Harris) and *Pandemis pyrusana* Kearfott (Lepidoptera: Tortricidae) male control in Washington State (USA) apple orchards treated with different source densities of several attracticide formulations. *Agric. Téc. (Chile)*. 67 pp 23-28.
8. Kupke, C, J. F. Brunner and V. P. Jones. 2008. Factors influencing mating success in *Euschistus conspersus* Uhler. *Environ. Entomol.* 37: 192-197.
9. Stelinski LL, McKenzie D, Gut LJ, Isaacs R, Brunner JF. 2007. Comparison of female attractiveness and male response among populations of *Choristoneura rosaceana* (Harris) in Western and Eastern US apple orchards. *Environmental Entomology* 36: 1032-1039.
10. Jones, Vincent P., James R. Hagler, Jay F. Brunner, Callie C. Baker and Tawnee D. Wilburn. 2006. An inexpensive immunomarking technique for studying movement patterns of naturally occurring insect populations. *Environ. Entomol.* 35 (4): 827-836.
11. Dunley, J.E., J.F. Brunner, M.D. Doerr and E.H. Beers. 2006. Resistance and cross-resistance in populations of *Choristoneura rosaceana* and *Pandemis pyrusana* (Lepidoptera: Tortricidae) in Washington apple. *Journal of Insect Science*, 6:14, Available online: [insectscience.org/6.14](http://insectscience.org/6.14).
12. Curkovic, T., J.F. Brunner and P.J. Landolt. 2006. Evaluation of permethrin for attracticide development against *Choristoneura rosaceana* and *Pandemis pyrusana* (Lepidoptera: Tortricidae) males. *Crop Protection*. 25: 973-976.
13. Curkovic, T. and J.F. Brunner. 2006. Courtship behavior in *Choristoneura rosaceana* (Harris) and *Pandemis pyrusana* Kearfott (Lepidoptera: Tortricidae). *Ann. Entomol. Soc. Amer.* 99(3): 617-624.
14. Dunley, J.E., J.F. Brunner, M.D. Doerr and E.H. Beers. 2006. Resistance and cross-resistance in populations of *Choristoneura rosaceana* and *Pandemis pyrusana* (Lepidoptera: Tortricidae) in Washington apple. *Journal of Insect Science*, 6:14, Available online: [insectscience.org/6.14](http://insectscience.org/6.14).
15. Curkovic, T., J.F. Brunner and P.J. Landolt. 2006. Evaluation of permethrin for attracticide development against *Choristoneura rosaceana* and *Pandemis pyrusana* (Lepidoptera: Tortricidae) males. *Crop Protection*. 25: 973-976.
16. Curkovic, T. and J.F. Brunner. 2006. Courtship behavior in *Choristoneura rosaceana* (Harris) and *Pandemis pyrusana* Kearfott (Lepidoptera: Tortricidae). *Ann. Entomol. Soc. Amer.* 99(3): 617-624.
17. Brunner, J.F., E.H. Beers, J.E. Dunley, M.D. Doerr and K.R. Granger. 2005. Role of neonicotinyl insecticides in Washington apple integrated pest management. Part I. Control of lepidopteran pests. *J. Insect Sci.* 5. 10 pp.

18. Beers, E.H., **J.F. Brunner**, J.E. Dunley, M. Doerr, and K.R. Granger. 2005. Role of neonicotinyl insecticides in Washington apple IPM. Part II. Nontarget effects on integrated mite control. *J. Insect Sci.* 5: 15 pp.
19. Curkovic, T. and **J.F. Brunner**. 2005. Residual and sublethal effects of an attracticide formulation on *Choristoneura rosaceana* (Harris), *Pandemis pyrusana* Kearfott, and *Cydia pomonella* (L.) (Lepidoptera: Tortricidae). *Crop Protection* 24(7): 637-641.
20. Jones V.P., M.D. Doerr, **J.F. Brunner**, C.C. Eastburn, T.D. Wilburn and N.G. Wiman. 2005. A synthesis of temperature-dependent developmental rate for obliquebanded leafroller, *Choristoneura rosaceana* (Harris) (Lepidoptera: Tortricidae). *J. Insect Sci.* 5:24, available online: [www.insectscience.org/5.24](http://www.insectscience.org/5.24).
21. Jones V.P., C.C. Eastburn, T.D. Wilburn and **J.F. Brunner**. 2005. Instar specific phenology of *Pandemis pyrusana* and *Choristoneura rosaceana* in Washington apple orchards. *J. Econ. Entomol.* 98: 862-874.
22. Tomaszewska, E., V.R. Hebert and **J. Brunner**. 2005. Evaluation of pheromone release from commercial mating disruption dispensers. *J. Agric. Food Chem.* 53: 2399-2405.
23. Doerr, M.D., **J.F. Brunner** and V.P. Jones. 2005. Predictive phenology model for *Lacanobia subjuncta* (Lepidoptera: Noctuidae). *J. Econ. Entomol.* 98: 2100-2106.
24. Fernandez, D.E., E.H. Beers, **J.F. Brunner**, M. Doerr and J.E. Dunley. 2005. Effects of seasonal mineral oil applications on the pest and natural enemy complexes of apple. *J. Econ. Entomol.* 98: 1630-1640.
25. Doerr, M.D., **J.F. Brunner** and L.E. Schrader. 2004. Integrated pest management approach for a new pest, *Lacanobia subjuncta* (Lepidoptera: Noctuidae), in Washington apple orchards. *Pest Management Science* 60: 1025-1034.
26. Pfannenstiel, R.S., M. Szymanski, L.A. Lacey, **J.F. Brunner** and K. Spence. 2004. Discovery of a granulovirus of *Pandemis pyrusana* (Lepidoptera: Tortricidae), a leafroller pest of apples in Washington. *J. Invertebrate Pathology* 86: 124-127.
27. Pszczolkoqski, M.A., **J.F. Brunner**, M.D. Doerr, and J.J. Brown. 2004. Enhancement of *Bacillus thuringiensis* with monosodium glutamate against larvae of obliquebanded leafroller (Lep. Tortricidae). *J. Appl. Entomol.* 128(7): 474-477.
28. Krupke, C.H. and **J.F. Brunner**. 2003. Parasitoids of the consperse stink bug, *Euschistus conspersus* (Hemiptera: Pentatomidae) in north central Washington and attractiveness of a host-produced pheromone component. *J. Entomol. Science* 38(1): 84-92.
29. 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(3): 231-239. (in Spanish)
30. Krupke, Christian and **Jay Brunner**. 2002. Response of the consperse stink bug to synthetic aggregation pheromone sources. *J. Econ. Entomol.* 94: 1500-1505.
31. Doerr, M.D., **J.F. Brunner** and V. Jones. 2002. Temperature-dependent development of *Lacanobia subjuncta* (Lepidoptera: Noctuidae). *Environ. Entomol.* 31(6): 995-999.
32. **Brunner, J.F.**, J.E. Dunley, M.D. Doerr and E.H. Beers. 2001. Effects of pesticides on *Colpoclypeus florus* (Walker) (Hymenoptera: Eulophidae) and *Trichogramma platneri* (Nagarkatti), parasitoids of leafrollers in Washington. *J. Econ. Entomol.* 95(5): 1075-1084.
33. Epstein, D.L., R.S. Zack, **J.F. Brunner**, L. Gut, and J.J. Brown. 2001. Ground beetle activity in apple orchards under reduced pesticide management regimes. *Biological Control* 297-104.
34. **Brunner, J.F.**, S. Welter, C. Calkins, R. Hilton, E.H. Beers, J. Dunley, T. Unruh, A. Knight, R. Van Steenwyk and P. Van Buskirk. 2001. Mating disruption of codling moth: a perspective from the Western United States. *IOBC-WPRS Bull.* 25(9): 11-19.
35. Reding, Michael E., E.H. Beers, **J.F. Brunner** and J.E. Dunley. 2001. Influence of timing and prey availability on fruit damage to apple by *Campylomma verbasci* (Hemiptera: Miridae). *J. Econ. Entomol.* 94(1): 33-38.
36. Thomson, Don, **J.F. Brunner**, L.J. Gut, G. Judd and A. Knight. 2001. Ten years implementing codling moth mating disruption in the orchards of Washington and British Columbia. Starting Right and Managing for Success! (Witzgall, P. and Kienzle J., eds.). *IOBC-WPRS Bulletin* Vol. 23 (1), Montfavet, France. pp. 13-20.

