LEONARD B. COOP Curriculum Vitae version 6/8/2023

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A. EDUCATION AND EMPLOYMENT INFORMATION

Education

1987 Ph.D. Dept. Entomology, Oregon State University. Thesis Title: *Management of Variegated Cutworm in Peppermint* Minor: Statistics

1983 M.S. Dept. Entomology, Oregon State University. Thesis Title: *Orange Tortrix: Parasitoid Complex and Thermal Constants for Egg Hatch* Minors: Statistics and Integrated Plant Sciences

1979 B.A. Dept. Biology, Baker University, Baldwin City, KS 66006. Minor: Chemistry

Extra-Education Trainings

2017 CLIMEX Modeling I training, APHIS PPQ Ft. Collins, CO, Apr 3-7.

1992, 1994 GIS/GRASS basic & advanced training, CWU. Ellensburg, WA

1983-2002 Numerous courses in computer science (over 36 credit hours), OSU

Employment History

2020 – present Associate Professor (Practice), Dept. Horticulture, Oregon State University (begin date: 7/1/2020)

2014 – present Associate Director for Decision Support Systems, Oregon IPM Center (Integrated Plant Protection Center before 1/1/2020), Oregon State University

2017 – 2020 Assistant Professor (Practice), Dept. Horticulture, Oregon State University

2002 – 2017 Assistant Professor (Senior Research), Botany and Plant Pathology Dept. and Integrated Plant Protection Center, Oregon State University

1987 – 2002 Research Associate, Dept. Entomology and Integrated Plant Protection Center, Oregon State University

1983 – 1987 Graduate Research Assistant, Dept. Entomology, Oregon State University

1979 – 1982 Graduate Teaching Assistant, Dept. Entomology, Oregon State University

B. TEACHING, ADVISING, AND OTHER ASSIGNMENTS

Note: Teaching is not in my position description. As outlined in our 2022-2025 NIFA TSAB grant, Coop and Barker are offering a new HORT 499/599X course, "Ecological Systems Modeling", my first class teaching since 1998. In the 1990's I developed a course on quantitative and computer modeling in IPM. I taught this course as a 3-week intensive workshop to graduate students in Brazil in 1996, and in 1998 within the OSU Entomology Dept. to undergraduate and graduate students. I taught several modules of the class for several Entomology IPM graduate level labs for classes led by Brian Croft, Paul Jepson, and Ralph Berry. This experience is consistent with my philosophy that students greatly benefit from a hands-on learning of quantitative tools in fields such as ecology, IPM, and agronomy.

1. Instructional Summary

a. Credit Courses – Main Instructor

2023. Coop, L., B. Barker, Co-Instructors, "Ecological Systems Modeling". HORT 499/599X Oregon State University Winter Term 2023.

1998. Coop, L. Instructor, "IPM Systems Modeling". ENT 312/412X Oregon State University Winter Term 1998.

1996. Coop, L. Instructor, "Concepts of Systems Modeling for IPM". Univ. Sao Paulo UNESP, Jaboticabal, April 1996. (3-week intensive workshop).

b. Credit Courses – Guest Lecturer

2018. Coop, L. Guest Lecturer, "Concepts of Systems Modeling in Agroecosystems". Oklahoma State Univ. Quantitative Microbial Forensics, Oct. 12, 2018.

2017. Coop, L. Guest Lecturer, HORT 451. Fruit Production, on Principles of IPM, Spring Term 2017.

2003. Coop, L. Guest Lecturer, "Systems IPM, Decision Support Systems and Pest Alerts", June 2023, Londrina, Brazil. Graduate course, sponsored by USDA and Embrapa.

2002. Coop, L. Guest Lecturer, ENT 420/520. Principles of Insect Ecology, Winter Term 2002.

1999-2001. Coop, L. Assistant Instructor, ENT 442. Principles of IPM: Systems Design, Winter Term 1999, 2000, 2001.

1997. Coop, L. Assistant Instructor, ENT 443. Systems Pest Management Laboratory, Winter Term 1997.

1991-1994, Coop, L. Guest Lecturer, USDA - OSU/IPPC International IPM Shortcourse, July 1991, 1992, 1993, and 1994.

1984-1995. Coop, L. Guest Lecturer, Intro IPM ENT 311, 1987, IPM II ENT 443, 1984-87, 1990, 1995.

1983-1984. Coop, L. Laboratory Instructor IPM I ENT 441 & IPM III ENT 444, 1983-84,

1979-1982. Coop, L. Teaching Assistant/Laboratory Instructor. Intro IPM ENT 311 (all 3 years), Aquatic Entomol (1980 only), Intro. Insect Biology (1981 only), Insect Systematics (1981 only)

c. Non-Credit Courses and Workshops

Summary table of teaching/extension/outreach events since 2002

Topic	Total no. Events	No. events outside Oregon		Total no. Invited
		National	International	
IPM & Weather-driven Phenology & Risk Models	33	8	0	32
IPM & Biological Control	11	0	1	10
TOTAL	**44**	**8**	**1**	**42**

44. Coop, L. 2023. Using Degree-days to Help Time Crop and Pest Activities. Pesticide Safety Education Webinar Series. Feb. 14, 2023. Online, Regional. 65 participants. **Invited.**

43. Barker, B. And L. Coop. 2023. Introduction to boxwood blight and infection model risk apps. Pesticide Safety Education Webinar Series. Jan. 18, 2023. Online, Regional. 223 participants. **Invited.**

42. Coop, L. and B. Barker. 2022. Boxwood blight infection risk app and climate suitability modeling. Oregon Boxwood Health Workshop. Oct. 20, 2022. Aurora, OR. Invited, Regional. 48 participants. **Invited.**

41. Coop, L. 2017. Weather Models and Predictive Tools for IPM. Pesticide Stewardship Conference and Recertification Course, Univ. Idaho Extension. Nov. 30, 2017. Boise, ID. 1 hr talk. **Invited.**

40. Coop, L. 2017. Web based decision tools for pest management: New and Used. Pesticide Recertification Course. Jan 24, 2017. Central Point, OR. 1 hr talk. **Invited.**

39. Coop, L. and N. Andrews. 2016. Weather forecasting (long-term forecasts) and future capacity for the modeling system and user interface. In: Introducing and Using CROPTIME: Vegetable Crop Schedule with Degree-Days. 2.5 hr lecture and hands-on computer workshop. 2016 Small Farms Conference. Feb. 20, 2016. Corvallis, OR.

38. Coop, L. 2016. Integrated Pest Management as it Relates to Climate. Blue Mountain Horticulture Society Annual Meeting. Feb. 10, 2016. Milton Freewater, OR. **Invited.**

37. Coop, L., P. Jepson, and C. Landgren. 2015. Tools for sprayers and IPM innovators – with focus on aphids and midges. Oregon Christmas Tree Assoc. Meeting. Mar 6, 2015. Wilsonville, OR. **Invited.**

36. Coop, L. 2015. Crops and Climate – Has it been getting warmer in the Pacific Northwest and how will that affect plant/crop phenology. FRED Talk (Food and Farming Research Extension and Development). Small Farms Conference. Corvallis OR Feb. 28th 2015. **Invited.**

35. Halbleib, M, C. Landgren, G. Ellen, L. Coop, G. Ahrens, T. Stone, D. Silen, others. Visioning session for IPM of Christmas Trees program. NWREC Aurora, OR. Jan 23, 2015. *Role: I led some of the discussion concerning decision support models*

34. Andrews, N., C. Bubl, L. Coop, A. Garrett, S. Kawai, J. Myers, H. Noordijk, E. Peachey, and D. Sullivan. 2015. Croptime: Vegetable degree-days. NW Horticultural Soc. Ann. Mtg. Jan 13, 2015, Canby, OR. **Invited.** *Role: I led computer modeling exercises*

33. Coop, L. and A. Dreves. 2014. Using a phenology model for spotted wing Drosophila. SWD Tool Conversations - Extension Worksop. NWREC Aurora, OR Dec 11, 2014. **Invited.**

32. Coop, L. 2014. Spotted Wing Drosophila: Predict Spring Activity and Generation Increase: Degree Day Model. NWREC Spotted Wing Drosophila Extension Workshop May 22, 2014. Aurora, OR. **Invited.**

31. Coop, L. 2014. Tree fruit decision support – phenology and plant disease risk models. Presentation at N. Willamette Tree Fruit Growers Meeting. Feb. 15, 2014. Salem, Oregon. **Invited.**

30. Coop, L. 2014. Weather data and weed control: degree-day models and pesticide drift forecasts. Presentation at Douglas County Weed Day 2014. Feb. 5, 2014. Roseburg, Oregon. **Invited.**

29. Coop, L. 2014. Using phenology models and pheromone traps. Presentation at IPPC Chemical Applicators Short Course, Jan. 7, 2014. Wilsonville, Oregon. **Invited.**

28. Coop, L. 2013. Degree Days, Climate and Mosquito Risks - Some Guidelines and Tools For Decision Support. Oregon Mosquito and Vector Control Association – Fall Meeting and Recertification Workshop. Oct 17, 2013, Newport Oregon. **Invited.**

27. Coop, L., M. Guzzy. 2012. IPPC capabilities with pest modeling and risk mitigation models – NORPAC growers meeting. Grower Meeting. Feb. 15, 2012, Salem, OR. **Invited.**

26. Coop, L. 2012. Update on Weather Driven Pest Models for IPM – IFPNET Cherry & Pear Growers. IFPnet Management Team Meeting. Feb. 10, 2012. The Dalles, OR. **Invited.**

25. Coop, L. 2012. Using Degree-day Tools to Improve Pest Management. Presentation at: Non Crop Vegetation Management Course. Jan. 25, 2012, Corvallis, OR. **Invited.**

24. Coop, L., 2011. Using weather driven Models and virtual data at uspest.org/wea. Training workshop - Potato Seed Growers Meeting. Missoula, MT. Feb. 18, 2011. **Invited.**

23. Coop, L., P. Jepson, M. Halbleib, B. Pfender 2011. Virtual Weather Stations for the Willamette Valley. Training workshop for agricultural consultants and field representatives. Chemeketa Campus Extension. Feb. 10, 2011, Salem, OR. **Invited.**

22. Coop, L., 2010. Using weather driven Models at uspest.org/wea. Talk at Montana Potato Seed Growers Meeting. Nov. 11, 2010, Bozeman, MT. **Invited.**

21. Ellen, G., P. Jepson, L. Coop, Mace Vaughan. 2010. Farmscaping for Predators, Parasitic Wasps, and Native Bees in PNW Berry Systems. Farmwalk and Farmscaping Exercise for

Blueberry and Caneberry Growers. Riverbend Organic Farms, LLC, July 13, 2010, Jefferson, OR. **Invited.** *Role: discussed parasitic wasp ecology and farmscaping needs*

20. Coop, L., G. Ellen, P. Jepson. 2010. Biological and landscape alternatives for leafroller management in caneberries – Fifth Annual Pre-Season Production Workshop for Caneberry Growers. Oregon Raspberry and Blackberry Commission. Mar. 3, 2010, Woodburn, OR. **Invited.**

19. Coop, L. & The Western Weather Workgroup. 2010. The Prospect of virtual weather for pest and disease management in winegrapes. Oregon Wine Industry Symposium. Feb 22, 2010, Eugene, OR. http://explorer.oregonwine.org/symposium/files/Sessions/Viticulture/VineyardTech/Vineyard_Tech.pdf**. Invited.**

18. Coop, L. 2010. Virtual Weather Stations and Their Application to Pest and Disease Modeling. Blue Mountain Horticultural Society. Annual Meeting. Feb. 2, 2010, Milton Freewater, OR. **Invited.**

17. Coop, L., G. Ellen, P. Jepson. 2010. Biology and Ecology of Parasitoids in Raspberries – Extension talk at 55th Annual N. Willamette Horticulture Society Meeting, Organic Section, Jan. 12, 2010. **Invited.**

16. Coop, L., G. Ellen. 2009. On-going Work on Beneficials in Caneberries. Caneberry Open House – Extension Event, NWREC, July 8, 2009. Aurora, OR. **Invited.**

15. Coop, L. 2009. Conservation Biological Control – Supporting the Needs of Leafroller Parasitoids in Caneberries. Bugscaping Farm Walk – Extension Program, June 16th, 2009. Woodburn, OR. **Invited.**

14. Coop, L. 2008. Orange Tortrix: Biology and Biological Control. NW Horticultural Society Meeting, Speaker. Jan. 17, 2008. Canby, OR. **Invited.**

13. Coop, L. 2008. Swiss Needle Cast Risk Model Presentation. Swiss Needle Cast Cooperative Field trip, Apr 29, 2008. Newport-Corvallis, OR. **Invited.**

12. Coop, L. 2006. Weather Models and Pest Management Decision Timing. Integrated Soil Nutrient and Pest Management Workshop, Nov. 8, 2006. Corvallis, OR. OSU Extension Service. **Invited.**

11. Coop, L. and P. Jepson. 2006. Support for grower networks by OSU IPPC – Online weather data and pest models. Sept 12, 2006. Milton-Freewater, OR. Grower meeting run by Umatilla Co. Extension. **Invited.**

10. Coop, L. 2006. Weather Models and Pest Management Decision Timing. Presentation. Feb 17, 2006. Redmond, OR. Presentation – Central Oregon Pest Management Course, OSU Extension. **Invited.**

9. Coop, L. 2006. Concepts of IPM. Redmond, OR. Feb 17, 2006. Redmond, OR. Presentation – Central Oregon Pest Management Course, OSU Extension. **Invited.**

8. Coop, L. 2005. Weather Models and Pest Management Decision Timing. Integrated Soil Nutrient Management Options: Practices and Tools to Protect Water Quality. Oct. 26, 2005. Vancouver, WA. iSNAP Workshop. **Invited.**

7. Coop, L. 2005. Web-Based Decision Support Tools for Nursery IPM. Farwest Nursery Show Seminars. Oregon Convention Center, Aug 2005. Portland, OR. **Invited.**

6. Coop, L. 2004. "Using Degree-Day Models in Pest Management". Presentation at the 6th Annual Small Fruit Grower's Workshop. Mar. 23. Vancouver, WA. Sponsored by WSU. **Invited.**

5. Coop, L. 2003. Dec. Lyndon, Washington. "Degree-days for Pest Management: Website Decision Making Tools" presentation at the 5th Annual Small Fruit Grower's Workshop. Sponsored by WSU. **Invited.**

4. Coop, L. 2003, Jun. Londrina, Brazil. Guest Instructor for a graduate course, "Systems IPM, Decision Support Systems and Pest Alerts", sponsored by USDA and Embrapa, Brazil. **Invited.**

3. Coop, L. 2003. Apr. Hood River, Oregon. "Web-based phenology modeling and mapping: applications for pest and disease management in tree fruits". Mid-Columbia Agric. Res. and Ext. Center Seminar. **Invited.**

2. Coop, L. 2003. Mar. Vancouver, WA. "Degree-Days for Pest Management: Website Decision Making Tools". Washington State University. 5th Annual Small Fruit Grower's Workshop in Vancouver WA. **Invited.**

1. Coop, L. 2003. Jan. Bozeman, Montana. "Applied Phenology Models. Combining weather networks, degree-days, GIS and the web for IPM decision support". IPM Crop School Workshop, Montana State University. **Invited.**

1990-2002 Summary: 9 events, 7 invited, 1 outside Oregon, 5 international

9. Coop, L. 2001, Sept. Corvallis, Oregon. "Web-Based Pest Management Tools". 2.5 hour OSU Extension Conference Technical Workshop with B. Simko, W. Bajwa, J. Pscheidt.

8. Coop, L. 2001, July 11. Victoria, Australia. "Virtual crop a model answer to growers' prayers" By Andrew Madden. The Weekly Times, Business Section. (Newspaper article). **Invited.**

7. Coop, L. M. Kogan, and W. Bajwa. 1999. Dec. Wenatchee, Washington. "Extending the principles and lessons learned outside the project and to other commodities". In: "Areawide Program for Suppression of Codling Moth: Summary of the Effect of 5 years of Control". Washington Horticultural Association Annual Meeting. **Invited.**

6. Coop, L. 1999. May. The Dalles, Oregon. "Introduction to online phenology models for IPM decision support", IPM workshop with Cherry producers. **Invited.**

5. Coop, L. 1998. Dec. Portland, Oregon. Portland Parks/Recreation Pesticide Applicators Recertification Class, Presentation titled "IPM on the World Wide Web". **Invited.**

4. Coop, L. 1991. Aug-Oct. Mali, West Africa. Directed second year of project, Crop Loss Assessment and Improved Decision Tools for Grasshopper Control in the Sahel. Survey of pest and crop in eight villages, a yields and harvest crop loss assessment, and cage experiments to determine millet damage rates by five grasshoppers species. Supervised project personnel including one American Entomologist (MS), one Senegalese Entomologist (PhD), two Malian Agronomists (MS), and three Malians for language interpretation/field work. Included at least 4 Extension meetings with growers on “IPM practices for millet pests”.

1-3. 1990. June-July & Aug-Oct. Mali, West Africa. Supervision of crop loss assessment project. Sampling of grasshoppers and millet, crop loss assessment, cage experiments on effects of grasshoppers and Meloidae to millet spikes. Included at least 3 Extension meetings with growers on “IPM practices for millet pests”. **Invited.**

Summary table of workshop events organized or co-organized since 2002

Topic	Total no. Events
Phenology & Pest Modeling	8
IPM	1

TOTAL	**9**

9. 2018. Co-organizer and Presenter of “Solarization model – hands on computer use”. OSU NWREC Solarization Workshop. J. Parke, L. Coop, et al. Oct. 29, 2018, Aurora, OR.

8. 2016. Co-organizer and presenter of “Introducing and Using CROPTIME: Forecast Options for DD Models“. Hands-on computer workshop. Coop, L. and N. Andrews. Mar. 14, 2016. Aurora, OR.

7. 2016. Co-organizer and served as computer usage and modeling advisor for “CROPTIME Scheduling Vegetable Plantings Hands-On Computer Workshop”. N. Andrews, L. Coop, et al. Jan. 2016. Corvallis, OR.

6. 2015. Co-organizer and presenter of “CROPTIME: Crop Phenology Models Interface Usability Tests“. Andrews, N., D. Andrews, L. Coop. NWREC Aurora, OR. Jan 27, 2015.

