

Oregon IPM Newsletter

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Biologically-based IPM in Oregon

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Background



Ecoregions of Oregon, with agricultural land use superimposed in green

Twenty-eight percent of the Oregon land area (17.5 million acres) is under agricultural use, yielding farm gate receipts in excess of 3 billion dollars per annum. Nineteen percent of this area is harvested cropland growing over 125 agricultural commodities.

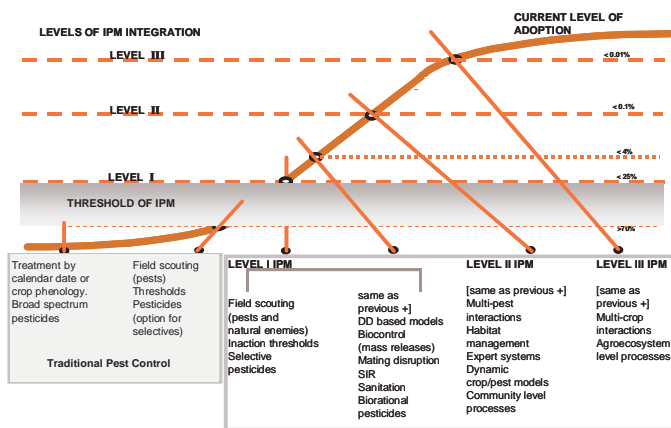
Pest management approaches, prior to the introduction of modern synthetic pesticides, included biological control, with numerous introductions of arthropod agents occurring during the first half of the last century, against a large number of target pests (Ritcher, P.O. (1966) OSU Ag. Exp. Stn. Tech. Bull. 90). The rate of introduction declined substantially in the second half of the 20th century.

There have been some notable biological control successes in Oregon. For example, filbert aphid (*Myzocalis coryli*) biological control saves hazlenut growers at least \$10,000,000 each year, and tansy ragwort (*Senecio jacobaea*) biological control saves at least \$5,000,000 annually.

A number of biological control programs now exist at OSU, the Oregon Department of Agriculture (ODA) and in USDA ARS laboratories. The Oregon statewide IPM program is seeking to facilitate communications and interactions between these programs.

Without renewed emphasis on biologically-based IPM in Oregon, we will not progress further along on the IPM continuum within the state.

CONCEPTUAL REPRESENTATION OF IPM AT THREE BASIC LEVELS OF INTEGRATION



IPM is conceptualized at three levels of integration: I. Integration of control methods for single pests; II. Integration of multiple pest impacts (weeds, insects, pathogens); III. Integration of multiple pests and control methods within whole cropping systems. Percentages of adoption on the right are gross estimates based on the literature (concept and graphic by Marcos Kogan, OSU IPPC).

Record of Introduction and Establishment

There are significant differences in the scale and success of arthropod and weed classical biological control programs in Oregon (arthropod data 1964-1989, Western Region Project W-84; weed data from Oregon Department of Agriculture database, 1970's-present day). The success of the weed control program can be attributed to a highly effective partnership between ODA and OSU.

State	Pest species	Number of natural enemy introductions	Natural enemies established
Arizona	7	16	3
California	35	140	44
Colorado	1	3	2
Idaho	3	17	2
Kansas	2	3	0
Montana	1	6	0
New Mexico	7	8	6
Oregon	8	17	1
Utah	8	23	2
Washington	7	29	2
Wyoming	2	4	0
Totals	81	267	63

Summary of the introduction and establishment of natural enemies for biological control of arthropod pests. Data from Western Regional Project W-84, 1964-1989. Western States, excluding Nevada.

State	N. Plant Species	N. Introduced Agents	N. Agents Widespread	N. Classified As Exerting Good or (Excellent) Control
Arizona	5	10	0	0
California	27	66	27	3 (24)
Colorado	16	50	19	7 (28)
Idaho	20	59	23	21 (20)
Montana	12	62	8	24 (15)
Nevada	9	26	2	3 (15)
New Mexico	5	11	3	2 (6)
Oregon	28	98	39	42 (20)
Utah	11	39	4	18 (16)
Washington	24	65	28	35 (15)
Wyoming	18	58	10	14 (29)

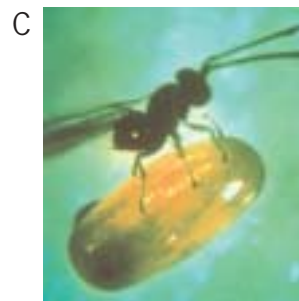
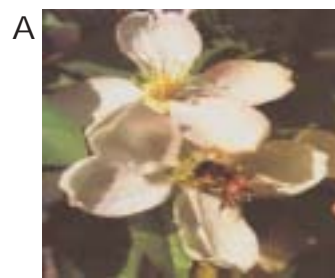
Summary statistics for weed biological control programs in 12 Western States (from Oregon State of Environment Report (2000). Data analysis by Eric Coombs, ODA.

Renewed Emphasis on Biologically-Based Pest Management

Recent developments:

A Biologically-based pest management workshop was jointly organized by OSU, USDA ARS and ODA, on December 13th 2003.