37. Fernandez, D.E., E.H. Beers, **J.F. Brunner**, M.E. Doerr and J.E. Dunley. 2001. Effect of mineral oil on white apple leafhopper, *Typhlocyba pomaria* McAtee, (Hemiptera: Cicadellidae) oviposition. *J. Entomol. Sci.* 36(3): 237-243.
38. Epstein, D.L., R.S. Zack, **J.F. Brunner**, L. Gut and J.J. Brown. 2000. Effects of broad-spectrum insecticides on epigeal arthropod biodiversity in Pacific Northwest apple orchards. *Environ. Entomol.* 29: 340-348.
39. Beers, E.H. and **J.F. Brunner**. 1999. Effects of low rates of esfenvalerate on pest and beneficial species in apple in comparison with a standard program. *J. Tree Fruit Prod.* 2(2): 33-48.
40. Gut, L.J. and **J.F. Brunner**. 1998. Pheromone-based management of codling moth (Lepidoptera: Tortricidae) in Washington apple orchards. *J. Agric. Entomol.* 15(4): 387-406.
41. McKillip, J.L., C.L. Small, J.J. Brown, **J.F. Brunner** and Kemet Spence. 1997. Sporogenous midgut bacteria of the leafroller, *Pandemis pyrusana* (Lepidoptera: Tortricidae). *Environ. Entomol.* 26(6): 1475-1481.
42. **Brunner, J.F.** 1996. Discovery of *Colpoclypeus florus* (Walker) (Hymenoptera: Eulophidae) in apple orchards of Washington. *Pan-Pacific Entomol.* 72(2): 5-12.
43. Gut, L.J. and **J.F. Brunner**. 1994. Parasitism of the apple maggot, *Rhagoletis pomonella*, infesting hawthorns in Washington. *Entomophaga* 39: 41-49.
44. Knight, A.L., **J.F. Brunner** and D. Alston. 1994. Survey of azinphosmethyl resistance in codling moth in Washington and Utah. *J. Econ. Entomol.* 87(2): 285-292.
45. Suckling, D.M., **J.F. Brunner**, G.M. Burnip and J.T.S. Walker. 1994. Dispersal of *Epiphyas postvittana* (Walker) and *Planotorix octo* Dugdale (Lepidoptera: Tortricidae) at a Canterbury, New Zealand orchard. *New Zealand J. Crop Hort. Sci.* 22: 225-234.
46. Varela, L.G., S.C. Welter, V.P. Jones, **J.F. Brunner** and H. Riedl. 1992. Monitoring and characterization of insecticide resistance in codling moth (Lepidoptera: Tortricidae) in four western states. *J. Econ. Entomol.* 86: 1-10.
47. Jones, V.P., D.G. Alston, **J.F. Brunner**, D.W. Davis and M.D. Shelton. 1991. Phenology of the western cherry fruit fly, (Diptera: Tephritidae) in Utah and Washington. *Ann. Entomol. Soc. Amer.* 84(5): 488-492.
48. Charmillot, P.-J. and **J.F. Brunner**. 1990. La tordeuse de la pelure *Adoxophyes orana* F.v.R. (Capua): biology, avertissement et lutte. *Revue Suisse Vitic. Arboric. Hortic.* 22(4): 243-254.
49. Barrett, B.A. and **J.F. Brunner**. 1990a. The temporal distribution of *Phyllonorycter elmaella* (Lepidoptera: Gracillariidae) and its major parasitoid, *Pnigalio flavipes* (Hymenoptera: Braconidae), in Washington apple orchards. *Environ. Entomol.* 19: 362-369.
50. Barrett, B.A. and **J.F. Brunner**. 1990b. Types of parasitoid-induced mortality, host stage preferences, and sex ratios exhibited by *Pnigalio flavipes* (Hymenoptera: Eulophidae) utilizing *Phyllonorycter elmaella* (Lepidoptera: Gracillariidae) as a host. *Environ. Entomol.* 19: 803-807.
51. Charmillot, P.-J. and **J.F. Brunner**. 1989. Summerfruit tortrix, *Adoxophyes orana*: life style, warning system and control. *Entomologia Hellenica* 7: 17-26.
52. Rathman, R.J. and **J.F. Brunner**. 1988. Observations on the biology of a new species of *Dilyta* (Hymenoptera: Charipidae) from Washington State. *Pan. Pac. Entomol.* 64(1): 93-97.
53. Rathman, R.J., R.D. Akre and **J.F. Brunner**. 1988. External morphology of a species of *Metajapyx* (Diplura: Japygidae) from Washington. *Pan-Pac Entomol.* 64(2): 185-192.
54. Barrett, B.A., **J.F. Brunner** and W.J. Turner. 1988. Variations in the color, size and thoracic morphology of *Pnigalio* species (Hymenoptera: Eulophidae) parasitizing *Phyllonorycter elmaella* (Lepidoptera: Gracillariidae) in Utah and Washington. *Ann. Entomol. Soc. Amer.* 81: 516-521.
55. AliNiasee, M.T. and **J.F. Brunner**. 1986. Apple maggot in the western United States: a review of its establishment and current approaches to management. *Bull. Entomol. Soc. Brit. Columbia* 83: 49-54.
56. **Brunner, J.F.** and R.E. Rice. 1984. Peach twig borer, *Anarsia lineatella* Zeller (Lepidoptera: Gelechiidae), development in Washington and California. *Environ. Entomol.* 15: 607-610.
57. **Brunner, J.F.**, S.C. Hoyt and G.V. Tangren. 1984. Temperature monitoring site for tree fruit pest management in north central Washington. *Agric. For. Meteorol.* 33: 315-332.