5. 2014. Co-organizer & presenter of “Techniques in Conceptual Modeling”, and on “Models in IPM”. IPPC – International IPM Workshop – New methods in IPM assessment and education. P. Jepson, M. Halbleib, L. Coop, et al. Aug. Corvallis, OR.

4. 2011. Co-organizer & presenter “Use of virtual weather for tree fruits”. Training workshop for consultants and field advisors. Coop, L., S. Castagnoli. Mar. 10, 2011. Hood River, OR.

3. 2011. Co-organizer & presenter “Use of virtual weather for winegrapes”. Training workshop for winegrape growers. Mahaffee, W., Coop, L. Mar. 2, 2011. Salem, OR.

2. 2009. Co-organizer & lead discussion/focus group for “Hood River IPM Insect and Disease Pest Modeling Website Review/Preview” 2-hour meeting/ presentation/focus session w/selected growers and field advisors. Coop, L., S. Castagnoli. Dec. 11, 2009. Hood River, OR.

1. 2009. Co-organizer & lead discussion/focus group for ”The Dalles IPM Insect and Disease Pest Modeling Website Review/Preview”. 2-hour meeting/ presentation/focus session w/selected growers and field advisors. Coop, L., L. Long. Dec. 11, 2009. The Dalles, OR.

1990-2002 Summary: 5 events, 2 international

5. 1998. Co-organizer & presenter of 1 paper on online IPM decision support. IPPC – IPM in Oregon Workshop – Use of Weather data for IPM. Nov. 1998. Corvallis, OR.

4. 1996. Co-organizer & chief trainer & presented 2 papers on millet crop loss assessment techniques in millet. CILSS/DFPV Workshop/Conference. S. Krall, L. Coop. Oct. 1996. Niamey, Niger.

3. 1996. Co-organizer of "Interactions between the phenology of biocontrol organisms and climatic conditions" for "IPM in Oregon for the 90's and Beyond", workshop organized by OSU IPPC. Sept. 11, 1996, Corvallis, Oregon.

2. 1995. Co-organized and conducted a 3-week graduate level workshop "Systems modeling for IPM" at Sao Paulo State University, Campus of Jaboticabal. S. Bortoli, L. Coop. Nov-Dec. Jaboticabal, Brazil.

1. 1995. Co-organized and conducted a workshop "Computer Applications in IPM" for "IPM in Oregon for the 90's and Beyond", organized by the OSU IPPC. Sept. Corvallis, Oregon.

Other Guest Teaching Activities

1977-1979. Coop, L. Laboratory Prep and Teaching Assistant, Baker University, 1977-79: General Biology, General Zoology, General Botany, Invertebrate Zoology.

c. Curriculum Development

2023. Coop, L., B. Barker. Co-developed the course, “Ecological Systems Modeling”, HORT 499/599X, Winter Term 2023

d. Graduate and Undergraduate Students and Postdoctoral Trainees

Graduate Students, committee member (recent)

Students in Horticulture and related Depts., committee member

Claire Donahoo	PhD	ongoing (Hort)
Todd Anderson	PhD	2023 (Hort)
Ty Nietupski	PhD	2021 (grad rep.) {Forestry FERM Dept}
Jessica Wong	PhD	2018 (Hort)

Students NOT in Horticulture and related depts.

Numerous (ca. 110) graduate committees since 2011 (as Graduate Council Representative) for departments including ECE, CEOS, BEE, Forest Eng., and Integrative Biology. Last few only:

Kacy Hayes PhD ongoing {CHS Dept}

Zhiping Wang Lee PhD ongoing {ECE Dept}
Manxin Li PhD ongoing {ECE Dept}
Stanislav_Lyakhov MS 2023 {ECE Dept}
Jarrod Hollis PhD ongoing {ECE Dept}
Alex LeClerc PhD 2022 {ECE Dept}
Junkun Chen PhD 2022 {ECE Dept}
Galpottage Senaratne PhD 2022 {ECE Dept}
Mohamed Megahed PhD 2022 {ECE Dept}

Postdoctoral trainees

Tyson Wepprich, Post-Doctoral Scholar, BPP Dept. 2017-2020 [served as Co-Advisor]

Brittany Barker, Post-Doctoral Research Associate, IPPC. 2018-present [sole Advisor]

Visiting scientists hosted

Tor-Einar Skog, Norwegian Inst. of BioEconomy, Norway, 2016-2017

e. Team or Collaborative Efforts – N/A

f. International Teaching (N/A since 1996)

2. Student and Participant/Client Evaluation – N/A

3. Peer Teaching Evaluations – N/A

4. Advising – N/A

5. Other Assignments – Research Project Summaries

Overall Research Goals

Since 1987, I have consistently held the over-arching goal of building and providing a weather and climate based decision support system (DSS) for a wide range of agricultural needs. This has reached numerous stakeholders with pest and crop management needs, for homeowners and park lands, and for forest and other natural resources management. While we (myself and several programmers over the years) have targeted end-users in Oregon and the Pacific Northwest as a primary audience, we have also tried to serve otherwise underserved users and regions throughout the USA, and as a free public service to all members of the public regardless of their background or status. Because we have been entirely funded through USDA federal grants and contracts, and

use public weather data, we have upheld the goal of serving these products freely without financial obligation from users. Much of my funding lately has been to assist APHIS PPQ (Plant Protection and Quarantine) to prevent invasive pests from entering and establishing in the United States.

Below, I break out one overall project theme (a) and four project sub-themes within this work: b) Insect pest models plus DSSs, c) Plant disease forecasting models, d) Crop phenology models, and e) Grass seed stem rust model platform.

Other project sub-themes that could be similarly treated separately would include: f) Solarization model platform, g) Beneficial and endangered insect models, h) Spatialized weather and models, i) Other climate and weather driven models including pesticide drift risk forecast models, j) Modeling infrastructures, data handling, systems administration, etc, k) Mobile apps, and l) Push technologies. As these are all interlinked I will only consider the overall project theme and 4 sub-themes here:

a) Program overview: Online Agricultural and IPM models at USPEST.ORG

Situation. The importance of, and need for decision support systems (DSSs) and tools in agriculture and integrated pest management (IPM) have been well established at least since the 1980s. In particular, dynamic models that use real-time weather data can be the most challenging to build, implement, and maintain. Most statewide IPM programs are well funded, with at least 2-4 full time personnel, and include ample support for DSS models and platforms. Oregon is a notable exception as they have had trouble acknowledging the need for a state-funded statewide IPM program, and have never provided programmatic support for online IPM DSS tools. The need for external resources is a major factor in how I built our platform for weather and climate-driven agricultural DSS.

Approach. During the late 1980s and early 1990s, as a research associate in Entomology, I was doing field research and using results to build DSS models. As I was aware of the research and implementation gap for extension DSS tools, before the WWW became the delivery platform of choice, I was building PC-based decision support modeling software. This has not been the usual mode for most scientists, who generally publish their work but lack the capacity, at least without a well coordinated support network, to deliver an actual product to decision makers.

By 1995, I started adapting this software, and building new programming, for use on the web. As a fixed-term, soft-money-supported employee, I sought grants to build these programs, and have been fortunate to continue in this activity to the present. Based upon continuous end-user feedback, I have tried to meet needs of a wide range of users, generally without regard for their status or location. I have tried to work inclusively, in partnership with all stakeholders, who include research

and extension personnel from OSU and numerous other institutions, and end-user agricultural decision makers, in selecting, developing, and supporting models within our platform.

In not having any programmatic state-level funding, I most often competed for national level grants, by innovating new ideas with wide appeal. Some of these ideas have included: combine 160+ models (current) in a single dashboard known as "MyPest Page", at **https://uspest.org/risk/models**, virtual weather stations, multiple short-term forecasts, multiple season-long climate forecasts, phenology mapping, climate suitability mapping, pest event maps, and numerous other novel additions. Many of these features and enhancements are lacking at otherwise comparable, state-level IPM DSS platforms.

Our system was designed and built with low maintenance in mind, such that a full-time systems administrator and programmer has not been needed to maintain our platform. Currently only myself and a 10-hr/week programmer (Dan Upper) are spending a small portion of our time to administer and keep this very large, very complex, system running. I estimate that 15-20% of my time is spent with systems administration, and with updating and debugging programs, and adding new weather stations to the system.

Outcomes and impact. My program has obtained over $6M in grants in order to build our platform, USPEST.ORG, and to support related research with collaborators. At this time we have approximately 144 models online, more than any other online DSS system to my knowledge. Usage of these models in model runs, the majority of which directly serve decision support needs in agriculture, has grown from an estimated total of more than 15,000 in 2005, to over 210,000 in 2010 to over 400,000 during 2018.

Scholarship. Since the time I was made an Assistant Professor (Senior Research) in 2002, I have published 59 peer reviewed publications including 11 journal articles and 3 book chapters. I have released 29 new software and decision support tools, added ca. 112 new models to our DSS platform, given 30 presentations and 26 posters to peers, and given 50 extension/outreach presentations including participation at more than 25 workshops and was co-organizer of 9 workshops. I have produced at least 7 webinars related to our models and the website platform.

b) Online Insect Pest Modeling, plus online IPM Decision Support Systems

Situation. As an Entomologist, I foresaw the need for a multi-modeling platform for insect phenological models in the early 1990's, before the WWW became prominent. By the late '90s, IPPC colleagues (Kogan and Bajwa) and I could clearly see the need for online IPM decision support systems. Now most statewide IPM programs host phenological and plant disease models

relevant to agricultural needs in the state. Our system, USPEST.ORG, is perhaps the only partially-state-funded, nationally-focused system of its kind.

Approach. Beginning in 1996, we began linking specific insect pest degree-day models with weather data from public weather networks. The launch of our degree-day modeling website was in early 1997. Also in 1997, I released an online calculator to assist in inoculative biological control of 2-spotted spider mites in strawberries, the culmination of field research and modeling work I did with Brian Croft between 1993 and 1996. With numerous grants obtained over the years, we now have an impressive platform with over 81 insect models [including 16 DDRP models] and 32,000 weather stations in our system. I do spend a great deal of time providing support, mostly email and some phone calls, for this system. I have not documented the rate or time spent on this part of my work.

Back in 1999, there was a call from OSU EESC (Extension and Experiment Station Communications) to develop an online version of the PNW Pest Control Handbooks. I developed a system to both convert and publish the print handbooks to online versions.

Around the same time (2001) I converted the PC-based DSS software "IPM for Peppermint" (IPMP) to function as a website, making this site perhaps the first to comprehensively fully integrate dynamic online tools for insects, plant diseases, and weeds for a cropping system. I did nearly the same (but less comprehensive) for a potato DSS software program during this same time frame.

Outcomes and impact. Our main degree-day modeling platform, USPEST.ORG (earlier names, IPPC2.ORST.EDU and PNWPEST.ORG) became the delivery platform I developed to release these numerous products that continue to this day. Software programs released in this category include **https://uspest.org/mint** and **https://uspest.org/potato** (PNW handbooks now produced and published by EESC).

At USPEST.ORG/WEA, the number of insect degree-day models in our system has grown from 20 in 2000, to 44 in 2010, to 75 in 2020 (plus 16 spatialized "DDRP" models considered elsewhere).

Model runs for insect models plus the generic degree-day calculator in our platform reached over 150,000 in 2020, up from 85,000 in 2016. The most popular insect degree-day models currently in our system include: generic calculator, spotted wing Drosophila, codling moth, orange tortrix, oblique-banded leafroller, w. cherry fruit fly, gypsy moth, and peach twig borer. These statistics are updated at least yearly at USPEST.ORG.

For 12 years (2002-2014) I produced the PNW online weed and insect management handbooks, which my yearly-updated programming dynamically linked to fact sheets, Ken Gray and Larry Burrell photos, degree-day models, related websites of significance, and for several years, to MSDS pesticide data sheets.

Scholarship. In the realms of insect phenology models and decision support systems, I have published 22 peer reviewed journal and book articles, 3 extension publications, presented over 62 scientific talks, posters, and proceedings, published 2 trade articles, produced over 19 web applications, and given 39 extension presentations (all since 2000). I was sole publisher of the insect and weed PNW handbooks, widely used throughout the Northwest, for 12 years, receiving 100s of thousands of page views at uspest.org (mostly accessed as PNWPEST.ORG during this time). The mint (IPMP) and potato IPM DSS websites remain in use. I have not tallied page views for these resources lately.

c) Plant Disease Forecasting Models

Situation. Plant disease infection risk and related forecasts are high-demand DSS products serving both horticultural and agronomic crop production needs. They are more data-intensive than are degree-day models, in that hourly data (or higher resolution) data is needed to properly represent the behaviors involved in providing an early warning system for infections. These models are also less modular, in that the inputs, model algorithms, and outputs all differ among different plant disease models, making them less modular and more difficult to work with, than most degree-day models. I first added models for apple and pear scab and powdery mildew around 2000. Since then, several of our largest grants and research teams have been plant disease forecast model-focused.

Approach. As part of several Weather Systems Workgroups (funded by regional IPM centers), we obtained over $3 million in USDA NIFA funding to do research and build a programming platform able to host multiple hourly-driven models potentially serving all US states and crops. This activity spanned largely from around 2005-2014. We continue to maintain and to add models to this platform, with little or no direct funding, other than the several grants we have obtained and continue to seek for boxwood blight modeling and management.

Outcomes and impact. We, (myself and an 0.8 FTE programmer who was with our program from 2007-2014), over this time period, built the USPEST.ORG “MyPest Page” modeling infrastructure that serves as an outlet for (currently) 24 hourly weather data-driven models. Of these, 20 are plant disease infection risk models, 2 are chilling requirements (vernalization) models for tree fruits and other crops, 1 is for thermal pesticide drift risk forecasting, and 1 is a generic heat and chill unit calculator that can serve many purposes including for researchers in calibrating and testing new models. Other platform enhancements and products that we built during this period include:

1) Synoptic US-wide infection risk alert maps (currently supporting 5 disease forecast models: fireblight, potato-tomato late blight, Botrytis/soybean rust, Tomcast DSV, and boxwood blight),

2) Site and gridded 7-day forecasts from the National Weather Service and Fox Weather, LLC,

3) Virtual weather stations using smart-interpolated weather data,

4) An advanced weather data quality assurance (QA) system that mitigates errors caused by data outages,

5) High-resolution disease mapping for 4 infection risk models in 4 major agricultural production regions, and

6) Full integration with our degree-day modeling platform.

Together, these achievements have reached beyond other DSS platforms in these and other areas. The number of hourly driven model, synoptic mapping, and related application runs, as of 2018 are estimated at over 220,000 runs per year, as compared to over 90,000 during 2010. Most popular models include fire blight, grape powdery mildew, late blight of potato and tomato, apple scab, botrytis, and Tomcast DSV (used to forecast several vegetable diseases).

In addition, we have 6 degree-day-related models that aid in plant disease forecasting, for fire blight, early blight of potato, hop downy mildew, end-of-season ascospore models for apple and pear scab, and a similar model for mummy berry of blueberry These 6 models have been run a total of over 39,000 times since they were added to our platform, and over the past 4 years averaged a total of 2,650 model runs per year.

Scholarship. I have authored or co-authored 4 peer-reviewed publications on plant disease modeling, participated in over 17 scientific posters, presentations, and proceedings, participated in 5 extension presentations and workshops, authored or co-authored 2 trade articles, and supervised and developed more than 5 software programs related to this area of my work since 2000.

d) Crop Phenology Models

Situation and approach. Crop development and phenology are commonly forecasted using degree-days, very similar to how insect models are developed and used. We first added over 12 crop models as requested by a Professor of Agronomy at U. Montana, serving needs for many field and forage crops grown in the Pacific Northwest. Next, I added a sweet corn model that I developed and published back in 1992, and two additional wheat phenology models. In 2012, with OSU extension agent Nick Andrews as P. I., supported by a $204K sustainable agriculture (SARE) grant, we have been researching and implementing numerous vegetable phenology models in a project known as “CROPTIME”. The CROPTIME team has involved over 10 personnel over time, and currently is

made up of leaders Nick, Heather Stoven, and myself. At this time, unfunded, we continue to analyze data, add models to the system, and work on scholarly outputs supporting the project.

Outcomes and impact. Currently, we have added 4 broccoli, 7 cucumber, 4 pepper, and 4 tomato varieties, plus models for red root pigweed, lambsquarters, and hairy nightshade to our platform. Models for several sweet corn varieties are pending soon. The main degree-day modeling program, **https://uspest.org/dd/model**, was rewritten from scratch to support the CROPTIME project, with new features including multiple start dates and a new streamlined interface. We released a smart-phone app version, **https://uspest.org/dd/model_app**, for Android devices that supports the CROPTIME project and all other degree-day models in our system. As of the end of 2018, we have logged over 3,500 model runs of CROPTIME models, and 5,200 weed model runs. We have received a great deal of positive buy-in over the years during workshops and training sessions with CROPTIME users who include growers, seed companies, and vegetable processor field advisors.

Scholarship. Besides releasing 32 CROPTIME and 17 other crop and 2 other weed phenology models (to date; 48 total crop and weed models) along with supportive documentation for the models, we have conducted 3 workshops with end-users, and 2 website usability focus groups, published 3 extension/trade publications, and 2 scientific meeting trade articles stemming from this project. An additional extension publication has been published in Jan. 2021.

e) Grass Seed Stem Rust Model Platform

Situation and approach. Grass seed is a major local agricultural commodity valued at $405 million per year (2017). Stem rust is a major epidemic disease; if unchecked total losses in yield can occur. USDA ARS scientist Bill Pfender and collaborators, having researched and built a complex epidemiological model of stem rust infection and build-up, approached us as a web hosting platform back around 2005. Since then I and programmer Dan Upper have worked with Dr. Pfender, with limited funding, to translate the model from a spreadsheet to a Perl-based program that runs as part of USPEST.ORG. It has been and remains too complex to integrate with our multi-model “MyPest Page” platform and runs as a stand-alone model.

Outcomes and impact. With yearly updates and several major changes and improvements to the model, even with Dr. Pfender now retired for 3 years, we continue to host the stem rust model with no direct funding. The model has been primarily run by extension personnel, and agricultural consultants and field advisors. I have heard that use of the model can help growers with decisions to spray fungicides, and that typically they will treat 1 or more times less when using the model forecasts. As of 2018, the model has been run over 51,000 times since released in 2007. It has had steady use of around 7,000 runs per year over the past 4 years.