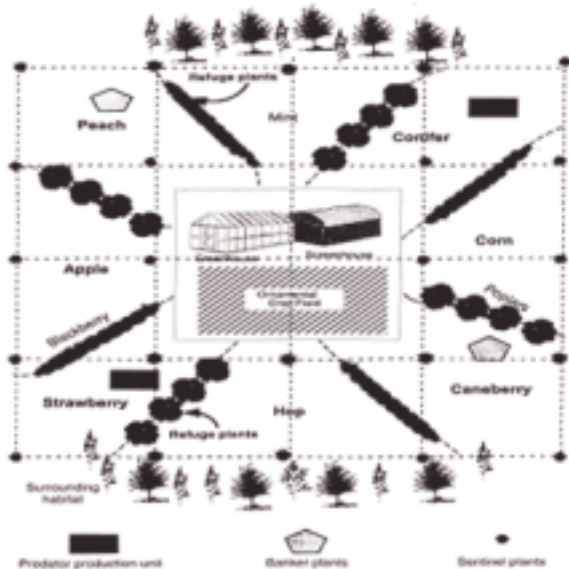
The workshop program and a summary of discussions and conclusions can be found in the **Oregon IPM Newsletter** (January 2003 edition) at <http://oregonipm.ipcm.orst.edu>.



Examples:

- A) Fire Blight biocontrol with BlightBan A506 (Johnson, Stockwell, OSU; Loper, USDA),
- B) *Botrytis* biocontrol (Mahafee, USDA),
- C) Cereal Leaf Beetle biocontrol with *Anaphes flavipes* (Bai, ODA),
- D) Purple Loosestrife biocontrol with *Galerucella californiensis* (McEvoy, OSU; Coombs, ODA).

Pathways to Progress

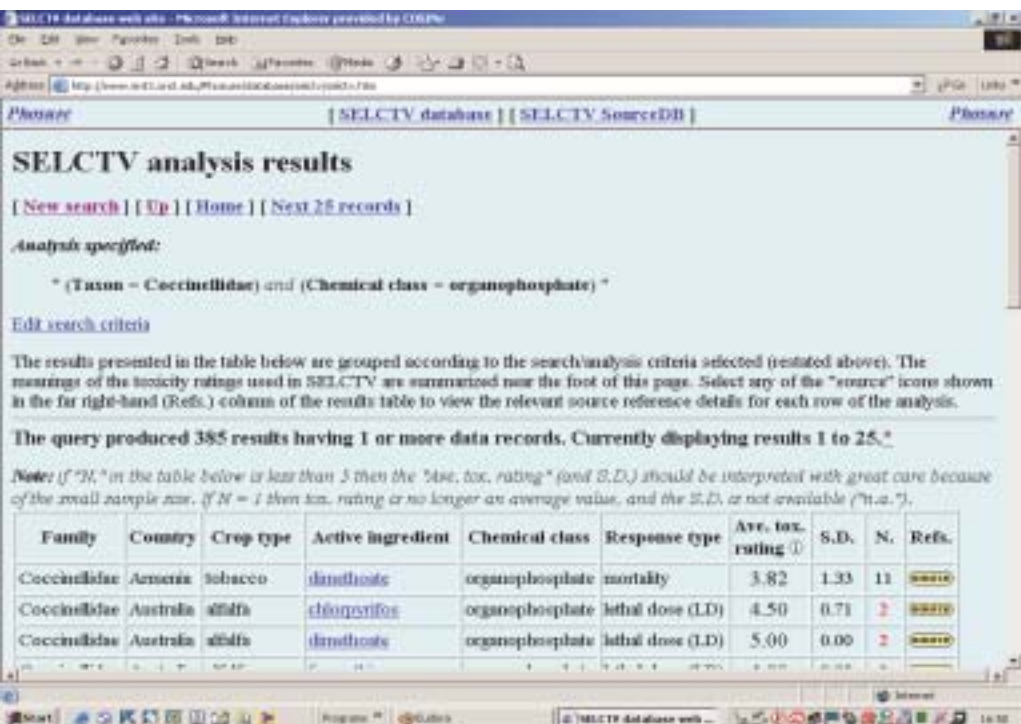


Generalized regional site for integrated control of spider mites and predator mites (includes ornamental operations complex for production of plants and predator mites). Concept by Brian Croft, OSU.

Further workshops and conferences are being planned, and the recent BBI PM workshop identified acquisition of a graduate training grant as a key facilitator of collaboration between disciplines and agencies.

A conference on Biologically-Based IPM in the Pacific Northwest is being planned as an activity of the Western Region IPM Center. Please let us know if you wish to be informed of progress in planning.

The lead contributors to this effort include: Peter McEvoy, Sujaya Rao, John Luna (OSU), Eric Coombs, Barry Bai, Kathleen Johnson (ODA), Joyce Loper, Walt Mahafee (USDA ARS), and the more than 40 others that attended and participated in the BBI PM workshop



Existing concepts and tools must be advanced to implementation through on-farm research and outreach programs (e.g. multi-habitat predatory mite management system, developed by Brian Croft at OSU, and SELECTV database of pesticide effects on natural enemies, developed by Croft, Heneghan and Jepson. <http://www.ent3.orst.edu/Phosure/database/selctv/selctv.htm>

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