58. **Brunner, J.F.** and E.C. Burts. 1981. Potential of tree washes as a management tactic against the pear psylla. *J. Econ. Entomol.* 74: 71-74.
59. Burts, E.C. and **J.F. Brunner**. 1981. Dispersion statistics and sequential sampling plan for adult pear psylla. *J. Econ. Entomol.* 74: 291-294.
60. Welch, S.M., B.A. Croft, **J.F. Brunner** and M.F. Michels. 1978. PETE: an extension phenology modeling system for management of multi-species pest complex. *Environ. Entomol.* 7: 482-94.
61. **Brunner, J.F.**, B.A. Croft, S.M. Welch, G.W. Bird, J.L. Howes and M.J. Dover. 1980. A computer-based extension delivery system: progress and outlook. EPPO Conference on Forecasting in Crop Protection. Paris, France, June 21-24, 1977. *EPPO Bull.* 10(2): 259-268.
62. **Brunner, J.F.** and E.C. Burts. 1975. Searching behavior and growth rates of *Anthocoris nemoralis* (Hemiptera: Anthocoridae), a predator of the pear psylla, *Psylla pyricola*. *Ann. Entomol. Soc. Amer.* 68(2): 311-15.
6. Rathman, R.J. and **J.F. Brunner**. 1988. Feeding of *Medetera* species (Diptera: Dolichopodidae) on aphids and eriophyida mites on apple, *Malus domestica* (Rosaceae). *Proc. Entomol. Soc. Wash.* 90(4): 510-512.
7. Rathman, R.J. and **J.F. Brunner**. 1988. Community organization on young apple, *Malus domestica* Borkhausen, in different species pools in north central Washington. *Melanderia* 46: 65-81.
8. Barrett, B.A. and **J.F. Brunner**. 1988. Fecundity, longevity, and development rates of *Phyllonorycter elmaella* (Lepidoptera: Gracillariidae) and its major parasitoid, *Pnigalio flavipes* (Hymenoptera: Eulophidae). *Melanderia* 46: 29-35.
9. Tracewski, K.T., **J.F. Brunner**, S.C. Hoyt, and S.R. Dewey. 1987. Occurrence and development of *Rhagoletis pomonella* (Walsh) in hawthorn, *Craetegus*, of the Pacific Northwest. *Melanderia* 45: 19-25.
10. Tracewski, K.T. and **J.F. Brunner**. 1987. Seasonal and diurnal activity of *Rhagoletis zephyria* Snow. *Melanderia* 45: 26-32.

### Non-refereed Journals

1. **Brunner, J.F.** and B. Bisabri. 1998. Success naturalyte insect control - a new tool for apple IPM in the Pacific Northwest. *Down to Earth* Vol. 53 (1): 1-9.
2. Gut, L.J. and **J.F. Brunner**. 1994. Implementation of pheromone-based pest management programs in pear in Washington, USA. *Int. Org. Biol. Control/West Palearctic Reg. Sect. Bull.* 17(2): 77-85.
3. Barrett, B.A. and **J.F. Brunner**. 1992. Observations on the dynamics of *Pnigalio flavipes* (Hymenoptera: Eulophidae) interacting with *Phyllonorycter elmaella* (Lepidoptera: Gracillariidae). *Melanderia* 48: 60-68.
4. Riedl, H., W.W. Barnett, E. Beers, **J.F. Brunner**, E. Burts, B.A. Croft, P.W. Shearer and P.H. Westigard. 1992. Current status, monitoring and management of insecticide and miticide resistance on deciduous tree fruits in the western United States. *Acta Phytopathologica et Entomologica Hungarica* 27(1-4): 535-544.
5. Beers, E.H. and **J.F. Brunner**. 1992. Implementation of the codling moth model on apples in Washington State, USA. *Acta Phytopathologica et Entomologica Hungarica* 27(1-4): 97-102.
11. **Brunner, J.F.** 1987. Apple maggot in Washington State: a review with special reference to its status in other western states. *Melanderia* 45: 33-51.
12. **Brunner, J.F.**, E.C. Burts and M.G. Kers. 1984. The development, distribution and sampling for the pear psylla, *Psylla pyricola*. *In Integrated control of pear psyllids*. IOBC-WPRS Bulletin VII(5): 81-96.

### Books or Book Chapters

1. **Brunner, J.F.**, J.E. Dunley, E.H. Beers and V.P. Jones. 2006. Building a Multi-Tactic Biologically Intensive Pest Management System for Washington Orchards, pp. 131-143. *In Crop Protection Products for Organic Agriculture: Environmental, Health, and Efficacy Assessment* [Ed. A. S. Felsot and K. D. Racke]. American Chemical Society Symposium Series 947.
2. Hebert, V.R., E. Tomaszewska, **J.F. Brunner**, J.F., V.P. Jones and M. Doerr. 2006. Evaluating the Pheromone Release Rate Characteristics of Commercial Mating Disruption Devices, pp. 144-157. *In Crop Protection Products for Organic Agriculture: Environmental, Health, and Efficacy Assessment* [Ed. A. S. Felsot and K. D. Racke]. American Chemical Society Symposium Series 947.

3. **Brunner, J.F.** 1995. Management and control of arthropod pests. p. 367-391. *In Cherries: plant materials, physiology, husbandry and crop utilization*. [ed.] A.D. Webster and N.E. Looney. CAB International, Wallingford.
4. *Orchard pest management: a resource book for the Pacific Northwest*. [eds.] Beers, E.H., **J.F. Brunner**, M. Willett and G. Warner. 1993. The Good Fruit Grower, Yakima, Wash.
5. **Brunner, J.F.** 1991. Mating disruption as a control for fruit pests. pp. 89-100. *In New directions in tree fruit pest management*. [ed.] K. Williams. Good Fruit Grower, Yakima, Wash.
6. **Brunner, J.F.** 1991. Leafroller pests of fruit crops in Washington State. pp. 185-197. *In New directions in tree fruit pest management*. [ed.] K. Williams. Good Fruit Grower, Yakima, Wash.
7. Gut, L.J. and **J.F. Brunner**. 1988. Parasitoids of *Rhagoletis pomonella* (Diptera: Tephritidae) in southwest Washington. *In Advances in parasitic hymenoptera*, V.K. Gupta (ed.), pp. 469-474. E.J. Brill, New York. 546 pp.
8. Barrett, B.A. and **J.F. Brunner**. 1988. Biological control of *Phyllonorycter elmaella* (Lepidoptera: Gracillariidae) by *Pnigalio flavipes* (Hymenoptera: Eulophidae) in Washington apple orchards. *In Advances in parasitic hymenoptera*, V.K. Gupta (ed.), pp. 459-468. E. J. Brill, New York. 546 pp.
4. **Brunner, J.F.** W. Jones, E. Beers, G.V. Tangren, J. Dunley, C. Xiao and G.G. Grove. 2003. Pesticide use and IPM practices in Washington's pear and cherry orchards. *Agrichemical and Environmental News*. August 2003. No. 208. (<http://aenews.wsu.edu>)
5. Smith, T.J., J. Dunley, E.H. Beers, **J.F. Brunner**, G.G. Grove, K.M. Williams, F. Peryea, R. Parker, D.F. Mayer, R. Woodruff, C. Daniels, T. Maxwell, and S. Roberts. 2004. Crop protection guide for tree fruits in Washington 2003 (EB 0419).
6. Smith, T.J., J. Dunley, E.H. Beers, **J.F. Brunner**, G.G. Grove, K.M. Williams, F. Peryea, R. Parker, D.F. Mayer, R. Woodruff, C. Daniels, T. Maxwell, and S. Roberts. 2003. Crop protection guide for tree fruits in Washington 2002 (EB 0419).
7. Smith, T.J., J. Dunley, E.H. Beers, **J.F. Brunner**, G.G. Grove, K.M. Williams, F. Peryea, R. Parker, D.F. Mayer, R. Woodruff, C. Daniels, T. Maxwell, and S. Roberts. 2001 Crop protection guide for tree fruits in Washington (EB 0419).
8. Smith, T.J., J. Dunley, E.H. Beers, **J.F. Brunner**, G.G. Grove, K.M. Williams, F. Peryea, R. Parker, D.F. Mayer, R. Woodruff, C. Daniels, T. Maxwell, and S. Roberts. 2000 Crop protection guide for tree fruits in Washington. (EB 0419).