Scholarship. Numerous scientific publications have been produced by Dr. Pfender et al. supporting the work, including 3 of which I am a co-author, and 1 on model construction on which Dan Upper is a co-author. I have also been author or co-author on 11 presentations, posters and reports related to the project, and participated in one training workshop on use of the software by end-users.

Current Collaborative Programs

Program and Funding	Participants	Recent Activities	Meetings at which I participated
Western & Midwest Weather Workgroups – USDA NIFA IPM Centers 2004-present	Approximately yearly meetings various locations	Report on State and multi-region activities and collaborate on grant programs	Most years 2004-present; 2005 (Corvallis, OR), 2012 (Providence RI), 2013 (Austin, TX), 2016 (Tampa FL), Fall 2020 (postponed until Spring 2022)
Program	Participants	Recent Activities	Meetings at which I participated
WERA-1017 Western IPM Coordinators Group – USDA funded yearly	State IPM Coordinators Reports, collaborate on regional and national programs	Fill in for Oregon IPM Coordinator, present grant progress reports	2010, 2011, 2012, 2014 (Bozeman MT), 2015 (Reno NV), 2017 (Boise ID), 2018 (Portland OR), 2020 (MSU hosted; remote), 2021 (USU hosted; remote), 2022 (Denver, CO)
Boxwood blight epidemiology group, led by Chuan Hong	Quarterly online meetings of boxwood blight researchers	Selected research presentations; discussion of infection risk factors and how these should be quantified and published	2021 (Aug 10, Oct 25), 2022 (Feb 7, May 9, Oct 17)
USDA-PPQ-CPHST/S&T modeling for Cooperative	Mainly CPHST/S&T and CAPS personnel	Select target species; compare and discuss approaches to modeling and mapping of invasive	2015, 2016, Apr. 2017 (Ft. Collins, CO), Mar. 2019 (Corvallis, OR), Apr. 2020 (zoom), Nov

Agricultural Pest Survey program (CAPS)		pests	17, 2022 (Raleigh, NC), Dec. 5, 2022 (zoom)
National Plant Phenology Network – USGS/ U. Arizona	Phenology / GIS specialists	Advise and share technologies for phenology models and maps, co-author publications, funded NIFA AFRI TSAB grant beginning Apr 2022	Numerous conference/Zoom calls fall 2018-present, Coauthor pubs and grant proposals & project reports
USDA SARE CROPTIME – USDA SARE	Vegetable planting and harvest scheduling	Grant-funded project led by Nick Andrews, OSU Extension	Numerous 2012-2022, new models ongoing

C. SCHOLARSHIP AND CREATIVE ACTIVITY

Summary of peer-reviewed publications

Time frame	Refereed papers	Book chapters	Extension publications	Proceedings and tech. reports	TOTAL
2020-present	5	2	3	13	23
2002-2019	9	2	4	28	43
Prior to 2002	19	0	1	23	43
TOTAL	**33**	**4**	**8**	**64**	**109**

1. Publications

a. Peer-reviewed

i. Refereed publications

33. Barker, B. S., **L. Coop**, J. Duan, and T. Petrice. An integrative phenology and climatic suitability model for emerald ash borer. Frontiers. *Submitted June 2023.*

32. Barker, B. S., **L. Coop**, C. Hong. 2022. Potential distribution of invasive boxwood blight pathogen (*Calonectria pseudonaviculata*) as predicted by process-based and correlative models. *Biology. Special issue: Biological invasions: From Prevention and Management to Ecosystem Restoration.* 32 pp. https://www.mdpi.com/2079-7737/11/6/849 Role: *Project lead, species modeling, edits*

31. Grevstad, F., T. Wepprich, B. Barker, **L. Coop**, R. Shaw, R. Bouchier. 2022. Combining photoperiod and thermal responses to predict phenological mismatch for introduced insects. Ecological Applications. https://doi.org/10.1002/eap.2557 Role: *Platform modeling, species modeling, edits*

30. Barker, B. S., **L. Coop**, T. Wepprich. F., Grevstad, G. Cook. 2020. DDRP: Real-time phenology and climatic suitability modeling of invasive insects. PLoS ONE 15(12): e0244005. https://doi.org/10.1371/journal.pone.0244005 *Role: Project lead, co-author, programming, species modeling*

29. Crimmins, T. M., K. L. Gerst, D. G. Huerta, R. L. Marsh, E. E. Posthumus, A. H. Rosemartin, J. Switzer, J. F. Weltzin, **L. Coop**, N. Dietschler, D. A. Herms, S. Limbu, R. T. Trotter, M. Whitmore. 2020. Short-term Forecasts of Pest Insect Phenology Inform Management. Ann. Ent. Soc. Am. 113:139-148. doi.org/10.1093/aesa/saz026. *Role: provided technical knowledge, content ideas, edits, and species modeling parameters*

28. Burrows, M., Thomas, C., McRoberts, N, Bostock, R. **Coop, L.**, Stack, J. 2016. Coordination of diagnostic efforts in the Great Plains: wheat virus survey and modelling of disease onset. Plant Disease, 100:1037-1045. *Role: Provide data analysis and edits*

27. Pfender, W. F., **L. B. Coop**, S. G. Seguin, M. E. Mellbye, G. A. Gingrich, and T. B. Silberstein. 2015. Evaluation of the ryegrass stem rust model STEMRUST_G and its implementation as a decision aid. *Phytopathology.* 105:35-44. Online at: <http://www.ncbi.nlm.nih.gov/pubmed/25098496> *Role: provided model programming support and edits*

26. Grevstad, F. and **L. Coop**. 2015. The consequences of photoperiodism for species in new climates. *Ecological Applications 25:1506-1517.* Online at: <http://onlinelibrary.wiley.com/doi/10.1890/14-2071.1/pdf> *Role: conducted most data analysis, GIS, programming, modeling, graphics, and edits*

25. Pfender, W., Gent, D., Mahaffee, W., **Coop, L.**, Fox, A. 2011. Decision aids for multiple-decision disease management as affected by weather input errors. *Phytopathology*. 101:644-653. Online at: <http://dx.doi.org/10.1094/PHYTO-05-10-0131 > *Role: provided modeling analysis and edits*

24. Kim, K. S., S. E. Taylor, M. L. Gleason, F. W. Nutter, Jr., **L. B. Coop**, W. P. Pfender, R. C. Seem, P. C. Sentelhas, T. J. Gillespie, A. D. Marta, S. Orlandini. 2010. Spatial Portability of Leaf wetness models based on Empirical Approaches. Agric. and Forest Meteor. 150:871-880. Online at: <http://naldc.nal.usda.gov/download/43300/PDF> *Role: provided weather data, data analysis, and edits*

23. Walton, V.M., A.J. Dreves, **L.B. Coop**, G.V. Jones and P.A. Skinkis. 2010. Developmental parameters and seasonal phenology of Calepitrimerus vitis (Acari: Eriophyidae) in wine grapes of Western Oregon. Environmental Entomology. 39:2006-2016. Online at: <http://ee.oxfordjournals.org/content/39/6/2006.long> *Role: provided modeling support, data analysis, and edits*

22. Stone, J. K., **L. B. Coop**, and D. K. Manter. 2008. Predicting effects of climate change on Swiss needle cast disease severity in Pacific Northwest forests. Canadian Journal of Plant Pathology. 30:169-176. Online at: <http://sncc.forestry.oregonstate.edu/sites/default/files/Stone_etal2008CanJ.pdf> *Role: provided modeling, data analysis, and edits*

21. Bajwa, W., **L. Coop**, M. Kogan. 2003. Integrated Pest Management (IPM) and Internet-Based Information Delivery Systems. Neotropical Entomology 32:373-383. Online at: <http://scielo.br/pdf/ne/v32n3/18749.pdf> *Role: provided data for tables and figures, primary content, and edits*

20. Song, Y.H., **L. Coop**, M. Omeg, H. Riedl. 2003. Development of a phenology model for predicting western cherry fruit fly, *Rhagoletis indifferens* Curran (Diptera: Tephritidae), emergence in the Mid-Columbia area of the western United States. Journal of Asia-Pacific Entomology. 6:187-192. Online at: <https://www.sciencedirect.com/science/article/abs/pii/S1226861508601855> *Role: assisted in modeling, data analysis, edits, and model implementation*

19. Croft, B.A. and **L.B. Coop**. 1998. Heat units, release rate, prey density, and plant age effects on dispersal by *Neoseiulus fallacis* (Acari: Phytoseiidae) after inoculation into strawberry. J. Econ. Entomol. 91:94-100. Access online via: <http://jee.oxfordjournals.org/content/91/1/94>

Role: performed most all research, data analysis, write up of methods, developed modeling, and edits

18. **Coop, L.B.** and B.A. Croft. 1995. *Neoseiulus fallacis*: dispersal and biological control of *Tetranychus urticae* following minimal inoculations into a strawberry field. Exper. Appl. Acarol. 19:31-43. Access online via: <http://link.springer.com/article/10.1007/BF00051935>

17. Horton, D.R., E.C. Burts, T.M. Lewis, and **L.B. Coop**. 1995. Sticky trap catch of winterform and summerform pear Psylla (Homoptera: Psyllidae) over non-orchard habitats. Pan-Pacific Entomol. 71:176-189. *Role: performed modeling and edits*

16. Horton, D.R., E.C. Burts, T.R. Unruh, J.L. Krysan, **L.B. Coop**, and B.A. Croft. 1994. Phenology of fall dispersal by winterform pear psylla (Homoptera: Psyllidae) in relation to leaf fall and weather. Canadian Entomologist 126:222-230. *Role: performed modeling and edits*

15. **Coop, L.B**. and B.A. Croft. 1994. Economic injury levels for Sahelian grasshoppers in millet. 1. Survey of grasshoppers and millet Injury. Nuisibles - Pests - Pragas, CILSS/UCTR/PV Bamako, Mali. 2:81-100.

14. **Coop, L.B.**, G.P. Dively, A.J. Dreves, and B. Sidibe. 1993. The adjusted length method. In. Jago, N. [ed.] Millet Crop Loss Assessment Methods. Bull. 62. Natural Resources Institute [Overseas Development Administration] Chatham, England. pp. 9-12.

13. **Coop, L.B.**, G.P. Dively, A.J. Dreves, and N.D. Jago. 1993. Damage recognition. In. Jago, N. [ed.] Millet Crop Loss Assessment Methods. Bull. 62. Natural Resources Institute [Overseas Development Administration] Chatham, England. pp. 48-61.

12. **Coop, L.B**., B.A. Croft, and R. Drapek. 1993. A model of corn earworm (Lepidoptera: Noctuidae) development, damage, and crop loss in sweet corn. J. Econ. Entomol. 86:906-916.

11. **Coop, L.B.**, B.A. Croft. 1993. Pearl millet injury by five grasshopper species (Orthoptera: Acrididae) in Mali. J. Econ. Entomol. 86:891-898.

10. Horton, D.R., E.C. Burts, T.R. Unruh, J.L. Krysan, **L.B. Coop**, and B.A. Croft. 1993. Interorchard changes in distribution of winterform pear psylla (Homoptera: Psyllidae) in relation to leaf fall and weather. Ann. Ent. Soc. Am. 86:599:608. *Role: provided modeling and edits*

9. **Coop, L.B**., Drapek, R., B.A. Croft, and G. Fisher. 1992. Relationship of corn earworm (Lepidoptera: Noctuidae) pheromone catch and silking to infestation levels in Oregon processing sweet corn. J. Econ. Entomol. 85:240-245.

8. **Coop, L.B.**, B.A. Croft. 1992. Damage rates to pearl millet by adults of five grasshopper species and *Psalydolytta* blister beetles in Mali. Tropical Pest Management. 38:201-205.

7. **Coop, L.B.**, B.A. Croft, C.F. Murphy, and S.F. Miller. 1991. A decision support system for economic analysis of grasshopper treatment operations in the African Sahel. Crop Protection. 10:485-495.

6. Drapek, R, **L.B. Coop**, B.A. Croft and G. Fisher. 1990. Improving pheromone trap catch for corn earworm monitoring in Oregon's Willamette Valley. Southwest. Entomol. 15:63-69. *Role: assisted in designing the project, data analysis, writing, and edits*

5. **Coop, L.B.**, B.A. Croft. 1990. Diapause and life history attributes of *Phytodietus vulgaris* (Hymenoptera: Ichneumonidae), a parasitoid of *Argyrotaenia citrana* (Lepidoptera: Tortricidae). Ann. Entomol. Soc. Am. 83:1148-1151.

4. **Coop, L.**, A. Knight and G. Fisher. 1989. Parasitism of orange tortrix on caneberry, *Rubus* spp. in western Oregon and Washington. J. Entomol. Soc. Brit. Columbia 86: 63-65.

3. **Coop, L.B.** 1987. Management of variegated cutworm in peppermint. PhD Thesis. Oregon State University, Dept. of Entomology. 154 pp.

2. **Coop, L.B.** and R. Berry. 1986. Reduction in variegated cutworm (Lepidoptera: Noctuidae) injury to peppermint by larval parasitoids. J. Econ. Entomol. 79:1244-1248.

1. **Coop, L.B.** 1983. Orange tortrix: parasitoid complex and thermal constants for egg hatch. MS Thesis. Oregon State University, Dept. of Entomology. 125 pp.

ii. Book Chapters

4. Bowers, J. H., Malayer, J. R., Martínez-López B., LaForest, J., Bargeron, C., Neeley, A. D., **Coop, L**., Barker, B. S., Mastin, A. J.; Parnell, S., Cosse, A. A., McCluskey, B.J., Isard, S. C., and Russo, J. M. 2022. Surveillance for Early Detection of High-Consequence Pests and Pathogens. in: Tactical Sciences for Biosecurity of Animal and Plant Systems. K. F. Cardwell and K. L. Bailey, eds. IGI Global, Hershey, Pennsylvania, USA. 78pp. *Role: co-wrote three sections of the chapter: "A Climatic Approach to Risk", "When is the Appropriate Time to Carry Out Surveillance Activities", and "Integrating Predictions of Where and When", edits.*

3. **Coop, L.** and B. S. Barker. 2020. Advances in understanding species ecology of crop insect pests and applications to IPM: Phenological and life cycle modeling of insect pests. In: Kogan, M, E. Heinrichs (eds.) Integrated Management of Insect Pests: Current and Future Developments. Burleigh Dodds Publishing, Cambridge, England. Pp 44-98. *Role: lead author of most content, edits.*

2. Stone, J. K., **L. B. Coop**, and D. K. Manter, 2007. A spatial model for predicting Swiss needle cast severity in the Pacific Northwest. Encyclopedia of Forest Environmental Threats. Forest Encyclopedia Network. Online at: <http://www.forestencyclopedia.net/p/p25/p81> *Role: performed all modeling and data analysis, edits*

1. Hannaway, D. B., C. Daly, **L. Coop**, D. Chapman and Y. Wei. 2005. GIS-based forage species adaptation mapping. pp. 319-342 in S. G. Reynolds and J. Frame (eds.) Grasslands: Developments Opportunities Perspectives. FAO and Science Pub. Inc. *Role: wrote several sections, performed data analysis, edits*

iii. Extension Publications

10. **Coop, L.**, B. S. Barker, and M. Ragozzino. 2023. Integrated Pest Management: Biological Control. in N. Kaur, editor. 2023 Pacific Northwest Insect Management Handbook. Oregon State University Extension and Experiment Station Communications. Updated Annually. <https://pnwhandbooks.org/insect/ipm/biological-control> (Updated annually). *Role: lead editor since 2018.*

9. **Coop, L**., and B. Barker. 2022. Integrated Pest Management: Biological Control. Chapter in: N. Kaur, Editor. 2022. Pacific Northwest Insect Management Handbook. Oregon State University Extension and Experiment Station Communications. pp. N2-N7. Updated Annually. Online at: <**https://pnwhandbooks.org/insect/ipm/biological-control**> *Role: lead editor since 2018.*

8. Andrews, N., **L. Coop**, H. Stoven, H. Noordijk, and A. Heinrich. 2021. Vegetable Degree-day Models. An Introduction for Farmers and Gardeners. Oregon State University Extension Service. EM 9305. 14 pp. <https://catalog.extension.oregonstate.edu/em9305> *Role: Contributed to writing, editing, modeling, analysis, and figures.*

7. Kaur, N., **L. Coop**, J. Green, B. Gerth, N. P. Anderson, and G. Fisher. 2020. Omnivorous Leaftier A ubiquitous and often minor pest of small grains and other seed crops of Western Oregon. Oregon State University Extension Service. EM 9294. 14 pp. *Role: Contributed to writing, editing, modeling, and figures.* <https://catalog.extension.oregonstate.edu/sites/catalog/files/project/pdf/em9294.pdf>

6. **Coop, L**., B. Barker, and J. Vlach. 2020. Integrated Pest Management: Biological Control. Chapter in: Hollingsworth, C, Editor. 2020 Pacific Northwest Insect Management Handbook. Oregon State University Extension and Experiment Station Communications. pp. N2-N7. Updated Annually. Online at: <**https://pnwhandbooks.org/insect/ipm/biological-control**> *Role: lead editor since 2018.*

5. **Coop, L**., D. Lowenstein, and J. Vlach. 2019. Integrated Pest Management: Biological Control. Chapter in: Hollingsworth, C, Editor. 2019 Pacific Northwest Insect Management Handbook. Oregon State University Extension and Experiment Station Communications. pp. N2-N7. Updated Annually. Online at: <**https://pnwhandbooks.org/sites/pnwhandbooks/files/insect/chapterpdf/insect19n.pdf** > *Role: lead editor since 2018.*

4. **Coop, L**., A. J. Dreves, and J. Vlach. 2018. Biological Control. Chapter in: Hollingsworth, C, Editor. 2018 Pacific Northwest Insect Management Handbook. Oregon State University Extension and Experiment Station Communications. pp. 594-599. Updated Annually. Online at: <http://insect.pnwhandbooks.org/ipm/biological-control> *Role: lead editor since 2018.*

3. Andrews, N., **Coop, L. B.**, Heinrich, A. L., Myers, J. R., Noordijk, H., Peachey, R. E., Stoven, H. M., Sullivan, D. M. 2017. Two online decision tools: organic nutrient management and crop scheduling in Oregon. Joint Small and Family Farm Production Conference and Farmer Exchange. *Role: modeling, model implementation, edits*