### Invited Review Articles

1. **Brunner, J.F.** 1994. Integrated pest management in tree fruit crops. *Food Rev. International* 10(2): 135-157.

### Extension Bulletins, Leaflets, Manuals

1. Smith, T.J., J. Dunley, E.H. Beers, **J.F. Brunner**, G.G. Grove, K.M. Williams, F. Peryea, R. Parker, D.F. Mayer, R. Woodruff, C. Daniels, T. Maxwell, and S. Roberts. 2006. Crop protection guide for tree fruits in Washington 2006 (EB 0419).
2. Jones, W., **J.F. Brunner** and D.F. Faubion. 2005. Guide to codling moth damage identification. July 2005. Fact Sheet, 2 pp. Yakima County Printing Office, Yakima, WA.
3. **Brunner, J.F.** W. Jones, E. Beers, G.V. Tangren, J. Dunley, C. Xiao and G.G. Grove. 2003. A decade of pesticide use and IPM practices in Washington's apple orchards. *Agrichemical and Environmental News*. May 2003. No. 205. (<http://aenews.wsu.edu>)
9. Smith, T.J., J. Dunley, E.H. Beers, **J.F. Brunner**, G.G. Grove, K.M. Williams, F. Peryea, R. Parker, D.F. Mayer, R. Woodruff, C. Daniels, T. Maxwell, and S. Roberts. 1999 Crop protection guide for tree fruits in Washington. (EB 0419).
10. Smith, T.J., J. Dunley, E.H. Beers, **J.F. Brunner**, G.G. Grove, K.M. Williams, F. Peryea, R. Parker, D.F. Mayer, R. Woodruff, C. Daniels, T. Maxwell, and S. Roberts. 1998 Crop protection guide for tree fruits in Washington (EB 0419).
11. **Brunner J.F.** 1996. Biology and distribution of the western and black cherry fruit flies. pp. 25-30. *In* M.T. AliNiasee and L. E. Long (eds.) *Biology and control of the cherry fruit flies: a worldwide perspective*. Oregon Agric. Exper. Sta. Special Report No. 971.

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## **Funding of Research Program**

The following pages list the specific grants I have obtained alone or with other scientists. Since 1975 I have generated over \$5 million in funding to support my research program. I have been successful in obtaining funding from a variety of different sources to support research and related educational activities in a number of different areas.

Almost 50% of my funding has been provided by the Washington fruit industry, primarily through grants from the Washington Tree Fruit Research Commission (WTFRC). This level of funding demonstrates the fruit industry's support for my program and the leadership and quality of research they feel I have provided. I have also received significant support from extramural funding from federal sources. These have been primarily from USDA special grants programs in the area of pest management. These special grants programs are highly competitive and peer reviewed. My success in obtaining grants from federal sources indicates that my ideas are creative and well organized and presented. Funding provided by chemical companies has been through gift grants that support my general research program. I have maintained an active research program in testing chemical controls as a service to the tree fruit industry and to develop the best recommendations for the use of chemical controls. The majority of my research effort with chemical controls has been directed at investigating pesticides that provide alternatives to broad-spectrum neurotoxins that have dominated tree fruit pest control programs for 35 years. Funding from state agencies has primarily involved grants from departments of agriculture in Oregon, California and Washington. These agencies have supported my research on apple maggot and biological control of leafrollers.

The majority of my research effort over the years has been in the areas of applied insect ecology, biological control and, most recently, use of pheromones for pest control. I have maintained an active program in the implementation of apple IPM and developing fundamental components, such as sampling protocols. I have maintained a balanced research and educational program in apple IPM through the successful acquisition of external support for my ideas and approach.



## Grants Received (1975-2006)

Source	Year	Amount	Topic
ES-USDA	1977	44,600	Apple IPM
ES-USDA	1978	50,000	Apple IPM
ES-USDA	1978	14,500	Apple IPM Bulletin
MSU Exp. Sta.	1978	16,000	Apple pests in native habitats
Chemical companies	1979	3,000	Pesticide testing
WTFRC	1979	9,350	Management of plant bugs
Chemical companies	1980	1,000	Pesticide testing
UC-Davis	1980	1,230	Orthene registration-IR4
USDA-SEA	1980	76,000	Plant stress and insects
WTFRC	1980	4,450	Management of plant bugs
WTFRC	1980	4,150	Green peach aphid management
Chemical companies	1981	2,200	Pesticide testing
USDA-WRIPAP	1981	20,896	Amitraz benefits
WTFRC	1981	20,000	Computer equipment (w/TFREC faculty)
WTFRC	1981	4,250	Green peach aphid management
Chemical companies	1982	26,000	Testing of IGRs - Postdoctoral support
USDA-WRIPAP	1982	26,880	Amitraz benefits
WTFRC	1982	7,100	Validation of CM model
WTFRC	1982	7,600	Green peach aphid management
Chemical companies	1983	7,000	Testing of IGRs - Postdoctoral support
USDA-WRIPAP	1983	7,060	Amitraz benefits
WSDA	1983	4,300	Apple maggot detection
WTFRC	1983	8,100	Peach and nectarine pest management
WTFRC	1983	12,000	Regional codling moth management
WTFRC	1983	32,200	Apple maggot biology, sampling and control
Chemical companies	1984	10,500	Pesticide testing
WSDA	1984	3,000	Data analysis
WTFRC	1984	8,100	Peach and nectarine pest management
WTFRC	1984	35,200	Apple maggot biology, sampling and control
WTFRC (w/Hoyt)	1984	15,700	Regional codling moth management
Chemical companies	1985	10,500	Pesticide testing
CRO	1985	11,500	Leafminer management
State funding	1985	9,105	Leafroller management
Stockwell support	1985	4,000	Development fund contribution
WTFRC	1985	36,000	Apple maggot biology, sampling and control
WTFRC (w/Hoyt)	1985	15,800	Regional codling moth management
Chemical companies	1986	13,500	Pesticide testing
CRO	1986	11,500	Leafminer management
Stockwell support	1986	4,000	Development fund contribution
W-161 Regional project	1986	20,000	Codling moth dispersal behavior
WTFRC	1986	6,000	Codling moth action thresholds
WTFRC	1986	17,000	Apple maggot biology, sampling and control
WTFRC (w/Hoyt)	1986	10,000	Leafroller management