2. Dreves, A. J., J. Vlach, and **L. Coop**. 2006-2017. Biological Control. Chapter in: Hollingsworth, C, Editor. 2017 Pacific Northwest Insect Management Handbook. Oregon State University Extension and Experiment Station Communications. pp. 589-594. Updated Annually. Online at: <http://insect.pnwhandbooks.org/ipm/biological-control> *Role: added content, edits*

1. Knight, A., R. LaLone, G. Fisher and **L. Coop**. 1988. Managing leafrollers on caneberries in Oregon. Oregon State University Ext. Circ. 1263. 8 pp. *Role: wrote sections, provided modeling, edits*

iv. Proceedings articles and technical reports

64. Coop, L. 2023. How to use the Boxwood Blight App and Push Notifications. Created for Boxwood Blight Insight Group. 3 pp. Online at: <https://uspest.org/wea/Boxwood_blight_model_instructions.pdf> Role: main author, edits

63. **Coop, L.**, F. Grevstad, B. Barker. 2022. User Guide for uspest.org/dd/dodmaps (a version of DDRP). Created for U.S. Dept. Of Defense and USDA APHIS PPQ CPHST & CAPS. 14 pp. Online at: <**http://uspest.org/CAPS/DDRP_DODMAPS_user_guide.pdf**> *Role: main author, edits*

62. Barker, B.S. and **L. Coop**. 2021. Egyptian cottonworm, *Spodoptera littoralis* (Lepidoptera: Noctuidae). Phenology/degree-day and climate suitability model analysis for USPEST.ORG. Prepared for USDA APHIS PPQ. Version 1.0 1/8/2021. 14 pp. Online at: <*http://uspest.org/CAPS/Spodoptera_littoralis_white_paper.pdf*> *Role: phenology modeling, writing, edits*

61. **Coop, L.**, B. Barker. 2020. User Guide and Computing Infrastructure Requirements for DDRP. Created for USDA APHIS PPQ CPHST & CAPS. 10 pp. Online at: <**http://uspest.org/CAPS/DDRP_user_guide_and_platform_requirements.pdf**> *Role: main author, edits*

60. Barker, B.S. and **Coop, L.** 2020. Sunn pest, *Euygaster integriceps* (Hemiptera: Scutelleridae). Phenology/degree-day and climate suitability model analysis for USPEST.ORG. Prepared for USDA APHIS PPQ. Version 1.0 8/11/2020. 11 pp. Online at: <http://uspest.org/CAPS/Eurygaster_integriceps_white_paper.pdf> *Role: phenology modeling, edits*

59. Barker, B. S., and **L. Coop**. 2020. Pine tree lappet moth, *Dendrolimus pini* (Lepidoptera: Lasiocampidae). Phenology / degree-day and climate suitability model white paper for uspest.org. Version 1.0, 6/11/2020. 12 pp. Online at: https://uspest.org/CAPS/Dendrolimus_pini_white_paper.pdf *Role: phenology modeling, writing, edits*

58. Coop, L. 2020. Boxwood Blight Infection Risk Model. A disease caused by *Calonectria pseudonaviculata* (Fungi: Ascomycota). Documentation for USPEST.ORG. Version 2.1 5/15/2020. Online at: http://uspest.org/wea/Boxwood_blight_risk_model_summaryV21.pdf

57. Barker, B.S. and **L. Coop**. 2020. Oak ambrosia beetle, *Platypus quercivorus* (Coleoptera: Platypodidae). Phenology/degree-day and climate suitability model analysis for USPEST.ORG. Prepared for USDA APHIS PPQ. Version 1.0 3/27/2020. 11 pp. Online at: <http://uspest.org/CAPS/Platypus_quercivorus_white_paper.pdf> *Role: phenology modeling, edits*

56. Barker, B.S. and **Coop, L.** 2020. Silver Y moth, *Autographa gamma* (Lepidoptera: Noctuidae). Phenology/degree-day and climate suitability model analysis for USPEST.ORG. Prepared for USDA APHIS PPQ. Version 1.0 7/15/2020. 13 pp. Online at: <http://uspest.org/CAPS/Autographa_gamma_white_paper.pdf> *Role: phenology modeling, edits*

55. Barker, B.S. and **Coop, L.** 2020. Japanese pine sawyer beetle, *Monochamis alternatus* (Coleoptera: Cerambycidae). Phenology/degree-day and climate suitability model analysis for USPEST.ORG. Prepared for USDA APHIS PPQ. Version 1.0 2/26/2020. 11 pp. Online at: <http://uspest.org/CAPS/Monochamus_alternatus_white_paper.pdf> *Role: phenology modeling, edits*

54. Barker, B.S. and **Coop, L.** 2020. Tomato leafminer, *Tuta absoluta* (Lepidoptera: Gelechiidae). Phenology/degree-day and climate suitability model analysis for USPEST.ORG. Prepared for USDA APHIS PPQ. Version 1.0 1/23/2020. 13 pp. Online at: <http://uspest.org/CAPS/Tuta_absoluta_white_paper.pdf> *Role: phenology modeling, edits*

53. Barker, B.S. and **Coop, L.** 2020. Honeydew moth, *Cryptoblabes gnidiella* (Lepidoptera: Pyralidae). Phenology/degree-day and climate suitability model analysis for USPEST.ORG. Prepared for USDA APHIS PPQ. Version 1.0 12/9/2019. 13 pp. Online at: <http://uspest.org/CAPS/Cryptoblabes_gnidiella_white_paper.pdf> *Role: phenology modeling, edits*

52. Barker, B.S. and **Coop, L.** 2020. Small tomato borer/tomato fruit borer, *Neoleucinodes elegantalis* (Lepidoptera: Crambidae). Phenology/degree-day and climate suitability model analysis for USPEST.ORG. Prepared for USDA APHIS PPQ. Version 2.0 4/26/2020. 10 pp. Online at: <http://uspest.org/CAPS/Neoleucinodes_elegantalis_STB_model_White_Paper.pdf> *Role: phenology modeling, edits*

51. Barker, B.S. and **Coop, L.** 2019. False codling moth, *Thaumatotibia leucotreta* (Lepidoptera: Tortricidae). Phenology/degree-day and climate suitability model analysis for USPEST.ORG. Prepared for USDA APHIS PPQ. Version 1.0 12/2/2019. 13 pp. Online at: <http://uspest.org/CAPS/Thaumatotibia_leucotreta_white_paper.pdf> *Role: phenology modeling, edits*

50. **Coop, L.** 2017. User's Guide to DDRP maps for prediction of when and where to monitor invasive species. Examples developed for false codling moth (FCM), *Thaumatotibia leucotreta*.Version 1.0 5/14/2017. Created for USDA APHIS PPQ CPHST & CAPS. 9 pp.

Online at:
<**http://uspest.org/CAPS/FCM888/Guide_To_DDRP_Maps_False_Codling_Moth_Example.pdf**>

49. Andrews, N., **Coop, L. B.**, Heinrich, A. L., Myers, J. R., Noordijk, H., Peachey, R. E., Stoven, H. M., Sullivan, D. M. 2017. Two Online Decision Tools: Organic Nutrient Management and Crop Scheduling in Oregon. *Sino-U.S. Agricultural Education* (pp. 8). Corvallis, OR: Oregon State University. *Role: oversaw model development and implementation*

48. Meland, M., O. Frøynes, **L. Coop** and C. Kaiser, 2017. Sweet cherry flower phenology in a mesic Nordic climate. Proceedings of the COST Cherry FA 1104 Working Group 2. Cherry phenology, modelling and climate change. *Acta Horticulturae* 1162, 19-22. *Role: developed models, edits*

47. **Coop, L.** A. Fox, G. Grove, and G. Cook. 2016. Medium and Extended Range Weather and Climate Forecasts Scaled and Teested for IPM Decision Support in US States. Poster presented at NW Climate Conference, Nov. 15, 2016, Stephenson, WA. Online at: <http://uspest.org/ipm/USPEST_Climate_Forecasts_NW_CLIM_CONF_2016b.pdf >

46. Andrews, N., **L. B. Coop**, H. E. Noordijk, and J. R. Myers. 2015. Crop Time: Degree-day Models and an Online Decision Tool for the Vegetable Industry. HortScience Supplement. 50:S138. Not avail. Online. *Oversaw model development, model implementation, documentation*

45. Batuman, O., A.J. Campbell, D.E. Ullman, R.L. Gilbertson, N. McRoberts, and **L. Coop**. 2015. Using a degree day insect development model to guide strategic management of western flower thrips and tomato spotted wilt virus (family Bunyaviridae, genus Tospovirus) on processing tomato in the central valley of California. Acta Horticulturae 1069:309-314. Access online at: <http://pubag.nal.usda.gov/pubag/article.xhtml?id=3112304&searchText=author%3A%22R.+L.+Gilbertson%22&searchField=> *Role: western flower thrips modeling analysis*

44. Dreves, A. J., **L. Coop**, A. Ohrn, T. Peerbolt, J. Todd. 2015. Spotted wing Drosophila: Timing early season treatments. Pacific Northwest Pest Management Conference, Portland, OR. Jan 2015. Access online at: <https://ir.library.oregonstate.edu/downloads/fx719p66z> *Role: developed models for spotted wing Drosophila, edits, slides*

43. Kaiser, C., **L. Coop**, M. Meland. 2014. Developing a robust, predictive model for sweet cherry (Prunus avium L.) flowering, comparing eastern Oregon and mesic Nordic climates. Am. Soc. Hort. Sci. 2013 Annual Conference. Access online at:

<https://www.researchgate.net/publication/267353636_Developing_a_Robust_Predictive_Model_for_Sweet_Cherry_Prunus_avium_L_Flowering_Comparing_Eastern_Oregon_and_Mesic_Nordic_Climates> *Role: developed sweet cherry flowering models*

42. **Coop, L**. A. J. Dreves, A. Ohrn, and P. Jepson. 2013. Phenology Models from USPEST.ORG – recent developments. Poster presented at Entomological Society of America, Pacific Branch Annual Meeting, Apr. 3, 2013, Lake Tahoe, CA. Online at: < http://uspest.org/ipm/USPEST_POSTER_Lake_Tahoe_2013_PBESA_Apr_3a.pdf>

41. Thomas, C. S., A. Coggeshall, R. M. Bostock, N. McRoberts, M. Burrows, E. Luke, M. Hill, P. Poe, S. Clark, **L. Coop**, P. Jepson, F. Nutter, S. Dabade, M. Draper. 2012. NPDN Expands Analysis of the National Repository. Phytopathology. 102:13. *Role: provide degree-day maps and modeling analysis*

40. **Coop, L. B.** and J. K. Stone. 2010. Climate models for predicting distribution and severity of Swiss Needle Cast. In: D. Shaw, Ed. Swiss Needle Cast Cooperative Annual Report, 2010. College of Forestry, Oregon State University. pp. 68-82. Online at: <http://www.fs.fed.us/wwetac/projects/PDFs/SNC_Modeling_report_Oct_2010.pdf>

39. **Coop, L**, A. Fox, W. Mahaffee, D. Gent, W. Pfender, C. Daly, C. Thomas, P. Jepson. 2009. Forecast and virtual weather driven plant disease risk modeling system. Phytopathology. 99:S24.

38. Gent, D., **L. Coop**, C. Daly, A. Fox, G. Grove, D. Gubler, P. Jepson, D. Johnson, W. Mahaffee, W. Pfender, J. Strand, C. Thomas. 2009. Next steps on the horizon for weather and climate-based decision-support systems. Phytopathology. 99:S182. *Role: provide content, edits*

37. Daly, C., **L. Coop**, A. Fox, C. Thomas. 2009. Novel approaches to spatial and temporal estimation of diverse western meteorology. Phytopathology. 99:S181. *Role: developed modeling platform, model analysis*

36. Mahaffee, W., D. Gent, **L. Coop**, C. Daly, A. Fox, G. Grove, D. Gubler, P. Jepson, D. Johnson, P. Pfender, J. Strand, C. Thomas. 2009. Overview of the Western IPM Weather Workgroup-Diverse collaboration to meet challenges. Phytopathology. 99:S184. *Role: provide content including models*

35. **Coop, L.**, P. Jepson, G. Grove, A. Fox, C. Daly, W. Mahaffee, C. Thomas. 2008. Delivery of IPM Tools in Real Time for Decision Support – Pull. APS Pacific Division Annual Meeting, Jackson, WY, June 25, 2008. Symposium. <http://pnwpest.org/ipm/Coop_etal_Pacific_Div_APS_2008.pdf>

34. Berry, R. E and **L. B. Coop**. 2007. Summary of Integrated Pest Management on Peppermint - IPMP 3.0. Proc. North American Root Weevil Workshop, Nov. 11, 2001. Oregon State University Agric. Exp. Sta. Special Report 1065:33-34. *Role: developed software and models*

33. **Coop, L. B.** and J. K. Stone. 2007. Prediction Maps of Swiss Needle Cast Needle Retention Based on Climatic Factors. In: D. Shaw, Ed. Swiss Needle Cast Cooperative Annual Report, 2007. College of Forestry, Oregon State University. <http://www.cof.orst.edu/coops/sncc/pdfs/sncc07.pdf>

32. **Coop, L. B.**, J. K. Stone, and A. Fox. 2007. A spatial model for foliar life expectancy in Douglas fir affected by swiss needle cast. Phytopathology 97:S92. <http://uspest.org/snc/SNC_poster_APS_07_Coop_etal_1b.pdf >

31. Pfender, W., **Coop, L.**, and Upper, D. 2006. An interactive website to deliver a weather-based stem rust warning system for perennial ryegrass seed crops in NW USA. Phytopathology 96:S93. Not available online. *Role: developed modeling platform, supervised programmer*

30. Stone, J. K. and **L. B. Coop**. 2006. Developing spatial models for predicting Swiss needle cast distribution and severity. In: D. Shaw, Ed. Swiss Needle Cast Cooperative Annual Report, 2006. College of Forestry, Oregon State University. *Role: developed models, provided content, edits*

29. Lipp, C., **L. Coop**, and W. Pfender. 2006. Stem rust prediction and decision aid for disease management on grass seed crops. GSCSSA Progress Report 2006: <http://gscssa.wsu.edu/progress/06/706.pdf> *Role: supervised modeling, developed model delivery platform*

28. Stone, J. K., **L. B. Coop**, and D. K. Manter. 2006. A spatial model for predicting effects of climate change on Swiss needle cast disease severity in the Pacific Northwest. USDA-Forest Service: Advances in Threat Assessment and its Implications for Forest and Rangeland Management, Ft. Collins CO, July 18-22, 2006. *Role: performed swiss needle cast modeling*

27. Gringrich, G. A., Me. E. Mellbye, W. F. Pfender and **L. B. Coop**. 2005. Preliminary evaluation of the effectiveness of the USDA rust model on perennial ryegrass in 2004. 2004 OSU Seed Research Reports. *Role: developed model delivery platform, supervised programmer*

26. Spotts, R.A., Serdani, M., and **Coop, L.B.** 2005. Where has all the pear scab gone? Proceed. Oregon Horticultural Soc. Paper available at pome fruit section at: <http://www.oregonhorticulturalsociety.org/newsletter/index.php> *Role: developed model analysis and model delivery platform, slides*

25. **Coop, L. B.** 2004. Using Degree-Day Models in Pest Management. Proceedings 6th Annual Small Fruit Grower's Workshop. WSU Vancouver, March 23, 2004. pp. 21-26.

24. Song, Y.H., **L. Coop**, M. Omeg, A. Walston, H. Riedl. 2004. Development of a phenology model for predicting western cherry fruit fly, Rhagoletis indefferens Curran (Diptera: Tephritidae), emergence and oviposition in the Mid-Columbia area of Oregon. Orchard Pest and Disease Management Conference, Portland, Oregon. Jan 2004. <http://entomology.tfrec.wsu.edu/wopdmc/2004PDFs/Abs04%20Biology%20Song.pdf> *Role: modeling analysis and delivery platform*

23. **Coop, L.** and P. Jepson. 2003. Online Site-Specific Degree-Day Predictions Using GIS and Climate Map Technologies. 4th National IPM Symposium/Workshop Poster Abstract, Apr. 2003. Indianapolis Indiana. Available from The Oregon IPM Newsletter, Supplement to Issue No. 1. Integrated Plant Protection Center publication, <http://oregonipm.ippc.orst.edu/On-Line%20DD.pdf>

22. **Coop, L. B.** 2003. Degree-days for Pest Management: Website Decision Making Tools. Proceedings 5th Annual Small Fruit Grower's Workshop. WSU Vancouver, March 19, 2003. pp. 60-62.

21. **Coop, L. B.**, M. Kogan, and W. Bajwa, 2002. Online Weather Data and Degree-Days: Project Summary 2002. Update to Final Project Report to Western Regional IPM Program - Extension. Integrated Plant Protection Center publication, <http://pnwpest.org/wea/Summary_Phenology_02a.pdf>

20. **Coop, L. B.** 2001. Pest Management Decision Tools: Examples of web-based phenology models, GIS, and databases for IPM decision support. IPPC/USDA CSREES Western Region Pest Management Center/PNW Pest Management Coalition Agroecological Regions Workshop: The Application of Watershed, Basin, and Ecoregion Analytical Tools to Pest Management. Integrated Plant Protection Center Web Site Publication E.10-01-1: <http://ippc2.orst.edu/slides/ecoreg1>

19. **Coop, L. B.**, M. Kogan, W. Bajwa, 2001. Information exchange driven IPM: applied research and decision support. Final Project Report to Western Regional IPM Program - Extension. Integrated Plant Protection Center website <http://pnwpest.org/wea/Rpt_WR_IPM_01c.html>

18. **Coop, L. B**, M. Kogan and W. Bajwa. 2000. Extending the principles and lessons learned outside the project and to other commodities. In: Areawide Program for Suppression of Codling

Moth: Summary of the Effect of 5 Years of Control. Proc. 95th Ann. Wash. State Hortic. Assoc. pp. 176-183.

17. **Coop, L. B.** 1999. Online decision support for IPM. Conf. Proc. IPM in Oregon: Achievements and Future Directions. Oregon State University Integrated Plant Protection Center, April 7, 1999, Corvallis, Oregon.

16. Croft, B. A., H. W. Riedl, A. L. Knight, and **L. B. Coop**. 1997. Pheromone trap catch of codling moth in grid transects leading from areas of mating disruption: definition of plume edge and impacts on males in nearby nontreated orchards or habitats. Proceedings of the 71st Ann. Western Orchard Pest and Disease Management Conference. Portland, Oregon. Jan. 1997. <http://entomology.tfrec.wsu.edu/wopdmc/1997PDF/7-Mating/Mating%2097-2.pdf> *Role: data collection and analysis*

15. **Coop, L. B.**, S. Krall, and B. Sidibe. 1996. Comparison of two methods of crop loss assessment for estimation of spike damage levels in millet. Conference on Crop Loss Assessment, Oct 7-14, 1996, Niamey, Niger. Oregon State University Integrated Plant Protection Center Web Site: <http://osu.orst.edu/dept/ippc/GH>

14. Riedl, H. and **L. B. Coop**. 1996. Phenology model for Cherry Fruit Fly in Hood River and the Dalles. Cherry Commission Progress Report, Oct. 2, 1996. Oregon State University Integrated Plant Protection Center Web Site: <http:/ippc2.orst.edu/cff/cffmod1.htm> *Role: developed model and delivery platform*

13. **Coop, L. B.** 1995. Survey of integrated pest management in apple: range of practices and level of adoption. IPPC Oregon State Univ. 38 pp.

12. Croft, B. A. and **L. Coop**. 1995. IPM of spider mites on strawberry using the biological control agent: *Neoseiulus fallacis*. NW Small Fruit Conference. p. 14. *Role: collected field data, developed dispersal model*

11. **Coop, L. B.**, B. A. Croft. 1995. The influence of dispersal by the predator mite *Neoseiulus fallacis* on biological control of spider mites in strawberry. Ore. Hort. Soc. Proc. 86:149-159.

10. **Coop, L. B.**, B. A. Croft, H. Riedl, and E. C. Burts. 1994. Geographic information systems and simulation in regional orchard management: pesticide resistance in Hood River Valley, Oregon. Acta Horticulturae 367:383-390.

9. **Coop, L. B.**, B.A. Croft, and J.C. Miller. 1994. Effects of *Bacillus thuringiensis* kurstaki on non-target Lepidoptera and spiders - Semi-field test. Report submitted to EPA.

8. **Coop, L. B.**, B. A. Croft, H. Riedl. 1994. Pear Psylla development of pyrethroid resistance: geographic information systems analysis. Proc. Internat. Colloq. Integrated Control In Pear Orchards. Cesena, Italy. Bulletin IOBC (International Organization For Biological Control), WPRS (West Palearctic Regional Section). 17:43-47.

7. Dively, G. P. and **L. B. Coop**. 1992. Millet loss assessment project, Mali, 1990. Project Report. Submitted to United States Agency for International Development Africa Bureau, Washington D.C. Jan. 1992. *Role: Project supervisor, data analysis, content, edits*

6. **Coop, L. B.**, and B. A. Croft. 1992. Decision tools for grasshopper control. Project report. Submitted to United States Agency for International Development Africa Bureau, Washington, D.C. July 1992.

5. **Coop, L. B.**, B. A. Croft. 1990. GHLSIM: Sahelian grasshopper/crop loss simulation. Workshop on modeling pest-crop Interactions. International Benchmark Sites Network for Agrotechnology Transfer. University of Hawaii Research Extension Series 120:30-31.

4. **Coop, L. B.**, B. A. Croft, C. Murphy and S. Miller. 1989. Economic analysis of African locust/grasshopper control. Part I. GHLSIM technical reference. IPPC Oregon State Univ. 35 pp.

3. **Coop, L. B.**, B. A. Croft, C. Murphy and S. Miller. 1989. Economic analysis of African locust/grasshopper control. Part II. GHLSIM user manual. IPPC Oregon State Univ. 44 pp.

2. **Coop, L. B.**, B. A. Croft, C. Murphy and S. Miller. 1989. Economic analysis of African locust/grasshopper control. Part III. Analysis of the 1987 grasshopper campaign in Chad. IPPC Oregon State Univ. 56 pp.

1. Fisher, G., B. Croft, **L. Coop** and R. Drapek. 1988. Corn earworm pest management. Proc. Oregon Hort. Soc. 79:165-171. *Role: data collection and analysis, modeling, model delivery platform*

b. Other Publications

Summary of other publications

Time frame	Newsletters	Trade/ industry	Web sites and	TOTAL

		articles	software	
Since 2020	0	1	19	20
2002 - 2019	0	7	24	31
Prior to 2002	3	0	22	25
TOTAL	**3**	**8**	**65**	**76**

i. Newsletters

3. Coop, L., P. Jepson. 2003. Supplement to Oregon IPM Newsletter: On-line, Site Specific Degree-Day Predictions Using GIS and Climate Map Technologies. Oregon State University: Integrated Plant Protection Center. April, 2003 - [cited August 8th, 2003]. Available from Internet: http://oregonipm.ippc.orst.edu/On-Line%20DD.pdf

2. Drapek, R, L.B. Coop. 1990. Corn earworm report newsletter IV (1-3). OSU Extension Entomology. *Role: project supervision, data collection, content, modeling*

1. Coop, L.B., R. Drapek. 1989. Corn earworm report newsletter III (1-4). OSU Extension Entomology.

ii. Trade/industry articles

8. Crimmins, T., E. Posthumus, A. Rosemartin, B. Barker, and L. Coop. 2023. Enhanced forecasts of emerald ash borer activity. City Trees. July-Aug 2023. pp. 12-13. <https://read.dmtmag.com/i/1502619-july-august-2023/0?> *Role: lead modeling, model implementation, edits*

7. Parke, J., C. Mallory-Smith, M. Dragila, B. Hill, N. Wada, C. Weidman, L. Coop, K. Buckland. 2018. Soil Solarization – A potential tool for organic growers to manage weeds and improve soil health. Organic Farmer Magazine. Dec 2018-Jan 2019. pp 12-18. <**https://www.yumpu.com/en/document/fullscreen/62280511/organic-farmer-dec-jan-2019**> *Role: supervised modeling, data management for modeling, edits*

6. Coop, L. B. 2017 Cloudy, with a chance of insects. Scientia. May 1, 2017. **https://www.scientia.global/dr-leonard-bryan-coop-cloudy-chance-insects/**

5. Andrews, N., Noordijk, H., Coop, L. B. (2016). Croptime: Scheduling Vegetables with Degree-Day Models. *Oregon Small Farm News* (1st ed., vol. XI, pp. 11-14). Corvallis, OR: OSU Extension - Small Farms. <**http://smallfarms.oregonstate.edu/sites/default/files/sfnarchive_img/sfnwinter2016.pdf** > *Role: modeling, edits*

4. Andrews, N., L. Coop, and H. Noordijk. 2015. Scheduling vegetables using degree-days. New crop planning, planting model from Oregon State University. Tilth Producers Quarterly 25:4:1-6. Access online via: <http://tilthproducers.org/quarterly/2015-25-4-scheduling-vegetables-using-degree-days/> *Role: modeling, edits*

3. Coop, L. 2014. The Best/Worst Time for Pathogens. New, weather-driven risk models indicate when box blight and apple scab are more likely to spread. Growing Knowledge Article in Digger Magazine Pub. by The Ore. Assoc. of Nurseries. Oct. 2014. Online at: <http://c.ymcdn.com/sites/www.oan.org/resource/resmgr/Digger2/Digger201410OSU.pdf>

2. Coop, L. and A. J. Dreves. 2013. Predicting when spotted wing Drosophila begins activity using a degree-day model. Whatcom Ag Monthly. Vol. 2 Issue 3 pp. 2-7. Online at: <http://whatcom.wsu.edu/ag/documents/newsletters/v2i3_2013MarchWCENewsletter.pdf>

1. Croft, B.A. and L.B. Coop. 1994. IPM of spider mites on strawberry using the biological control agent *Neoseiulus fallacis*. Northwest Small Fruit Research 2:62-63. *Role: data collection and analysis, modeling, content, edits*

iii. Web-sites, apps, webinars, and software

65. Coop, L., and Barker, B. S. Version 2 of a degree-day/phenological model for emerald ash borer, online May 10, 2023 at: https://uspest.org/cgi-bin/ddmodel.us?spp=eab2

64. Coop, L. 2022. Emerald ash borer spatial model for Oregon - online mapping interface. Available at: https://uspest.org/CAPS/EAB_OR/home.html

63. Upper, D. and L. Coop. 2022. Push email delivery system for custom degree-day models: Users can specify custom thresholds and other degree-day modeling parameters and receive email “push” notifications of model predictions. Available at <https://uspest.org/cgi-bin/account> Released on Feb 1, 2022] *Role: Supervised infrastructure construction and programming, advised on design and test procedures, coordinate and conduct end-user usability tests.*

62. Upper, D. and L. Coop. 2021. Watermelon Melcast Infection Risk model app Available at <https://uspest.org/risk/melcast_water_app> Released on Sept. 20, 2021 *Role: Supervised infrastructure construction and programming, advised on design and test procedures, coordinate and conduct end-user usability tests.*

61. Upper, D. and L. Coop. 2021. Muskmelon Melcast Infection Risk model app Available at <https://uspest.org/risk/melcast_musk_app> Released on Nov. 1, 2021 *Role: Supervised infrastructure construction and programming, advised on design and test procedures, coordinate and conduct end-user usability tests.*

60. Upper, D. and L. Coop. 2021. Dollar spot Infection Risk model app Available at <https://uspest.org/risk/dollar_spot_app> Released on Sept. 20, 2021 *Role: Supervised infrastructure construction and programming, advised on design and test procedures, coordinate and conduct end-user usability tests.*

59. Upper, D. and L. Coop. 2021. Push email delivery system for degree-day and hourly weather-driven models: 143 models total, by category: 77 insect models (total), 27 Invasive insect models, 29 vegetable crop models, 17 agronomic crop models, 7 plant disease models, 5 weed models, plus 8 plant disease infection risk models: Apple scab, boxwood blight, cherry powdery mildew, fire blight, grape powdery mildew, hop powdery mildew (2 vars), pear scab, and potato-tomato late blight infection risk models. Available at <https://uspest.org/cgi-bin/account> Released on July 1, 2021 *Role: Supervised infrastructure construction and programming, developed most all models, advised on design and test procedures, coordinate and conduct end-user usability tests.*

58. Coop, L., and B. S. Barker. 2020. Computing infrastructure requirements and user guide for hosting DDRP models. Prepared for APHIS PPQ and other collaborators. Available at: https://uspest.org/CAPS/ and at https://github.com/bbarker505/ddrp_v2 *Role: Wrote first edition, co-wrote 2nd edition.*

57. Upper, D. and L. Coop. 2020. Push email delivery system for plant disease model apps: 1) Apple scab, 2) boxwood blight, 3) cherry powdery mildew, 4) fire blight, 5) grape powdery mildew, 6) hop powdery mildew (2 vars), 7) pear scab, and 8) potato-tomato late blight infection risk models. Available at <https://uspest.org/cgi-bin/account> Released on Dec. 17, 2020] *Role: Supervised infrastructure construction and programming, advised on design and test procedures, coordinate and conduct end-user usability tests.*

56. Wepprich, T., L. Coop, B. Barker and F. Grevstad. 2020. Biological control voltinism mismatch maps using DDRP. Model interface for three weed biological control insect species.

Available at <https://uspest.org/dd/dodmaps> Released Oct, 2020] Role: Designed and built web page, co-developed modeling platform.

55. Upper, D. and L. Coop. 2020. Potato-Tomato Late Blight Infection Risk Index model app Available at <https://uspest.org/risk/ptlb_app> Released on July 6, 2020] *Role: Supervised infrastructure construction and programming, advised on design and test procedures, coordinate and conduct end-user usability tests.*

54. Coop, L., B. Barker. 2020. Home page and directory of selected Degree-Day, establishment Risk, and Pest event maps (DDRP). Available at <https://uspest.org/CAPS> Released July, 2020] *Role: Designed and built web page, co-developed models.*

53. Upper, D. and L. Coop. 2020. Grape Powdery Mildew Infection Risk Index model app Available at <https://uspest.org/risk/grape_powdery_app> Released on July 6, 2020] *Role: Supervised infrastructure construction and programming, advised on design and test procedures, coordinate and conduct end-user usability tests.*

52. Upper, D. and L. Coop. 2020. Fireblight Infection Risk Index model app Available at <https://uspest.org/risk/fbl_app> Released on July 6, 2020] *Role: Supervised infrastructure construction and programming, advised on design and test procedures, coordinate and conduct end-user usability tests.*

51. Upper, D. and L. Coop. 2020. Cherry Powdery Mildew Infection Risk Index model app Available at <https://uspest.org/risk/cherry_powdery_app> Released on July 6, 2020] *Role: Supervised infrastructure construction and programming, advised on design and test procedures, coordinate and conduct end-user usability tests.*

50. Upper, D. and L. Coop. 2020. Pear Scab Infection Risk Index model app Available at <https://uspest.org/risk/pear_scab_app> Released on July 6, 2020] *Role: Supervised infrastructure construction and programming, advised on design and test procedures, coordinate and conduct end-user usability tests.*

49. Upper, D. and L. Coop. 2020. Apple Scab Infection Risk Index model app Available at <https://uspest.org/risk/apple_scab_app> Released on July 6, 2020] *Role: Supervised infrastructure construction and programming, advised on design and test procedures, coordinate and conduct end-user usability tests.*

48. Andrews, N. and L. Coop. 2020. Digital Extension: Oregon State's IPM portal. Webinar, June 30, 2020, Episode 11, Farming Fast and Slow. Adam Wolf, host, Arable.com. Available on YouTube: <https://youtu.be/6ZAm57Bv22w>

47. Andrews, N., L. Coop, H. Stoven, and H. Noordijk. 2020. Beans, *Phaseolus vulgaris* L., Vegetable Phenology (Degree-Day) Model Documentation. version 1.0, OSU Oregon IPM Center and Dept. Horticulture CROPTIME project. Online at: <https://uspest.org/CROPTIME/bean_varieties_models.pdf> (last accessed 1/15/2021) *Role: modeling supervisor, writing, editing*

46. Andrews, N., L. Coop, H. Stoven, and H. Noordijk. 2019. Sweet corn, *Zea mays* L., Vegetable Phenology (Degree-Day) Model Documentation. Version 1.0, 10/21/2019. OSU Oregon IPM Center and Dept. Horticulture CROPTIME project. Online at: <https://uspest.org/CROPTIME/sweetcorn_varieties_models.pdf> *Role: modeling supervisor, writing, editing*

45. Upper, D., D. Gent, and L. Coop. 2019. Hop Powdery Mildew Risk Index model app (Web version to be released on Android and Apple mobile devices). Available at <http://uspest.org/risk/hpm_app> [Beta/test version: available July 26, 2019] *Role: Supervised infrastructure construction and programming, advised on design and test procedures, build mobile app (play store) versions.*

44. Stoven, H., L. Coop, N. Andrews, H. Noordijk. 2019. Tomato, *Solanum lycopersicum*, Vegetable Phenology (Degree-Day) Model Documentation. Version 1.0, 2/13/2019. OSU Integrated Plant Protection Center and Dept. Horticulture CROPTIME project. Online at: <https://uspest.org/CROPTIME/tomato_varieties_models.pdf> *Role: modeling supervisor, writing, editing*

43. Coop, L, and D. Upper. 2019. Multi-species degree-day model app for Android mobile devices. Online at: <https://uspest.org/dd/model_app> Available at the Google Play Store [First version: available Jan 23, 2019]

42. Coop, L., D. Upper, and A. Fox. 2018. Access to weather station-based data of extended forecasts using NMME and CFSv2 models for degree-day and other daily temperature forecast needs. Access index at: <http://uspest.org/wea/indextable.html#tables> [forecasts updated monthly; first online March 2016]

41. Coop, L., and D. Upper. 2018. Boxwood blight risk model app for Apple mobile devices. Available at the Apple App Store [First version: online May 31, 2018]

40. Coop, L., and D. Upper. 2018. Boxwood blight risk model app for Android mobile devices. Available at the Google Play Store [First version: online Apr. 12, 2018]

39. Pfender, W. F., L. B. Coop, D. Upper, J. McQueen. Grass Stem Rust Decision Aid – revised 2018. Oregon State University Integrated Plant Protection Center Web Site Publication E.18-04-1: <http://uspest.org/cgi-bin/stemrust1.pl> [first version online 2004] *Role: model platform development, supervision of programmer*

38. Coop, L. 2017. Vapor Drift Risk Model: Predicting Thermal or Vapor Drift from Temperature and Dewpoint. Integrated Plant Protection Center Web Site Publication E. 16-01-1: <http://uspest.org/risk/models > [first version online 2010]

37. Coop, L. B. 2017. US degree-day mapping calculator vII. New version and infrastructure coded in R and GRASS GIS for 48 state online degree map mapmaking. Version II.01. Oregon State University Integrated Plant Protection Center Web Site: <http://uspest.org/dd/mapper > [first version online 2017]

36. Coop, L. B., D. Upper, F. Funahashi, and J. Parke. 2016. Soil Solarization Program – for using transparent anti-condensation plastic film to manage two soil-borne plant pathogens: *Phytophthora ramorum* and *P. pini*, developed for nursery beds. Version 0.91. Oregon State University Integrated Plant Protection Center Web Site: <http://uspest.org/soil/solarize > [first version online 2016]

35. Coop, L. B., D. Upper, and N. Andrews. 2016. CROPTIME: phenology models to schedule vegetable plantings and harvests. Version 1.01. Oregon State University Integrated Plant Protection Center Web Site: <http://uspest.org/dd/model?mdt=veg > [first version online 2015]

34. Coop, L., D. Debrito, D. Upper. 2016. MyPest Page: Hourly Weather, Plant Disease Risk, and Degree-day/Phenology Models. Integrated Plant Protection Center Web Site Publication E. 16-01-1: <http://uspest.org/risk/models > [first version online 2010]

33. Coop, L. B., G. Cook. 2016. US Degree-Day/Risk/Pest Event Mapmaker (DDRP): degree-day, pest/phenology event, and climate exclusion maps. Version 0.95. Oregon State University Integrated Plant Protection Center Web Site: <http://uspest.org/dd/maps > [first version online 2015]

32. Pfender, W. F., L. B. Coop, D. Debrito. Grass Stem Rust Estimator - 2016 version. Oregon State University Integrated Plant Protection Center Web Site Publication E.16-07-1: <http://uspest.org/cgi-bin/stemrust1.pl> [first version online 2004] *Role: programming supervisor, developed modeling platform*

31. Coop, L. B., A. Dreves, and P. Jepson. 2016 version. Western Specialty Crops ipmPIPE – Spotted Wing Drosophila Decision Tools. Pest Incidence, Phenology and Overwintering Mortality Models. <http://uspest.org/swd > [first version online 2013]