Source	Year	Amount	Topic
CDFA	1987	8,023	Apple maggot trapping
Chemical companies	1987	34,000	Pesticide testing
CRO (w/Hoyt)	1987	5,750	Leafminer management
Stockwell support	1987	4,000	Development fund contribution
WTFRC	1987	32,000	Apple maggot biology, sampling and control
WTFRC (w/Hoyt)	1987	10,000	Leafroller management
CDFA	1988	15,000	Apple maggot trapping
Chemical companies	1988	34,000	Pesticide testing
CSRS	1988	10,000	Resistance monitoring-CM/LR/LM
WTFRC	1988	10,000	Leafroller management
WTFRC	1988	32,000	Apple maggot biology, sampling and control
Chemical companies	1989	32,000	Pesticide testing
CSRS	1989	12,500	Resistance monitoring-CM/LR/LM
Fruit packing houses	1989	4,800	CFF monitoring
WTFRC	1989	15,000	Leafminer management
Chemical companies	1990	12,300	Pesticide testing
CSRS	1990	13,500	Resistance monitoring-CM/LR/LM
Chemical companies	1991	14,000	Pesticide testing
NAPIAP (w/Beers)	1991	11,848	Pesticide survey in apple and pear
NCWFA	1991	1,000	Pesticide survey in apple and pear
Pome Club	1991	1,000	Pesticide survey in apple and pear
WA Apple commission	1991	5,000	Pesticide survey in apple and pear
WRPIAP	1991	18,000	Effects of insecticides on LM parasites
WTFRC	1991	47,450	Apple IPM
BMHA	1992	8,000	OBLR management
Chemical companies	1992	43,000	Pesticide testing
Trécé Inc	1992	20,000	CM monitoring (in kind funding)
WTFRC	1992	47,750	Mating disruption apple (CM & LR)
WTFRC	1992	21,200	Mating disruption pear
WTFRC	1992	12,500	Biological control
BMHA	1993	17,000	OBLR management
Chemical companies	1993	60,000	Pesticide testing
Pacific Biocontrol	1993	30,000	CM disruption (in-kind funding)
Trécé Inc	1993	20,000	CM monitoring (in-kind funding)
WTFRC	1993	63,450	Mating disruption apple (CM & LR)
WTFRC	1993	25,000	Mating disruption pear
WTFRC	1993	23,000	Biological control
Chemical companies	1994	50,000	Pesticide testing
Pacific Biocontrol	1994	30,000	CM disruption (in kind funding)
Trécé Inc	1994	20,000	CM monitoring (in kind funding)
WTFRC	1994	32,742	Mating disruption pear
WTFRC	1994	55,551	Biological control-LR
WTFRC	1994	26,000	Apple production without neuroactive insecticides

Source	Year	Amount	Topic
WTFRC	1994	10,000	Growth chambers
WTFRC	1994	8,496	CM lures
WTFRC (w/Alan Knight)	1994	63,739	LR Mating disruption
WTFRC (w/Herb Hill)	1994	50,000	Pheromone detection
CAAR/BMHA	1995	10,000	OBLR biocontrol
Chemical companies	1995	100,000	Pesticide testing
Exxon USA (w/Beers, Dunley, Grove)	1995	27,120	Summer oil research
Pacific Biocontrol	1995	50,000	CM disruption (in kind funding)
SARE/ACE	1995	82,984	Apple production without neuroactive insecticides
Trécé Inc	1995	20,000	CM monitoring (in kind funding)
USDA areawide (w/Lake Chelan Prod.)	1995	105,000	Areawide implementation
WTFRC	1995	46,959	Biological control-LR
WTFRC	1995	85,280	Apple production without neuroactive insecticides
WTFRC	1995	10,496	CM lures
WTFRC	1995	27,000	LR Mating disruption
WTFRC (w/Alan Knight)	1995	28,950	Stink bug biology and management
WTFRC (w/Herb Hill)	1995	10,000	Pheromone detection
WTFRC (w/Williams and Schrader)	1995	27,528	Summer oil research
CAAR/BMHA	1996	10,000	OBLR biocontrol
Chemical companies	1996	75,000	Pesticide testing
Exxon USA (w/Beers, Dunley, Grove)	1996	27,500	Summer oil research
Natl. Inst. of Biocontrol	1996	14,213	Leafroller biocontrol
Pacific Biocontrol	1996	5,000	CM disruption (in kind funding)
SARE/ACE	1996	99,626	Apple production without neuroactive insecticides
Trécé Inc	1996	15,000	CM monitoring (in kind funding)
USDA areawide(w/Lake Chelan Prod.)	1996	120,000	Areawide implementation
USDA-areawide(w/Gut)	1996	39,100	Monitoring
USDA areawide(w/Beers)	1996	36,188	Areawide implementation
WSDA/APHIS(w/LaGasa)	1996	11,500	Pest survey
WTFRC	1996	11,680	LR Mating disruption
WTFRC	1996	78,103	Apple production without neuroactive insecticides
WTFRC	1996	18,744	CM Lures
WTFRC	1996	27,405	Stink bug biology and management
WTFRC (w/Williams and Schrader)	1996	27,800	Summer oil research
WTFRC/SARE	1996	86,961	Apple production without neuroactive insecticides
CAAR/BMHA	1997	10,000	OBLR biocontrol