30. Coop, L. B. 2016. Online phenology degree-day models. 2016 version. Oregon State University Integrated Plant Protection Center Web Site: <http://uspest.org/cgi-bin/ddmodel.us > [first version online 2013]

29. Coop, L., D. Debrito, D. Upper. 2016. MyPest Page: Plant Disease Risk Maps for Selected Regions. Integrated Plant Protection Center Web Site Publication E. 16-07-1: <http://uspest.org/risk/grid_display > [first version online 2012]

28. Coop, L. B. 2016. U. S. degree-day mapping calculator. Version 6.0. Oregon State University Integrated Plant Protection Center Web Site Publication E.16-03-1: <http://uspest.org/cgi-bin/usmapmaker.pl > [first version online 1998]

27. Coop, L. B. 2009. Online pest and disease models homepage for Milton-Freewater, Oregon. Oregon State University Integrated Plant Protection Center Web Site: <http://uspest.org/MF > [updated regularly to the present]

26. Coop, L. B. and J. Stone. 2008. Douglas fir: Swiss needle cast risk model – Online mapping and model visualization. A climate and terrain based model of swiss needle cast severity. <http://uspest.org/snc> [last updated 2008]

25. Coop, L. B. 2008. Daily and interactive degree-day maps for the USA. Oregon State University Integrated Plant Protection Center Web Site: <http://uspest.org/wea/indextable.html > [updated regularly to the present]

24. Coop, L. B. 2005. Web Publishing System for Pacific Northwest Weed Managment Handbook. 2005 Edition. William, R. Lead Editor. OSU Extension / Integrated Plant Protection Center Web Site Publication E.05-05-1: <http://pnwpest.org/pnw/weeds > [updated yearly 2001-2010]

23. Coop, L. B. 2004. IPM Centers - Pacific Northwest Coalition Portal website. Oregon State University Integrated Plant Protection Center Web Site: <http://pnwpest.org/pmc/index.pl > [updated 2002-2005]

22. Coop, L. B. 2002. Online pear scab and powdery mildew risk model summaries for Hood River and Medford, Oregon. Oregon State University Integrated Plant Protection Center Web Site (e.g. Hood River: <http://pnwpest.org/hr > [updated regularly to the present]

21. Coop, L. B. 2002. MINTSIM - simulation model of Variegated Cutworm injury and economic thresholds in Peppermint (Pascal). PC & Web software. Most recent version completed 2002. Released as part of IPMP 2.0 and 3.0., Online at <http://mint.ippc.orst.edu/msim.html > [nominally updated to the present]

20. Coop, L. B. 2002. IPPC Grasslinks 3.2b: Public Access GIS. Web interface to maps, databases, and Geographic Information Systems analysis. <http://ippc2.orst.edu/glinks > [updated regularly to the present]

19. Coop, L. B. 2002. Web Publishing System for Pacific Northwest Insect Managment Handbook. McGrath, D. Lead Editor, 2002-2007; Hollingsworth, C. Lead Editor, 2008-2012. OSU Extension / Integrated Plant Protection Center Web Site Publication E.02-02-1: <http://pnwpest.org/pnw/insects > [published yearly 2002-2012]

18. Berry, R. E and L. B. Coop. 2001. Integrated Pest Management on Peppermint - IPMP 3.0. Oregon State University Integrated Plant Protection Center Web Site Publication E.01-01-1: <http://mint.ippc.orst.edu > [updated to the present] *Role: modeling, programming, website developer*

17. Coop, L. B. 2001. Web Publishing System for Pacific Northwest Weed Managment Handbook. William, R. D. Lead Editor. OSU Extension / Integrated Plant Protection Center Web Site Publication E.01-04-1: <http://pnwpest.org/pnw/weeds > [published yearly 2001-2011]

16. Coop, L. B. 2000. Downscaling algorithm and preliminary documentation for improving resolution of climate maps. IPPC web site <http://ippc2.orst.edu/dscale/ >

15. Berry, R. E, G. L. Reed and L. B. Coop. 2000. Identification and Management of Major Pest and Beneficial Insects in Potato. Oregon State University Integrated Plant Protection Center Web Site Publication E.04-00-1: <http://ippc2.orst.edu/potato > *Role: edits and website developer*

14. Coop, L. B. 1999. Phenology Models Research and Delivery for Areawide Tree Fruit IPM. Area Wide Codling Moth Project Report - 1999. Oregon State University Integrated Plant Protection Center Web site: <http://osu.orst.edu/dept/ippc/wea/phenolrpt99.html >

13. Coop, L. B. 1999. Area Wide Codling Moth Project Program Evaluation - 1 page grower survey - 1995-1998 Area Wide Codling Moth Project Report - 1999. Oregon State University Integrated Plant Protection Center Web site: <http://ippc.orst.edu/IPMsurvey/camp/campsurvrpt99.html >

12. Coop, L. B. 1999. Online phenology models and degree-day calculator. Version 2.0. Oregon State University Integrated Plant Protection Center Web Site: <http://ippc2.orst.edu/cgi-bin/ddmodel.pl >

11. Coop, L. B. 1998. Oregon degree-day mapping calculator. Version 1.0. Oregon State University Integrated Plant Protection Center Web Site Publication E.98-00-1: <http://ippc2.orst.edu/cgi-bin/mapmaker.pl> [updated regularly to the present, now at: <http://uspest.org/cgi-bin/usmapmaker.pl >]

10. Coop, L. B. 1998. Online IPM weather data and degree-days for pest management decision making in Oregon. Oregon State University Integrated Plant Protection Center Web Site: <http://www.orst.edu/Dept/IPPC/wea> [updated regularly to the present, now at: <http://uspest.org/wea >]

9. Coop, L. B. and D. Upper. 1998. Online daily degree-day maps of Oregon. GIS/mapping and degree-day modeling system for Oregon. Oregon State University Integrated Plant Protection Center Web Site: <http://uspest.org/wea/ddmaps.html > [updated daily to the present]

8. Coop, L. B. 1998. Oregon pear growers survey (online database analysis system). Oregon State University Integrated Plant Protection Center Web Site: <http://ippc.orst.edu/IPMsurvey/cfgph/pearsurvey.cfm > [available 1998-2012; currently off-line]

7. Coop, L. B., R. Rosetta, and B. A. Croft. 1997. Release calculator and guidelines for *Neoseiulus fallacis* to control two-spotted spider mites in strawberry. Oregon State University Dept. of Entomology Web Site: <http://www.orst.edu/Dept/entomology/ipm/mcalc.html> [nominally updated, now at <http://uspest.org/ipm/mcalc.html >]

6. Coop, L. B., R. E. Berry, G. Fisher, and M. Kogan. 1997. Insect pest management in peppermint (IPMP) - online version 1.0. Oregon State University Integrated Plant Protection Center Web Site: <http://www.orst.edu/Dept/entomology/ipm/ipmp2.html> [nominally updated; now at <http://mint.ippc.orst.edu >]

5. Coop, L. B., R. E. Berry, G. Fisher, and M. Kogan. 1995. Insect pest management in peppermint (IPMP) - version 2.0. Computer Software Publication CS195. Integrated Plant Protection Center. Oregon State University. [PC software; replaced by online version]

4. Coop, L. B., R. Drapek, B. Croft and G. Fisher. 1990. CEWSIM: Corn Earworm Damage Simulator. Simulation model and decision support software for corn earworm in sweet corn.

Version 1.5 User's manual. OSU Extension Entomology. 20 pp. [PC software; no longer available]

3. Berry, R. E., L. B. Coop and J. Duvall. 1989. IPMP - Insect pest management in peppermint. Users Guide. OSU Special Pub. No. 834. [initial release of PC software] *Role: modeling, website developer*

2. Coop, L. B. 1989. GHLSIM - simulation model/database system for grasshopper/locust damage to millet (West Africa) (Pascal). [PC software Submitted to USAID/Africa Bureau]

1. Coop, L.B., Drapek, R., B.A. Croft and G. Fisher. 1989. CEWSIM: Corn Earworm Damage Simulator. Version 1.1 Users manual. OSU Extension Entomology. 20 pp. [initial release of PC software]

2. Presentations to peers

Summary table of presentations to peers at professional meetings

Year	Within Region	National	International	TOTAL	No. invited
2023	2	1	0	3	3
2022	5	4	4	13	9
2021	1	3	1	5	3
2020	2	0	0	2	0
2019	2	0	0	2	1
2018	0	3	2	5	1
2003-2017 (TOTAL)	15	24	11	50	10
1990-2002 (TOTAL)	10	4	14	28	10
All years TOTAL	**37**	**39**	**32**	**108**	**37**

107. **Coop**, L. and B. Barker. 2023. Phenological mapping approaches for IPM decision support. Invited talk presented Apr. 3, 2023 at the Pacific Branch Entomological Society of America. Annual Meeting, Seattle, WA. Regional. Invited.

106. **Coop**, L. 2023. Building a multi-state decision support system: 25 years at uspest.org. Invited talk presented Apr. 5, 2023 at the Pacific Branch Entomological Society of America. Annual Meeting, Seattle, WA. Regional. Invited.

105. Barker, B. S., Coop, L., Rosemartin, A., and Crimmins, T. 2023. Updates and implementation of a spatialized phenology model for emerald ash borer. Oral presentation at the Pacific Northwest Insect Management Conference, Jan. 9, 2023. Portland, OR. ca. 40 attendees. NIFA Support Acknowledged.

104. **Coop, L.** and B. Barker. 2022. Models for boxwood blight infection and establishment risk. Oct. 16, 2022. Boxwood Blight Insight Group. Invited, International. 14 participants. Online at https://drive.google.com/drive/folders/1dHByRoWQ-I_c8djTjFWOw11tXzJzovh_

103. Coop, L. and B. Barker. 2022. Boxwood blight modeling: how weather and climate influence disease. Western Horticultural Inspection Society (WHIS) Annual Meeting. Oct. 6, 2022. Invited, National. 106 participants.

102. Coop, L. 2022. Potato-tomato psyllid phenological modeling. Lincoln University Plant Science Dept. Seminar. New Zealand. Sept. 11, 2022. Online, Invited, International, 45 participants. Excerpts online at: https://www.youtube.com/watch?v=ykWk7Zuf1Oo

101. Coop, L. and B. Barker. 2022. How do weather and climate impact boxwood blight? A modeling approach to aiding in boxwood disease management. American Horticulture Society tHRIve web series. Sept 7, 2022. Invited, National. Online at: https://www.boxwoodhealth.org/knowledge-center

100. **Coop, L.** and B. Barker. 2022. Boxwood blight management: a decision support tool for infection and establishment risk. American Phytopathological Society Annual Meeting. Pittsburgh, PA. Aug 7, 2022. Available on-line at: https://uspest.org/ipm/Coop_Barker_Pittsburgh_Presentation_Recording_1920x1022.mp4 Invited, National.

99. Barker, B. S., **Coop, L.**, and T. Crimmins. 2022. DDRP: a modeling tool to forecast insect phenology and risk of establishment. Oral presentation at the Ecological Forecasting Initiative conference, May 23, 2022. Online. Invited.

98. Coop, L, S. Dorman, J. Green. 2022. Decision support tools and data visualization. Oral presentation at the Fourth annual Oregon IPM summit, Corvallis, OR Mar. 14, 2022. Invited. ca. 25 attendees. NIFA Support Acknowledged

97. Barker, B.S, **Coop, L**., and Crimmins, T. 2022. DDRP: a modeling tool to guide decision making for pest surveillance and management. Poster presentation. 10th International IPM Symposium, Denver, CO, Mar 2, 2022. Available online at: https://ipmsymposium.org/2021/posters.html 300 attendees.

96. **Coop, L.**, B. Barker, and C. Hong. 2022. Integrating short and long term risk models for boxwood blight. Poster presentation. 10th International IPM Symposium, Denver, CO, Mar 2, 2022. Available online at: https://ipmsymposium.org/2021/posters.html 300 attendees.

95. **Coop, L.**, D. Upper. 2022. Degree-day models, apps, and „push" email notifications for IPM and invasive pests. Oregon State Agency IPM Coordinating Committee Semiannual Meeting. Feb. 2, 2022, online event. 13 attendees.

94. Barker, B., **L. Coop**. 2022. DDRP: phenology and climate suitability modeling to predict when and where invasive and IPM pests can arise. Oregon State Agency IPM Coordinating Committee Semiannual Meeting. Feb. 2, 2022, online event. 13 attendees.

93. **Coop, L.**, C. Hedstrom, D. Upper. 2022. A new „push" email delivery system for pest and crop models. 81st Annual Pacific Northwest Insect Management Conference. Jan. 10, 2022, online event. 95 attendees.

92. Barker, B., **L. Coop**, T. Crimmins. 2022. Expanding a spatial modeling platform with emphasis on invasive insects, plant diseases, and weeds. 81st Annual Pacific Northwest Insect Management Conference. Jan. 10, 2022, online event. 95 attendees.

91. Andrews, N., **L. Coop**. 2021. Croptime: Scheduling harvests and timing of weed management. Pacific Northwest Vegetable Conference. Nov. 17, 2021, Kennewick, WA. Regional; Invited. 70 attendees.

90. Barker, B., **L. Coop**, and C. Hong. 2021. Risk modeling to predict outbreaks and establishment of invasive plant pathogens: a case study of boxwood blight. Poster presented Sept. 8, 2021 at the Ecological Society of America Annual Meeting.

89. **Coop, L.**, and B.S. Barker. 2021. Predicting boxwood blight infection and establishment risk using CLIMEX, correlative, and DDRP modeling platforms. Online presentation at the 2nd Boxwood Blight Epidemiologist's Meeting, Oct. 25, 2021. Remote; International; Invited.

88. Barker, B.S., **L. Coop**, and T. Wepprich. 2021. Modeling phenology and climate suitability of invasive insects in real-time to improve surveillance and management. Oral presentation at the Entomological Society of America Conference (given remotely), Oct. 13, 2021. Denver, CO. Invited.

87. **Coop, L.** and B.S. Barker. 2021. Forecasting systems for boxwood blight – when and where to be on alert. Oral presentation at Cultivate 21 - AmericanHort, July 11, 2021. Columbus, OH. Invited. Recorded later and online at: https://www.boxwoodhealth.org/knowledge-center also archived at: https://uspest.org/ipm/Len_Coop_Boxwood_Blight_Columbus_OH_July_2021.mp4

86. **Coop, L.** and B. S. Barker. 2020. A new phenology model for bronze birch borer. 79th Pacific Northwest Insect Management Conference. Portland, OR. Jan 7, 2020.

85. Barker, B., **L. Coop**, T. Wepprich, and F. Grevstad. DDRP: A new platform to model phenology and risk of establishment. 79th Pacific Northwest Insect Management Conference. Portland, OR. Jan 7, 2020.

84. **Coop, L.** 2019. Implementing season-long weather and climate forecasts for pest and crop phenology models. Climate change impacts on IPM – Symposium at: 103rd Ann. Meeting of the Pacific Branch of the ESA. Apr. 2, 2019. San Diego, CA. **Invited.**

83. **Coop, L. B.** Barker, T. Wepprich, and F. Grevstad. 2019. DDRP: Modeling Degree-Days, Risk of Establishment, and Phenological Event Maps. Poster presented at Pacific Branch ESA Annual Meeting, Apr. 2, 2019, San Diego, CA. Available at: http://uspest.org/ipm/Coop_etal_DDRP_platform_ESA_Pacific_March_2019.pdf

82. Grevstad, F., T. Wepprich, D. Bean, and **L. Coop.** 2018. Incorporating photoperiodism in insect phenology models. Poster presentation at: DoD SERDP Conference and meeting Nov 28, 2018. Washington, D.C. *Role: contributed slides and comments on phenology models and maps*

81. **Coop. L.** 2018. Concepts of systems modeling in agroecosystems. Seminar/class at Oklahoma State NIMFFAB. Oct. 12, 2018. Stillwater, OK (via Zoom). Online at: **<https://uspest.org/okstate/Systems_Modeling_Oct_2018b.pdf > Invited.**

80. **Coop, L.** 2018. Boxwood blight infection risk model – when and where to be on alert. International Congress of Plant Pathology. Presentation. Boston, MA, July 31, 2018. **Invited.**

79. **Coop, L.** A. Fox, and P. Jepson. 2018. Weather and Climate driven models for IPM and invasive species management. Poster presented at 9th International IPM Symposium, Mar. 21, 2018, Baltimore, MD. Online at: <http://uspest.org/ipm/P4_Weather_and_Climate_Driven_Models_for_IPM.pdf>

78. Bean, D., T. Dudley, F. Grevstad and L. Coop. 2018. How Two Generations Became Six: Evolving Photoperiod Cues and Shifting Temperature Regimes Alter the Life History and Phenology of *Diorhabda carinulata*, a Biocontrol Agent for *Tamarix* spp. Presented at the annual Riparian Restoration Conference, sponsored by the Tamarisk Coalition and the Water Center at Colorado Mesa University, Grand Junction, CO, Feb. 6, 2018. *Role: contributed slides and phenology modeling*

77. **Coop, L.** 2017. Systems modeling of crop and insect development for agricultural decision support. Horticulture Dept. Seminar. Oct. 24, 2017. Corvallis, OR. Online at: <**https://media.oregonstate.edu/media/t/0_72jrm3vb/80127602** > **Invited.**

76. Bean, D., Dudley, T. Grevstad, F. and **Coop, L.** 2017. Rapidly evolving responses to photoperiod cues allow phenology shifts and southward range expansion in *Diorhabda carinulata*, a biocontrol agent for *Tamarix.* A presentation for the symposium Tamarisk: from organism to landscape 14th Biennial Conference of Science and Management for the Colorado Plateau and Southwest Region, Flagstaff, AZ, Sept. 13, 2017. *Role: contributed phenology models and supporting slides*

75. Grevstad, F., **L. Coop**, D. Bean. 2016. Incorporating photoperiodism in insect phenology models with application for the biological control of weeds on DoD lands. Presentation at Dept. Of Defense, Sept. 14, 2016. Arlington, VA. *Role: contributed phenology models, analysis, and slides*

74. **Coop, L.**, A. Fox, C. Daly. 2016. Update on weather and climate data and models at USPEST.ORG. Presentation at Combined Weather Workgroup Meeting, Aug. 4, 2016. Tampa, FL. **Invited.**

73. **Coop, L.**, A. Fox, G. Grove, A. Dreves. 2016. Extended forecasts for IPM Decision Making. NIFA-CPPM-ARDP Grant Report at WERA-1017: Western Region IPM Coordinators Meeting. July 8, 2016. Boise, ID.

72. **Coop, L.** and G. Cook. 2015. DDRP Mapping: Degree-day, Risk, and Pest Event Maps. Talk. USDA-APHIS-PPQ-CPHST. Dec. 9, 2015. Ft. Collins, CO. **Invited.**

71. **Coop, L.** 2015. Pest Phenology Model Development & Online Tools. Oregon Agric. Extension Assoc. Presentation. Apr 28, 2015, Medford, OR. **Invited.**

70 **Coop, L.** 2015. NW Pest Prediction Models Using Weather Data. IR-4 State Commodity Liaison Meeting. Presentation. Apr 22, 2015, Portland, OR. **Invited.**

69. **Coop, L.** 2015. Oregon IPM Coordinators Report 2015. WERA-1017 National and Western Region IPM Coordinators meetings. Mar 23, 2015. Salt Lake City, UT.

68. **Coop, L.** 2014. Phenology model for the omnivorous leaftier, *Cnephasia longana*: reviving intensive research from a bygone era. Presentation at ESA National Meeting, Portland, OR, Nov. 23, 2014.

67. Kaiser, C., Christensen, J.M., **Coop, L.** and Masterson, K., 2014. Collaboration and Grant Writing in County Extension. OSUEA Annual Conference, Corvallis, OR – Sept 2014. Presentation. **Invited.** *Role: provided feedback and edits*

66. Kaiser, C., **Coop, L.** and Meland, M., 2014. Developing a robust, predictive model for sweet cherry (Prunus avium L.) flowering, comparing eastern Oregon and mesic Nordic climates. ASHS Annual Conference. July 22-29, 2014. Orlando, FL. *Role: contributed model analysis and final model results and commentary*

65. Kaiser, C. and **Coop, L.**, 2014. Camp program in the Walla Walla Valley. NACAA Annual Conference, July 19-24, 2014. Mobile, AL. (Presentation for National Award – Search for Excellence). *Role: provided models, mapping of pheromone trap results, and slides*

64. **Coop, L.** 2014. Oregon IPM report. WERA-1017 Western Region IPM Coordinators meeting Western Region. July 7, 2014. Bozeman MT.

63. **Coop, L.** 2014. Boxwood Blight: Epidemiology and Monitoring. Developing a Predictive Model for the United States. 2014 Boxwood Summit. May 13, 2014. Beltsville, Maryland. **Invited.**

62. **Coop, L.**, F. Grevstad, and G. Cook. 2014. Pest event mapping: a new tool to aid in prediction of insect phenology. Presentation and paper presented at: Pacific Northwest Insect Management Conference. Jan. 6, 2014, Portland, OR Online at: https://uspest.org/ipm/Coop_et_al_PNWIMC_20140106_paper.pdf

61. Thomas, C. **Coop. L.** Mahaffee, W. Pfender, W. Fox, A. Daly, C, Johnson, D. Gent, D. Gubler, W. NcRoberts, N. Hoogenboom, G. 2013. Update on the Western Weather Work

Group. Presentation at North Central Weather Workgroup Meeting, Aug. 9, 2013. Austin, TX. *Role: provided model analysis, example modeling products, and edits*

60. **Coop, L.** et al. 2013. Spotted Wing Drosophila phenology and overwintering mortality models and maps for the US. COST-Action FA 1104 Meeting – WG3 Crop Protection. Advances and prospects on monitoring and modelling of Drosophila suzukii in Europe. Wädenswil, Switzerland 26-27 March 2013

59. Campbell, A, O. Batuman, L. Chen, **L. Coop**, R. Gilbertson, N. McRoberts. 2012. Development and application of a degree-day model to predict thrips growth and development of tomato spotted wilt virus in California tomato fields. Phytopathology. 09/2012. Abstract online at: **<http://www.apsnet.org/meetings/Documents/2012_Meeting_Abstracts/aps12abP527.htm>** *Role: developed model for western flower thrips*

58. **Coop, L.**, P. Jepson. 2012. Automated mesoscale pest risk forecast maps for agricultural production and potential plant biosecurity threats. – Presentation at Midwest Weather Working Group Meeting: Setting Uniform standards for design of pest-warning systems, Aug. 3, 2012, Providence, RI. **Invited.**

57. **Coop, L.** P. Jepson, C. Thomas. 2012. Online Phenology and Infection Risk Modeling System – 2012 Update. Poster. International IPM Symposium, Mar. 28, 2012, Memphis. http://www.ipmcenters.org/ipmsymposium12/092_Coop.pdf

56. **Coop, L.**, V.M Walton, A.J. Dreves, D.T. Dalton, P.C. Jepson. 2012. A model estimating spotted wing Drosophila overwintering mortality.71st Annual PNW Insect Management Conf. Portland, OR 01/10/12.

55. **Coop, L.** 2011. Spatialized Disease Risk Forecasting for IPM and Plant Biosecurity. Dept. Botany and Plant Pathology Seminar Series, Oct 17, 2011, Corvallis, OR.

54. Thomas, C., Coggeshall, A., R. Bostock, E. Luke, M. Hill, T. Creswell, C. Estep, D. Barber, **L. Coop**, P. Jepson, H. Beck, F. Nutter, L. Madden. 2009. NPDN Launches Epidemiology Analysis Program. Poster at: NPDN National Meeting, Miami FL, Dec. 2009. *Role: performed modeling analysis and results*

53. **Coop, L.** 2009. Oregon Report presenting: Oregon IPPC & Western Weather Workgroup Activities – Nov. 2009. WERA-102 Annual Meeting: Climatic Data and Analyses for Applications in Agriculture and Natural Resources, Monterey, CA. Nov 17, 2009.

52. **Coop, L.**, A. Fox, W. Mahaffee, D. Gent, W. Pfender, C. Daly, C. Thomas, P. Jepson. Forecast and Virtual Weather Driven Plant Disease Risk Modeling System. Poster at: APS National Annual Meeting, Portland, OR, August 2009.

51. **Coop, L.** 2009. Forecasting weather and climate for plant disease models: A western perspective. North Central Division APS Annual Meeting, Ames, IA, June 22, 2009. Symposium: Implications of Climate Change on Plant Pathogens.

50. Ambrosino, MD., **L. Coop**, P. Jepson. Enhancing Leafroller Parasitoids in Caneberries. Poster at: Sixth International IPM Symposium, Portland, OR, March 2009. *Role: helped with data analysis and parasitoid identification.*

49. **Coop, L.**, P. Jepson, G. Grove, A. Fox, C. Daly, W. Mahaffee, C. Thomas. 2008. Delivery of IPM Tools in Real Time for Decision Support – Pull. APS Pacific Division Annual Meeting, Jackson, WY, June 25, 2008. Symposium.

48. **Coop, L.**, J. K. Stone, and A. Fox. 2007. A Spatial Model for Foliar Life Expectancy in Douglas Fir Affected by Swiss Needle Cast. Poster. APS National Meeting, Jul 29-30 2007. San Diego, CA. Phytopathology 97:S24.

47. **Coop, L.**, C. Daly, A. Fox, D. Gent. G. Grove, D. Gubler, P. Jepson, W. Mahaffee, W. Pfender, G. Taylor. Taming Uncertainties in Multi-Scale Pest and Disease Model and Decision Support Tools for Plant Biosecurity. Presentation. APS National Meeting, Jul 29-30, 2007. San Diego, CA.

46. Pfender, W., W. Mahaffee, **L. Coop**, A. Fox, C. Daly, C. Thomas, W. Gubler, G. Grove, D. Gent, J. Strand, G. Taylor, P. Jepson, R. Graw. 2007. Western Weather Systems Workgroup: A collaborative effort to improve weather information for IPM. APS National Meeting, Jul 29-30 2007. San Diego, CA. Phytopathology 97:S92 *Role: provided models, slides, and modeling expertise*

45. Pfender, W., J. Eynard, **L. Coop**. 2007. Sensitivity of a rust simulation model to inputs of temperature obtained at standard weather observation height vs canopy height. APS National Meeting, Jul 29-30 2007. San Diego, CA. Phytopathology 97:S92 *Role: developed virtual weather data, modeling platform*

44. Stone, J. K. and **L. B. Coop**. 2006. Predicting the effects of climate change on Swiss needle cast. Western International Forest Disease Work Conference. Oct 2-6, 2006. Smithers, BC. *Role: developed swiss needle cast model*

43. Stone, J. K. and **L. B. Coop**. 2006. Predicting effects of climate change on Swiss needle cast disease in the Pacific Northwest. APS/CPS/MSA joint meeting, Jul 29-Aug 2, 2006, Quebec-City, QC. *Role: developed swiss needle cast model*

42. Stone, J. K., **L. B. Coop**, and D. K. Manter. 2006. A spatial model for predicting effects of climate change on Swiss needle cast disease severity in the Pacific Northwest. July 18-22, 2006. Ft. Collins CO. USDA-Forest Service: Advances in Threat Assessment and its Implications for Forest and Rangeland Management. *Role: developed model, provided slides*

41. **Coop, L. B.** 2006. Online IPM Weather Data and Degree-Days – 2006 Update. L. Coop. Poster. Apr. 6, 2006. St. Louis, MO. 5th International IPM Symposium.

40. **Coop, L**. and P. Jepson. 2006. Oregon State University IPPC Online Programs: IPM Decision Support Tools. Presentation. Apr. 6, 2006. St. Louis, MO. 5th International IPM Symposium.

39. Blodgett, S. W. Lanier, **L. Coop** and C. Ford. 2006. Montana's Integrated Pest Management Program: Developing a Museum IPM Program and a Regional Cutworm Forecast. Presentation. Apr. 5, 2006. St. Louis, MO. 5th International IPM Symposium. *Role: developed cutworm forecast models and delivery system*

38. Coop, L. 2006. Use of GIS and Weather data for online crop and pest management models. Jan 9, 2006. Corvallis, OR. OSU CSS Dept. Seminar. **Invited.**

37. **Coop, L**. 2005. Interpolation & Pest Modeling: Codling Moth Degree-Day Model. Presentation. Nov. 10, 2005. Corvallis, OR. ipmPIPE Meeting – Western Weather Systems Workgroup & CSREES.

36. **Coop, L.**, P. Jepson, A. Fox, D. Upper. 2005. Weather networks and internet-based management tools for orchard IPM. Presentation, 3rd Asia-Pacific Congress of Entomology. Oct. 2005. Jeju, S. Korea. **Invited.**

35. Song, Y., H. Riedl, **L. Coop**, M. Omeg, S. Castagnoli, and L. E. Long. 2004. Development and validation of phenology models for predicting cherry fruit fly oviposition in the Mid-Columbia area. Poster, 44th Annual Pest Management Conf., Jan 2004, Portland Oregon. *Role: incorporated research results into new model*

34. **Coop, L.**, W. Bajwa, P. Jepson. Apr. 2003. Online IPM Decision Tools In the Northwest. Indianapolis Indiana. 4th National IPM Symposium/Workshop. Poster Abstract.

33. Coop, L. P. Jepson. 2003. Online Site-Specific Degree-Day Predictions Using GIS and Climate Map Technologies". Indianapolis Indiana. 4th National IPM Symposium/Workshop. Poster Abstract.

32. Apr. 2003. Indianapolis Indiana. 4th National IPM Symposium/Workshop. Poster Abstract, "Regionalization of Cutworm Forecasts and Risk Warnings". Will Lanier, Sue Blodgett, Gregory D. Johnson, and Leonard Coop. *Role: performed cutworm modeling*

31. Apr. 2003. Indianapolis Indiana. 4th National IPM Symposium/Workshop. Poster Abstract, "A Multi-Region Internet-based Extension Pest Alert System". Waheed Bajwa, Leonard Coop, and Paul Jepson.

30. Mar. 2003. Wageningen, The Netherlands. Poster Presentation, "A Phenological modeling and mapping system for NW USA: monitoring networks, pest models, online GIS, and site-specific predictions using open source technologies" at European Phenological Conference: Towards an operational system for monitoring, modeling, and forecasting of phenological changes and their socio-economic impacts. 31 March - 2 April.

29. Jan. 2003. Bozeman, Montana. "Applied Phenology Models. Combining weather networks, degree-days, GIS and the web for IPM decision support". Seminar at Dept. Entomology, Montana State University. **Invited.**

28. Feb. 2002. Corvallis, Oregon. "Open Source Software and IPM Decision Tools". OSU Entomology Dept. Seminar.

27. Feb. 2002. Boise, Idaho. L. Coop. "Demonstration of PMC Portal, Pest Alerts, and Web-GIS Pest Management Decision Tools". 45 minute presentation. IPPC/USDA CSREES Western Region Pest Management Center/PNW Pest Management Coalition Meeting.

26. Oct. 2001. Corvallis, Oregon. L. Coop. "Pest Management Decision Tools: Examples of web-based phenology models, GIS, and databases for IPM decision support". 45 minute presentation. IPPC/USDA CSREES Western Region Pest Management Center/PNW Pest Management Coalition Agroecological Regions Workshop: The Application of Watershed, Basin, and Ecoregion Analytical Tools to Pest Management.

25. July 2001. Queensland, Australia. L. Coop. "A Web-Based Server System for Phenology Modeling. Combining weather networks, development and risk models, GIS and the internet for Agricultural & IPM decision". Seminar and workshop conducted at Queensland Gov. Natural Resources and Mines, Brisbane, Queensland Australia. **Invited.**

June-July 2001. Victoria, Australia. L. Coop. "A Web-Based Server System for Phenology Modeling. Combining weather networks, development and risk models, GIS and the internet for Agricultural & IPM decision support". Seminars and workshops conducted at four separate Agric. Research institutes:

24. Knoxfield, Victoria, Australia. **Invited**

23. Rutherglen, Victoria, Australia. **Invited**

22. Tatura, Victoria, Australia. **Invited**

21. Horsham, Victoria, Australia. **Invited**

20. Jan. 2001. Bozeman, Montana. L. Coop. "Applied Phenology Models. Combining weather networks, degree-days, GIS and the web for IPM decision support". Seminar and workshop conducted at Dept. Entomology, Montana State University. **Invited.**

19. Aug. 2000. Iguassu Falls, Brazil. L. Coop, W. Bajwa, M. Kogan. "Online Application Server for Phenology Models and Maps". Poster presented at the XXIII International Congress of Entomology.

18. Dec. 1999. Atlanta, GA. L. Coop, W. Bajwa, and M. Kogan. "On-line phenology modeling and mapping using weather station networks, climate maps and GIS". Entomological Society of America, National Meetings.

17. Nov. 1999. Yakima, WA. Areawide Codling Moth Research Reports. Presentation entitled "Update on Online weather data and phenology models for areawide codling moth management".

16. April. 1999. Corvallis, Oregon. "Online IPM Decision Support". IPM in Oregon Conference 1999: Achievements and Future Directions.

15. Feb. 1999. Corvallis, Oregon. "Introduction to online Phenology Models". OSU Entomology Dept. Seminar.

14. Oct. 1998. Corvallis, Oregon. Areawide Codling Moth Research Reports. Presentation entitled "Online weather data and phenology models for areawide codling moth management".

13. Nov. 8, 1995. Raleigh, NC. Represented Oregon State University at the second meeting of the National IPM Network.

12. April 7-9, 1994. Dakar, Senegal. Presented a paper entitled 'Developing Economic Injury Levels for Grasshopper Pests of Millet' at the Sahel IPM Conference.

11. July 14, 1993. Medford, Oregon. International Pear Research Conference. Presented a paper entitled 'Geographic information systems and simulation in regional orchard management: pesticide resistance in Hood River Valley, Oregon'.

10. June 29, 1993. Portland, Oregon. Entomological Society of America (ESA) regional meetings. Presented a paper entitled 'Pear psylla resistance patterns and geographic information systems'.

9. Dec. 5-10, 1992. Baltimore, MD. ESA national meetings. Presented a paper entitled 'Grasshopper damage to pearl millet in Mali, West Africa'.

8. Dec. 6-10, 1991. Reno, Nevada. ESA national meetings. Presented a poster display entitled, 'Crop Loss Assessment and Decision Tools for Grasshoppers in Sub-Saharan Africa'.

7. July 8-12, 1991, Corpus Christi, Texas. International Sorghum/Millet INTSORMIL CRSP conference. Presented two poster displays: 1. Crop loss assessment in millet. 2. Millet pest damage recognition.

March 16-28, 1991. Ouagadougou, Burkina Faso, West Africa. Participated in USAID sponsored colloquy, 'Millet crop loss assessment: A colloquy on the current state of knowledge'; Including:

6. 45 minute talk entitled 'The adjusted-length crop loss assessment method, with emphasis on USAID-funded research done in Gambia, Senegal, Mali and Chad, 1980-90'. **Invited**

5. 45 minute talk entitled 'Crop loss assessment research on millet near Mourdiah, Mali'. **Invited**

4. 25 minute talk entitled 'Analysis of grasshopper control in the Sahel: GHLSIM model'. **Invited**

3. Poster display entitled 'Damage recognition and assessment for pests of millet'. **Invited**

2. May 1990, Corvallis, Oregon. Departmental seminar entitled 'Analysis of grasshopper control in the Sahel'. OSU Department of Entomology.

1. Jan. 1990. Honolulu, Hawaii. Participated in a workshop entitled 'Modeling pest-crop interactions' organized by USAID-sponsored International Benchmark Sites Network for Agrotechnology Transfer. Presented paper GHLSIM: Sahelian grasshopper/crop loss simulation.

3. Grant and contract support

a. Grant support (current total: $1.6M; total since 2002: $7.6M)

Year(s)	PI(s)	Agency	Title	Total $	$ my program
Jul 2023 – Jun 2028	Barker, B. (PI), Grevstad, F., Coop, L., Bean, D. (Co-PIs)	DoD SERDP	Managing yellow starthistle using a new biocontrol agent: an integrative experimental and geo-climatic modeling approach	$1,556,466	$28,000
Apr. 2022-Mar 2025	Coop, L. (PD), Barker, B., Crimmins, T. (Co-PDs)	USDA/ NIFA/ AFRI/TSAB	Enhancing U.S. biosecurity with improved pest forecasts and public engagement	$993,810	$603,968
Sept 2021 - Aug 2024	Coop, L. (PD), Hedstrom, C., Sandlin, I., Buhl, K., (Co-PDs)	USDA/ NIFA/ CPPM/EIP	Oregon Extension IPM: Meeting Critical Needs Through Adoption, Education, Decision Support and Pest Impact Assessment	$536,875	$161,000 (Climate and weather-based decision support)

Prior Grants – cumulative total awards to my program and grants for which I was PI: $6,585,744. Total since 2002: $5,948,960.