Source	Year	Amount	Topic
Chemical companies	1997	85,000	Pesticide testing
Exxon USA (w/Beers, Dunley, Grove)	1997	27,500	Summer oil research
Pacific Biocontrol	1997	5,000	CM disruption (in kind funding)
SARE/ACE	1997	85,390	Apple production without neuroactive insecticides
Trécé Inc.	1997	10,000	CM monitoring (in kind funding)
USDA areawide (w/Beers)	1997	74,516	Areawide implementation
USDA areawide (w/Gut)	1997	11,800	Areawide leafroller
USDA areawide (w/Gut)	1997	13,240	Areawide monitoring
USDA areawide (w/Lake Chelan Prod.)	1997	150,000	Areawide implementation
USDA-areawide (Smith et al.)	1997	62,036	Areawide implementation
USDA-areawide (w/Pfannenstiel)	1997	16,000	Biological control-LR
WTFRC	1997	79,500	LR biocontrol
WTFRC	1997	28,800	Monitoring
WTFRC	1997	16,700	Stink bug management
WTFRC (w/Williams and Schrader)	1997	27,800	Summer oil research
WTFRC/SARE	1997	88,900	Apple production without neuroactive insecticides
Chemical companies	1998	80,000	Pesticide testing
Pacific Biocontrol	1998	10,000	CM disruption (in kind funding)
Trécé Inc	1998	10,000	CM disruption (in kind funding)
USDA areawide (w/Lake Chelan Prod.)	1998	150,000	Areawide implementation
USDA areawide (w/Beers)	1998	76,000	Areawide implementation
WTFRC	1998	38,700	Sprayable pheromone A&K
WTFRC	1998	33,000	LR Biocontrol
WTFRC	1998	19,800	CM monitoring
WTFRC	1998	22,400	Stink bug management
WTFRC (w/Kemet Spence)	1998	28,000	LR virus
WTFRC (w/P. Landolt, R. Zack)	1998	39,600	Lacanobia management
Abbott Inc.	1999	6,000	Pesticide testing
Chemical companies	1999	101,000	Pesticide testing
Dow AgroSciences	1999	23,000	Pesticide testing
EPA	1999	15,000	Teaching - IM Workshop
IR-4 program	1999	10,000	LR mating disruption
Pacific Biocontrol	1999	20,000	CM disruption (in kind funding)
Trécé Inc	1999	5,000	CM disruption (in kind funding)
USDA areawide (w/Lake Chelan Prod.)	1999	100,000	Areawide implementation
USDA areawide (w/Beers)	1999	85,000	Areawide implementation
WTFRC	1999	35,000	Sprayable pheromone A&K
WTFRC	1999	23,300	LR biocontrol
WTFRC	1999	16,920	CM monitoring
WTFRC	1999	19,460	Surround testing
WTFRC	1999	37,550	Stink bug management
WTFRC (w/P. Landolt, R. Zack)	1999	38,874	Lacanobia management
Chemical companies	2000	100,000	Pesticide testing
IFAFS (w/15 scientists-Brunner PI)	2000	2,500,000	New IPM strategies (with 16 other scientists)

Source	Year	Amount	Topic
IR-4 program	2000	10,000	LR mating disruption
Pacific Biocontrol	2000	20,000	CM disruption (in kind funding)
RAMP (w/15 scientists-Welter PI)	2000	1,070,000	New IPM STRATEGIES
WSCPR	2000	20,465	Attract and Kill for LR
WTFRC	2000	35,300	Sprayable pheromone A&K
WTFRC	2000	26,002	LR biocontrol
WTFRC	2000	22,135	Surround testing
WTFRC	2000	58,330	Stink bug management
WTFRC (w/McFerson et al.)	2000	94,360	New sprayer technology
WTFRC (w/P. Landolt)	2000	30,718	New monitoring systems
WTFRC (w/P. Landolt, R. Zack)	2000	21,270	Lacanobia management
WTFRC	2001	16,280	Sprayable pheromone A&K
WTFRC	2001	10,320	LR biocontrol
WTFRC	2001	22,348	Surround testing
WTFRC	2001	44,780	Stink bug management
WTFRC (w/P. Landolt)	2000	20,960	Monitoring with bait based systems
WTFRC	2001	89162	New codling moth and leafroller management programs
WTFRC	2001	10000	IPM survey
WTFRC	2002	38,180	Behavioral-based control tactics for apple pests
Private companies	2002	140,000	Evaluation of pesticides and pheromones for apple IPM
WTFRC	2002	21,980	Monitoring with bait based systems
WTFRC	2002	106,321	New codling moth and leafroller management programs
WTFRC	2002	28,197	Stink bug management
WTFRC	2003	32,365	Behavioral-based control tactics for apple pests
WTFRC	2003	37,779	Sensor webs and automated traps
WTFRC	2003	94,978	New codling moth and leafroller management programs
WTFRC	2003	27,754	Stink bug management
WTFRC	2003	20,040	Shot hole borer biology and management
WTFRC	2003	32,244	Cullage assessment of apple and pear
Private companies	2003	184,000	Evaluation of pesticides and pheromones for apple IPM
WTFRC	2004	27,847	Stink bug management
WTFRC	2004	16,000	Shot hole borer biology and management
WTFRC	2004	34,622	New codling moth and leafroller management programs
WTFRC	2004	39,222	Sensor webs and automated traps
Private companies	2004	172,000	Evaluation of pesticides and pheromones for apple IPM
WTFRC	2005	16,000	Shot hole borer biology and management
WTFRC	2005	203,194	New codling moth and leafroller management programs
WTFRC	2005	25,898	Management of leafrollers
Private companies	2005	150,000	Evaluation of pesticides and pheromones for apple IPM
WSCPR	2005	24,605	Resistance management of leafrollers
WTFRC	2006	194,925	New codling moth and leafroller management programs
WTFRC	2006	26,922	Management of leafrollers
Private companies	2006	251,000	Evaluation of pesticides and pheromones for apple IPM
	<b>Total</b>	11,144,730	

## **Professional Activities**

I have given 32 invited presentations at scientific meetings. I have been active in professional organizations, presenting over 40 papers alone or with students or colleagues, and participating in 11 symposia. I have given over 120 extension or industry service presentations on a variety of topics. I have served or am serving currently on 17 departmental or university committees, 5 industry service committees, and 8 Entomological Society or other professional committees. I served as program committee chairman for the 1993 Pacific Branch ESA meeting; President of the Western Orchard Pest and Disease Management Conference, Portland, Oregon, 1995; and President of the Pacific Branch of the ESA in 1999. I have also served on the Executive Committee for the Pacific Branch of the ESA.

### **Editorialships, Editorial Boards, Review Panels:**

Section co-editor for pome fruit section of Arthropod Management Tests 1985-2000.

### **National, Regional, Commodity Committee Involvement:**

Member, WSDA emergency criteria committee  
Member, C. J. Miller award committee  
Member, WSDA apple maggot working group  
Member, Western Region Coordinating Committee-43  
Member, Washington State Hort. Assoc. program committee  
Member, Northwest Horticultural Council science advisory committee  
Member, ad hoc committee of NHCSAC on exotic pests  
Member, areawide education specialist advisory committee  
Member, US Apple science advisory committee

### **University Committee Involvement:**

Member, John Stark tenure advisory committee  
Chair, TFREC strategic planning committee  
Chair, John Dunley tenure advisory committee

## **Professional Leave**

I was on professional leave from September 1, 1988, to August 31, 1989. From January 1 to March 1, 1989, I was in New Zealand working with Drs. James Walker and Max Suckling of the Department of Scientific and Industrial Research (DSIR) on a research project dealing with the dispersal behavior of the light brown apple moth. From March 15 to August 31, 1989, I was in Switzerland at the Swiss Agricultural Research Center in Changins working with Dr. Pierre Charmillot. While in Switzerland, I collaborated on research on the mating disruption of apple and grape pests, effect of insect growth regulators on apple and grape pests, and on developing a phenology model for the summerfruit tortrix.

I gave three seminars to DSIR personnel at Havelock North, Canterbury, and Auckland on the subject of apple production in Washington State, emphasizing the IPM program used by the apple industry. I gave a seminar and lecture and was part of the student discussion on barriers to implementation of IPM in New Zealand at Lincoln University, Lincoln, New Zealand. I gave one seminar to the scientific community at the research center in Changins. While in Switzerland, I collaborated with Dr. Pierre Charmillot on a paper given at a meeting in Greece on the

phenology of the summerfruit tortrix. I also gave a seminar at the Federal Agricultural Research Station at Changins on IPM in Washington.