Sept 2020 – Aug 2022. USDA/APHIS/PPQ. Improving boxwood blight mitigation through innovative research. Hong, C. Baudoin, A. Benson, M. **Coop, L.** et al. $410,000 [Full Grant] $37,105 [Coop Portion]

May 2017-Apr 2022. DoD SERDP. Using daylength in phenology models for the biocontrol of weeds on DoD lands Grevstad, F. (PD) **Coop, L.** (Co-PD) Bean, D. $971,374 [Full Grant] $229,615 [Coop Portion].

Sept 2020 – Aug 2021. USDA APHIS PPQ. Improving boxwood blight mitigation through innovative research. Hong, C., A Baudoin, M. Benson, **L. Coop**, J. Crouch, N. Dart, et al. $340,000 [Full Grant], $37,105 [Coop Portion].

Sept 2020-Aug 2022. USDA NIFA CPPM EIP. Coop Portion Title: Climate and weather-based decision support. K Murray (former PD), P Jepson, **L Coop** (PD). $300,000 [Full Grant], $40,000 [Coop Portion].

Aug 2017-Aug 2021. USDA APHIS PPQ CAPS. Development of new mapping technologies for improved risk analysis and support of field operations. L. Coop, J. Bowers. $140,000.

Sept 2017-Aug 2020. USDA NIFA CPPM EIP. Coop Portion Title: Climate and weather-based decision support. K Murray (PD), P Jepson, L Coop (Co-PD). $900,000 [Full Grant], $120,000 [Coop Portion].

July 2017 – Dec 2018. USDA APHIS PPQ. Enhancing boxwood blight mitigation through innovation, integration, and education. Hong, C., A Baudoin, M. Benson, L. Coop, J. Crouch, N. Dart, et al. $490,000 [Full Grant], $42,639 [Coop Portion]

July 2017- Jun 2019. USDA WR-IPM Center. Enhanced Implementation of the online soil solarization forecast model. J. Parke (PD), Nackley, L, Coop, L (Co-Pds). $30,000 [Full Grant], $8,000 [Coop Portion].

May 2017-Apr 2021. Dept of Defense/SERDP. Incorporating photoperiodism in insect phenology models with application for the biological control of weeds on DoD lands. F. Grevstad (PD), D. Bean (Co-PD), L Coop (Co-PD). $971,374 [Full Grant], $229,615 [Coop Portion].

Aug 2016-Dec 2017. USDA APHIS PPQ CPHST. Development of new mapping technologies for improved risk analysis and support of field Operations. L. Coop, G. Cook. $89,000.

July 2016-Dec 2017. USDA WR-IPM Center. A model to predict duration of soil solarization for disinfesting nursery soils contaminated by Phytophthora spp. J. Parke (PD), Coop, L (Co-PD). $30,000 [Full Grant], $8,000 [Coop Portion].

July 2015- Dec 2017. USDA/APHIS (Farm Bill). Understanding environmental factors for boxwood blight development. Hong, C (PD)., A. Baudoin, M. Benson, L. Coop, J. Crouch, N. Dart, et al. $496,178 (2015-16) + $89,300 (2016-17) [Full Grants], $38,809 (2015-16) + $5,900 (2016-17) [Coop / OSU Portion].

Sept 2014- Aug 2018. USDA WR-IPM Center Signature Program. Climate and weather-based decision support tools. L. Coop (PD) and P. Jepson. $193,066.

Sept 2014- Dec 2017. USDA/NIFA/CPPM/ARDP. Medium and extended range weather and climate forecasts scaled and tested for improved IPM decision support in US States. Coop, L., (PD), G. Grove, A. Fox, D. Johnson, A. Dreves. $240,466 [Full Grant], $156,492 [Coop Portion].

Sept 2012-Aug 2017. USDA NIFA SCRI. Rear and release psyllids as biological control agents - An economical and feasible mid-term solution for Huanglongbing (HLB) disease of citrus.Tom Turpen (PD) H. Browning (co-PD) J. Brown (co-PD) ...Coop, L (Key Personnel). >$10M. OSU/Coop: $85,829.

Sept 2015-Aug 2016. USDA APHIS PPQ CPHST. Development of new mapping technologies for improved risk analysis and support of field Operations. G. Cook, L. Coop, $109,000.

Sept 2013-Aug 2014. USDA APHIS PPQ CPHST. Development of new mapping technologies for improved risk analysis and support of field Operations. G. Cook, L. Coop, $25,000.

Sept 2012-Aug 2015. USDA-SARE Global Food Security and Hunger/Crop Production. A Collaborative Phenology Modeling System to Enhance Crop Management on Vegetable Farms. Andrews, N. (PD), Coop, L. (Co-PD). $203,608. (Crop phenology/web development portion $74,932).

Aug 2014-Jun 2015. USDA APHIS PPQ. Understanding environmental factors for boxwood blight development. C. Hong, A. Baudoin, M. Benson, L. Coop et. al. $21,902 (subaward to L. Coop).

Apr 2013-Mar 2015. USDA-Forest Health BCIP. Incorporating Photoperiod in the Prediction of Biocontrol Agent Photoperiod in the Prediction of Biocontrol Agent Phenology and Voltinism. Grevstad, F. (P.I.), Coop, L. (Co-PI). Year 1 $44,765, Year 2 $46,000.

Aug 2010-Jul 2014. WSC-PIPE. Specialty Crops in the Western USA - Pest Information Platform for Extension and Education. Monitoring, diagnosis, forecasting and reduced risk management of invasive pests and diseases. USDA RMA Jepson, P (PD), Coop, L (Co-PD). $999,969. (Pest risk modeling and mapping portion $260,195)

Jan 2010-Jul. 2012. Sustainable grape pest management for California using weather data, models, and cultural controls. Calif. Dept. Food and Agri. SCBGP. Coop, L. (PD of subcontract); Gubler, W.D., Broome, J.C. $154,359.

Mar 2010 – Feb 2014. Automated mesoscale pest risk forecast maps for agricultural production and potential plant biosecurity threats. USDA AFRI Plant Biosecurity. Coop, L (PD), Gent, D, Mahaffee, W, Johnson, D., Gubler, W.D. $996,112.

July 2009 – June 2010. NPDN Diagnostic Data Anomalies: Geographic Visualization and Mining System USDA NPDN (Nat. Plant Diag. Network). L. Coop, P. Jepson. $53,400.

Sept 2009 – Aug 2011. IPM Disease Risk Forecasts and Virtual Weather for Western States. USDA WRIPM Specialty Grants. Coop, L.B., Jepson, P., Gent, D., Grove, G. $179,221.

April 2009 – Mar 2011. Adapting and improving swiss needle cast management tools to incorporate climate change. USDA Forest Service PNW Region – FHP Technology Development Program. Stone, J., Coop, L. $121,581.

Jan 2008 - Dec 2009. Accessing IFPnet weather data through the OSU Integrated Plant Protection Center pest and disease modeling system. Columbia Gorge Fruit Growers/ARF. L. Coop, S. Castagnoli, L. Long. $12,000.

July 2008 – June 2009. NPDN Diagnostic Data Anomalies: Geographic Visualization and Mining System USDA NPDN (Nat. Plant Diag. Network). L. Coop, P. Jepson. $82,583.

Apr 2009 – Mar 2011. Implementing conservation biological control for caneberries. USDA PMAP. P. Jepson, L. Coop, J. Lambrinos. $270,835.

Jun 2007 – May 2008. NPDN Diagnostic Data Anomalies: Geographic Visualization and Mining System USDA NPDN (Nat. Plant Diag. Network). L. Coop, P. Jepson. $80,000.

Jan-Nov 2007. A Spatial model for predicting swiss needle cast distribution and severity. Swiss Needle Cast Cooperative. J. Stone, L. Coop. $48,532.

Jul 2006 – Jun 2007. NPDN Diagnostic Data Anomalies: Geographic Visualization and Mining System USDA NPDN (Nat. Plant Diag. Network). L. Coop, P. Jepson. $81,000.

Jan 2006-Jan 2009. Taming uncertainties in multi-scale pest and disease model and decision support tools for plant biosecurity. USDA NRI – Plant Biosecurity. L. Coop, P. Jepson, C. Daly, W. Mahaffee, G. Taylor. $645,000.

Jul 2005 – Jun 2006. NPDN Diagnostic Data Anomalies: Geographic Visualization and Mining System USDA NPDN (Nat. Plant Diag. Network). P. Jepson, L. Coop, H. Luh. $110,000.

Jun 2005 – May 2006. Assessing the contribution of biocontrol for leafrollers in caneberries ORBC (OR Raspberry and blackberry Commission/ARF): L. Coop, M. Ambrosino. $9,879.

Mar 2005 – Dec 2005. Determining the potential of biocontrol for leafrollers in caneberries. USDA WR-IPM. L Coop, P. Jepson. $59,979

Sep 2005 – Aug 2008. Enabling transition to biocontrol of leafrollers in caneberries. USDA CAR (Crops at Risk). P. Jepson, L. Coop. $477,427.

Sep 2005 – Aug 2006. Swiss Needlecast GIS modeling framework. Swiss Needle Cast Cooperative. J. Stone, L. Coop, D. Manter. $25,000.

Jul 2004 – Jun 2005. NPDN Diagnostic Data Anomalies: Geographic Visualization and Mining System USDA NPDN (Nat. Plant Diag. Network). P. Jepson, L. Coop, H. Luh. $105,000

Jun 2005. New server for pest modeling, GIS, and webserving. NPDN/WRPMC. L. Coop, P. Jepson. $5,000.

Feb 2004 - May 2004. Development of a Database of Host and Pest Taxonomies for NPDN (National Plant Diagnostic Network). L. Coop, D. Upper, P. Jepson. Subcontract with USDA/APHIS/NAPIS/NPDN/Purdue Univ. $10,000.

July 2004 - June 2006. Stem Rust Prediction and Decision Aid for Disease Management. C. Lipp, L. Coop, W. Pfender. CSREES GSCSSA. $84,908.

Aug 2003 - July 2005. Regional Internet and GIS-Based Multiple pest Forecasting and Risk Management System. L. Coop, and R. Spotts, Project Directors. USDA WR-IPM Grants Program. $98,000.

Aug 2003 - July 2005. Electronic Delivery of IPM and Decision Support Tools for Field Use. R. William, M. Engels. USDA WR-IPM Grants Program. $29,000.

--(17 grants, $636,784 total to date)--

Jan - July 2003. Cutworm Risk Mapping GIS. Sub-contract to Montana State University. Provide automated data processing and mapping of cutworm risk monitoring data for 7-state western region. $5,000.

Sept 2001 - Aug 2003. IPM Web Portal System. Western Regional Pest Management Centers USDA Grants Program. Oregon Proposal FY 2002-2003 $26,000 (Objective 2. Establish a state/multi-state/territory based pest management information and communication network linking USDA and other Federal agencies with agricultural researchers and stakeholders throughout the region.) (Lead authors Jeffrey Jenkins, Paul Jepson and Marcos Kogan).

July 1999 - July 2002. Information Exchange Driven IPM: Applied Research and Decision Support. L. Coop, M. Kogan, W. Bajwa. WR-IPM USDA Grants Program. $100,000.

July 1999 - June 2001. Web-based Decision Support System for Integrated Pest Management. Online version of PNW Pest Control Handbooks. L. Coop, Principal Investigator. OSU Extension Service Innovative Projects. $10,000.

July 1999 - Jan 2002. Online Decision Support System for Integrated Pest Management on Peppermint - IPMP version 3.0. R. Berry, L. Coop. Mint Industry Research Council & Oregon Mint Commission. $19,648.

Jan 1999 - Sept 1999. Areawide management of Codling Moth. USDA areawide control project. (Co-author with M. Kogan and W. Bajwa). $20,000.

July 1998 - June 1999. Oregon Processed Vegetable Commission. Regional pest monitoring program. $9,800.

Mar 1998 - Feb 1999. Areawide Management of Codling Moth. L. Coop, M. Kogan, W. Bajwa. USDA Areawide Control Project. $15,000

Mar 1997 - Feb 1998. Areawide Management of Codling Moth. L. Coop, M. Kogan. USDA Areawide Control Project. $27,416

Jun 1996 - Jun 1998. Phenology Mapping of Tree Fruit Pests. L. Coop, M. Kogan. Western Regional IPM USDA Grants Program. $60,000.

Jun 1995 - July 1996. Phenology Mapping of Tree Fruit Pests. L. Coop, M. Kogan, B. A. Croft. Western Regional IPM USDA Grants Program. $15,910.

March 1995. Biological Control of Spider Mites with Neoseiulus fallacis. L. Coop, B. A. Croft. Strawberry Commission/CAAR. $12,000.

Feb 1995 - Jan 1996. Dispersal of Neosieulus fallacis, a Bbiological Control Agent of Spider Mites in Strawberry and Raspberry. L. Coop, B. A. Croft. Northwest Center for Small Fruits Research (USDA). $12,000.

May 1991 - Apr 1992. Decision tools for grasshopper control in the Sahel. $101,000. L. Coop, B. A. Croft. USAID/Africa Bureau. Matched by additional field research support of $25,000 by USAID/Mali.

Jan 1990 - Apr 1991. Economic analysis of grasshopper and locust control in the Sahel of Africa. L. Coop, B. A. Croft. $61,000. USAID/Africa Bureau. Matched by additional field research support of $50,000 by USDA/OICD and USAID/Mali.

June 1987 - May 1989. Management of corn earworm in processed sweet corn. L. Coop, R. Drapek, B. A. Croft. Oregon State University Agricultural Experiment Station. $30,000.

Jan 1987 - Dec 1991. Control of corn earworm in processed sweet corn. L. Coop, R. Drapek, B. A. Croft. Oregon Processed Vegetable Commission. $47,000.

4. Patent awards, cultivar releases, and inventions – N/A

D. SERVICE

1. University Service

a. Oregon IPM Center (IPPC until 2020)

Serve as Associate Director for Decision Support Systems and participate and assist in meetings, committees, decision making, CAS Unit Head meetings, etc.

Serve as Chair of search committee for two new positions at OIPMC, IPM Educator. Apr. 2023.

Serve as PI for the USDA Extension IPM Program since Jan 2021. I have served as IPPC/Oregon IPM Coordinator Representative at several WERA-1017 Western Region IPM Coordinator meetings.

Served as lead P.I. for the NIFA/WR-IPM Center funded Signature Program (2013-2018).

Served as a member of the hiring committee for the new Director of OIPMC (2021)

b. Entomology, BPP and Horticulture Depts.

I have served in the usual ways by serving on committees, especially as a graduate college representative, giving and participating in seminars and trainings, and providing guest lectures at courses led by others in the unit.

2. Service to the Profession

a) Peer-Review of Journal Articles

2014, 2015, 2016, 2019, 2020, 2022, 2023 – Review articles for the Journals: 1) Plant Disease, 2) Phytopathology (x2), 3) Invasion Biology, 4) OSU EESC (x2), and 5) J. of Econ. Entomol., 6) J. Insect Science, and 7) Front. Insect Sci.

2019, 2023 – Anonymous review of Extension Publications for Horticulture Dept. for OSU Extension Bulletins.

b) Service on Grant and Awards Review Panels:

2020 – USDA NIFA Western Sustainable Agriculture Research and Education (SARE) Program

2016 – Undergraduate Entomology Scholarship Award

2013 – USDA NIFA Pest Management Alternatives Program (PMAP)

3. Service to the Public (Professionally Related)

1983-2010. Coop, L. Guest Speaker on insects; kindergarten, third and fourth grade elementary classes, Briarwood Elementary school, 1983, 1984, 1989, 1992, 1999, 2009, 2010.

1996-2001. Volunteer Assistant, OSU Entomology Museum Days (public showcase of insects from around the world) 1996, 2001.

E. AWARDS

1. National and International Awards and Memberships

2013-2018 Western IPM Centers Signature Program

2012 IPM International Achievement Award, IPM Symposium Mar. 28, 2012, Memphis TN. Awarded to members of the Integrated Plant Protection Center.

2007-2015. Member American Phytopathological Society

1983-2001,2007-present. Member of Entomological Society of America.

2005-present. Member Western & Midwest Weather Systems Workgroups

2004-2014. Member National Plant Diagnostics Network

1997-2003. Member local and campus Linux computer user groups.

1998. Infoworld Top 100 Innovative Technology Achievements Award.

1995-2006. National IPM Network representative and member of Standards Committee.

1992-1995. Member Organization for Sustainable Agriculture.

1988-1992. Member of Southwestern Entomological Society.

2. University Awards and Memberships

2023. E. R. Jackman Team Award. Awarded to Oregon IPM Center. June 6, 2023. OSU College of Agricultural Sciences.

2019. OSU Extension Association Search for Excellence Award. Project Happy Apples. A.J. Detweiler, T. Stephan, L. Coop. OSUEA.

1986. OSU Entomology graduate student travel award.

1980-81, 1984-85. Departmental representative in Graduate and Professional Student Association.

1977. Freshman chemistry award (top student in general chemistry). Baker University.

1975-79. Kansas State Scholar award and scholarship.

1975-79. Baker University Honors scholarship.

F. DIVERSITY, EQUITY and INCLUSION

I am committed to, and have always striven to be fair, inclusive, and equally supportive of all persons, regardless of their background education, ethnicity, gender, age, or other factors. I realized the need to adopt this approach at my first jobs as a dishwasher and cook in high school, where I quickly learned how to work with a diverse group of co-workers from a wide variety of backgrounds. While working in West Africa, our project that ran for two years was essentially supervised by a Malian woman who lined up much of our local staff of 7-10 workers, including two female scientists (M.S.) from Mali, and one male scientist (PhD) from Senegal. We had a great team that proved to me how diversity can strengthen both process and outcomes. At OIPMC and USPEST.ORG, our online programs are intended to freely serve all stakeholders, including those in underserved regions and in underserved cropping systems. The hiring I have participated in was conducted wholly in accordance with OSU DEI standards, and has resulted in a wide diversity of people hired over the years.