### **Graduate Student Education**

Michigan State University:

Name	Degree	Year	Involvement
Phil Schwalier	M.S.	1977	Major professor
Lutfi Sadek	M.S.	1978	Major professor
Ed Blyth	Ph.D.	1977	Member, guidance committee
Tom Dudek	M.S.	1977	Member, guidance committee
Duane Jokinen	M.S.	1976	Member, guidance committee
Matt Michels	M.S.	1978	Member, guidance committee
Hossain Seyedoleslami	M.S.	1978	Member, guidance committee
Rick Cater	M.S.	1977	Member, guidance committee
Amy Brown	M.S.	1979	Major professor
John Wells	M.S.	1978	Member, guidance committee
Mark Otto	M.S.	1979	Member, guidance committee
Henry Hogmire	Ph.D.	1978	Member, guidance committee

Washington State University:

Name	Degree	Year	Involvement
Mike Willett	M.S.	1980	Member, guidance committee
Stan Jones	M.S.	1981	Major professor
Marty Kers	M.S.	1983	Major professor
Doug Pfeiffer	Ph.D.	1984	Member, guidance committee
James Walker	Ph.D.	1985	Member, guidance committee
Robin Rathman	Ph.D.	1988	Major professor
Bruce Barrett	Ph.D.	1988	Major professor
Jose Rodriguez	M.S.	1989	Member, guidance committee
Mike Reding	Ph.D.	2000	Member, guidance committee
Peter McGhee	M.S.	1997	Major professor
Chris Nobbs	M.S.	1997	Major professor
Dave Epstein	M.S.	1998	Member, guidance committee
Mark Hitchcox	M.S.	2000	Major professor
Greg Hannig	M.S.	2000	Member, guidance committee
Glenn Thayer	M.S.	2002	Major professor
Tomislav Curkovic	Ph.D.	2004	Major professor
Christian Krupke	Ph.D.	2004	Member, guidance committee
Neal Kittleson	Ph.D.	2004-x	Member, guidance committee
Ashfaq Sial	Ph.D.	2005-x	Major professor

### **Student Dissertations**

Rodriguez, J. C. 1989. The use of pheromone traps in monitoring insecticide susceptibility and resistance in a leaf-rolling tortricid, *Pandemis pyrusana* Kearfott. M.S. Thesis, Washington State University. 78 pp.

- Barrett, B. A. 1988. The population dynamics of *Pnigalio flavipes* (Hymenoptera: Eulophidae), the major parasitoid of *Phyllonorycter elmaella* (Lepidoptera: Gracillariidae) in central Washington apple orchards. Ph.D. Thesis, Washington State University. 136 pp.
- Rathman, R. J. 1988. Species pool influences on arthropod organization and community development and structure on young apple trees, *Malus domestica* Borkhausen, in central Washington Ph.D. Thesis, Washington State University. 165 pp.
- Kers, M. G. 1983. Distribution of pear psylla, *Psylla pyricola* Foerster, and honeydew in Bartlett pear trees. M.S. Thesis, Washington State University. 43 pp.
- Nobbs, Christopher A. 1997. *Xenotemna pallorana* (Lepidoptera: Tortricidae), a possible alternative host for *Colpoclypeus florus* (Hymenoptera: Eulophidae) using alfalfa ground cover in orchard systems. M.S. Thesis, Washington State University. 52 pp.
- McGhee, Peter S. 1997. Biology and management of stink bugs (Heteroptera: Pentatomidae) in pome fruit orchards. M.S. Thesis, Washington State University. 48 pp.
- Thayer, Glenn Ryan. 2002. The sampling range of pheromone tarps baited with lures of different strength for monitoring obliquebanded leafroller, *Choristoneura rosaceana* (Harris) (Lepidoptera: Tortricidae). M.S. Thesis, Washington State University. 55 pp.
- Curkovic, Tomislav M. 2004. Behavioral responses of *Choristoneura rosaceana* (Harris) and *Pandemis pyrusana* Kearfott (Lepidoptera: Tortricidae) males to attracticide sources. Ph.D. Thesis, Washington State University. 181 pp.
- Krupke, Christian Herald. 2004. Pheromone responses and mating behavior in the consperse stink bug, *Euschistus conspersus* Uhler. Ph.D. Thesis, Washington State University. 131 pp.

### **Other Academic Involvement**

Craig Roseland, Ph.D.	1981-82	Post-doctoral Research Associate; Project - investigation of IGR and antibiotics on growth and development of pear psylla.
Kevin Tracewski, M.S.	1982-84	Research Associate; Project - investigate apple maggot biology and behavior and monitoring schemes used for detection.
Larry Gut, Ph.D.	1986-88	Postdoctoral Research Associate; Project - investigate the relationship between apple maggot catch in traps and levels of fruit infestation and model the dynamics and development of apple maggot in different hosts.



Larry Gut, Ph.D.	1991-94	Postdoctoral Research Associate; Project - determine the potential of pheromones to control Lepidoptera pests of tree fruit crops and the impact on non-target organisms.
Larry Gut, Ph.D.	1995-1998	Program Manager, SARE Project - demonstrate the potential to produce apples without the input of neurotoxic insecticides.
Robert Pfannenstiel, Ph.D.	1995-2000	Postdoctoral Research Associate; Project - biological control of leafrollers in pome fruits.
Matthew Grieshop, Ph.D.	2005-present	Postdoctoral Research Associate; Project – behavior and control of codling moth.

### **Awards, Recognition or Other Accomplishments**

Outstanding Graduate Student Award, ESA, 1974.

Served as member of USDA-EPA Fruit Action Team to develop a document outlining the constraints to, information required by, and goals of IPM in the 1990s. Participated in IPM Forum in Washington, D.C. as a panel member discussing regulatory constraints to the implementation of IPM, 1993.

Invited guest speaker, two presentations on research and tree fruit IPM in Washington at the Western Colorado Hort. Soc. annual meeting, Grand Junction, 1994.

Invited “keynote speaker” at Ontario Entomology Society meeting, 1994.

Invited symposium speaker at Northcentral ESA Branch meeting in Lexington, Kentucky, March, 1995.

President, Western Orchard Pest and Disease Management Conference, Portland, OR, 1995.

Invited symposium speaker at Third National IPM Workshop, Washington, D.C., January 1996.

Invited speaker at Club Protection Raisonnee meeting on codling moth management, Avignon France, March 1996.

Invited symposium speaker at the Eastern Branch ESA meeting - Burlington, VT - 1997.

Nomination by the Pacific Branch of the ESA as secretary of section F.

Pacific Branch ESA Award for Excellence in IPM, 1997

Team member for the CAHE Team Excellence Award, 1997.

Nominated for and finalist in CAHE Sahlin Award for a career of Public Service, 1998.

Washington State University College of Agriculture and Home Economics Team Excellence Award, 1998. Awarded to Tree Fruit IPM Team.

Pacific Branch ESA Recognition Award in Entomology, 1998.

President, Pacific Branch ESA, 1998-99. Served as President of the Pacific Branch of the ESA at the 1999 meeting in Eugene, OR.

USDA-ARS Technology Transfer Award winner along with 16 other scientists, 1998.

The Federal Laboratory Consortium for Technology Transfer Award, 1999. For using insect pheromones to demonstrate areawide suppression of the codling moth (with 16 other scientists).

C. W. Woodworth Award for outstanding accomplishments in Entomology within the Pacific Region. Presented at the 2000 Pacific Branch ESA meeting in Costa Mesa, CA, June 26, 2000.

Federal Laboratory Consortium for Technology Transfer - Award for Excellence in Technology Transfer, May 10, 2000. One of 16 scientists named in this award in recognition for research and implementation of an areawide management project for codling moth in the western US.

Award from Washington State University of the Sahlin Faculty Excellence Award for Public Service – 2001.

Jay F. Brunner, Washington State University, Wenatchee, WA, Outstanding Researcher Recognition Award, International Dwarf Tree Fruit Association, at 2005 meeting held in Wenatchee, WA.

Team Award in Pest Management, Pacific Branch Entomological Society of America, 2005 meeting held in Pacific Grove, California. Team members where: Jay F. Brunner, Elizabeth H. Beers, John E. Dunley, Vincent P. Jones, Washington State University, Wenatchee, WA; Helmut Riedl, Rick Hilton, Phil VanBuskirk, Oregon State University, Hood River, OR; Peter Landolt, Dave R. Horton, Alan L. Knight, Tom R. Unruh, USDA-ARS, Yakima Agricultural Res. Lab, Yakima, WA; Doug Light, USDA-ARS, Albany, CA; Stephen C. Welter, Robert A. Van Steenwyk, Nick J. Mills, University of California, Berkeley, CA; Jocelyn G. Millar, University of California, Riverside, CA.

Jay F. Brunner, Silver Apple Award in recognition for years of service to the tree fruit industry by the Washington State Horticultural Association at their annual meeting December 2005, Wenatchee, WA.

### **Invited addresses**

**Brunner, J.F.** Integrated management of codling moth in the western United States. Symposium speaker, Eastern Branch ESA annual meeting, Burlington, Vermont. February 1997.

**Brunner, J.F.** Integrated management of leafrollers in the western United States. Symposium speaker, Eastern Branch ESA annual meeting, Burlington, Vermont. February 1997.

**Brunner, J.F.** Management of codling moth and leafroller in the Pacific Northwest. Invited speaker at a Rohm and Haas international meeting, Orlando, Florida. March 1997.

**Brunner, J.F.** Section F Symposium: Organizer and moderator - "Pheromones as pest control tools: A changing paradigm in IPM." National ESA meeting, Nashville - 1997.

**Brunner, J.F.,** E.H. Beers, S.C. Welter, A. Knight and R. Hilton. Use of mating disruption in western fruit orchards. In: Section F Symposium "Pheromones as pest control tools: A changing paradigm in IPM" National ESA meeting, Nashville - 1997.

**Brunner, J.F.** and L.J. Gut. Leafroller management in the codling moth areawide management project. In: Informal Conference "Areawide control of codling moth: a working model," National ESA meeting, Nashville - 1997.

**Brunner, J.F.** Concept and practices of codling moth control using pheromones. Advances in Codling Moth Management in Pear, Apple & Walnut Orchards. Workshop sponsored by Univ. Calif. Sustainable Agric. Res. & Education and USDA, Sacramento, CA, Feb. 5, 1998.

**Brunner, J.F.** Integrating IGRs in pear and apples in the future. Advances in Codling Moth Management in Pear, Apple and Walnut Orchards. Workshop sponsored by; Univ. Calif. Sustainable Agric. Res. & Education and USDA, Sacramento, CA, Feb. 5, 1998.

**Brunner, J.F.** Integration of multiple tactics in pest management - novel chemicals and biological control. International Dwarf Tree Fruit Association, Pasco, WA. Feb. 22-26, 1998.

**Brunner, J.F.** Mating disruption for codling moth control in the western United States. 2nd International Conference on Pheromones, Wageningen, The Netherlands, March 30 – Apr. 3, 1998. (with John Borden asked to organize the insect control symposium at the conference)

**Brunner, J.F.** Codling moth mating disruption as a tactic for IPM in Washington Chile, July 13-15, 1998. Oral presentation at three locations and participated in two field tours discussing this topic. Sponsored by MoviAgro and Pacific Biocontrol in conjunction with Dr. Roberto Gonzales, University of Chile.

**Brunner, J.F.** Food Quality Protection Act: the impact on agriculture and IPM in tree fruits in Washington. Chile, July 13-15, 1998. Oral presentation at three locations discussing this topic. Sponsored by MoviAgro and Pacific Biocontrol in conjunction with Dr. Roberto Gonzales, University of Chile.

**Brunner, J.F.** CAMP: Codling Moth Areawide Management Project, Utah State Hort. Assoc. meeting January 26, Orem, UT.

**Brunner, J.F.** New insecticides and their role in tree fruit pest IPM programs, Utah State Hort. Assoc. meeting, January 27, Orem, UT.

**Brunner, J.F.** Organophosphate insecticides and apple production in Washington, EPA Office of Pesticide Programs, Crystal City Mall-II, Washington, DC, Nov. 2, 1999.

**Brunner, J.F.** Use of mating disruption in Washington State apple orchards, Japan Plant Protection Association, Tokyo, Japan, October 12, 1999.

**Brunner, J.F.**, E. Beers, J. Dunley, C. Calkins, A. Knight, S. Welter, and R. Hilton. 2000. Codling moth, *Cydia pomonella*, areawide management on apple and pear in the western United States – the pilot project. International Plant Protection Congress, Jerusalem, Israel.

**Brunner, J.F.** 2000. Tree fruit pest management in the western US. Lecture series at St. Thomas University, Santiago, Chile. August 17.

**Brunner, J.F.** and Christian Krupke. 2000. Advances in the understanding of stink bug behavior and biology. Washington State Hort. Association meeting, Yakima, WA, December 5, 2000.

**Brunner, J.F.** 2000. Pest control technology: monitoring techniques, new chemicals, and application methods. Washington State Hort. Association meeting, Yakima, WA, December 5, 2000.

**Brunner, J.F.** 2000. Codling moth mating disruption in the western United States. IOBC Pheromone working group meeting, Samos, Greece. Sept. 25-28.

### **Professional Society Memberships**

Entomological Society of America

### **Community Service Activities**

Cub Scout leader, 3 years

Wenatchee Youth Baseball, coach, 3 years

YMCA membership drive volunteer

YMCA racquetball program, clinic teacher, 3 years

Wenatchee Youth Soccer, coach, 2 years

High school Sunday School teacher, First Presbyterian Church, 2 years

Fifth grade Sunday School teacher, First Presbyterian Church, 2 years

Elder, First Presbyterian Church, 1985-present