

Organic Tree Fruit Research Needs for Washington State

Meetings were held in Wenatchee and Wapato during November and December 2002 with researchers and organic orchardists to determine priorities for organic tree fruit research in the state. The meetings were convened by Washington State University, Washington Tree Fruit Research Commission, and USDA-ARS. An initial list of needs was developed and mailed to all organic orchardists in the state, requesting their input on prioritization of the needs. Only about 20 responses were received. The narrative below reflects input from both the meetings and the survey responses. Table 1 summarizes the survey responses, where rankings of 1 (low) to 5 (hi) were used, and the rank number was multiplied by the number of respondents to create a score for the need (only using rank 4 and 5).

FINDINGS

Organic tree fruit producers have research needs that may be unique to their production system as well as needs that apply to all growers in the state.

General. Growers would like more systems studies for organic orchards that would help reduce the need for external inputs and maximize the ability to produce fruit quality in line with consumer desires. Deciding what organic standard (e.g. U.S. vs. Europe) to use as the basis for research is an unresolved question. Growers supported the idea of an extension person who would help pull together and synthesize information for organic growers and generate new information through surveys and other means.

Horticulture. Crop load management (blossom thinning), weed control, and soil management are the three priority areas of need for horticulture. Current work on thinning is providing viable options, but alternatives to sulfur and post-bloom options are needed. Weed control methods that reduce cost and impact on the soil are needed, such as the current mulching and cover crop work, and evaluation of new weed control materials (e.g. acetic acid) is a high priority. More work is needed to develop reliable guides for using various organic fertilizers in orchards, especially for obtaining good growth of young trees and for maximizing the value from the relatively expensive organic nutrient sources. Vertebrate pest control, especially for rodents, is a weak link to exploiting novel orchard floor management strategies. Other horticultural issues include water management, breeding trees for organic systems, Gala stem end splitting, and the effect of organic practices on fruit quality.

Entomology. Codling moth remains a key pest for apples and pears. Current tools such as pheromones need to be retained, new tools such as virus need to be developed, and studies of the integration of the various controls are needed to optimize the system. Cherry fruit fly requires new control techniques, and research and education will be needed to properly use the new spinosad formulation for organic growers to avoid resistance problems. There are no good controls for true bugs. Non-sulfur controls for pear rust mite are needed. Other pests of concern include thrips, black cherry aphid, and pear slug. Growers would like increased research on conserving and enhancing beneficial insects in orchards that can exert meaningful biological control. Research is needed on new products, including those reformulated for organic production, to guarantee efficacy.

Pathology. Alternative controls to sulfur and copper are needed. Breeding is the best approach for controlling scab, mildew, fireblight, and bacterial canker. Growers need alternatives to fumigation for replant disease, and research is on-going. Research on new products and techniques, such as compost tea and systemic acquired resistance, would be useful.

Post-harvest. Key issues include alternatives to chlorine, control of storage disorders (scald, cherry decay), new treatments for export phytosanitary requirements, potential benefits from plant growth regulators (e.g. ReTain), and DPA contamination. More needs to be known about how organic fruit quality is affected by storage and whether pre-harvest practices in organic orchards can help manage storage diseases. There may be a need for new packaging options for organic fruit.

Table 1. Organic tree fruit research priorities based on rankings by growers.

Research Need	Weighted ranking values		
	5	4	Totals
General			
1.Systems Studies	40	4	44
2.Organic Extension Agent	15	8	23
3.Survey of organic practices	0	24	24
Hort - Soils			
1.Fertility mgt in organic soils	25	24	49
2.Soil Quality	5	16	21
3.Evaluate fertility products	0	8	8
4.Site-specific nutrient mgt	5	16	21
5.N on young trees	0	8	8
6.Soil effects on fruit quality	25	12	37
7.How to measure Soil biology	20	16	36
Hort - Weeds			
1.Alternatives to Tillage	30	24	54
2.Use of ground covers and mulches	30	24	54
3.New products (e.g. vinegar)	35	32	67
Hort - Crop Load Mgt			
1.Timing, rates on chem. thinners	10	16	26
2.Need non-sulfur thinners	15	24	39
3.Post-bloom thinning options	30	12	42
4.Integrate bloom mgt with N mgt to reduce biennial bearing	20	28	48
Hort - other			
1.Water mgt. Link with fruit quality	0	36	36
2.Influence of org practices on fruit quality	25	16	41
3.Breeding-sp. for organic conditions	10	8	18
4.Vertebate pest control	35	16	51
5.Reducing Gala stem end splitting	20	16	36

Research Need	Weighted ranking values		
	5	4	Totals
Entomology			
1. Codling moth – new controls	60	16	76
2. Areawide management in organic	0	0	0
3. Integrate all possible controls	25	20	45
4. More policing of unsprayed trees	10	8	18
5. Cherry fruit fly controls	30	20	50
6. Controls for true bugs (lygus, stink, campy)	5	12	17
7. Spinosad use	5	20	25
8. Thrips: control tools on apple and cherry	5	8	13
9. Black cherry aphid: Need control options	5	8	13
10. Pear rust mite – need controls other than S	5	12	17
11. Evaluate products reformulated for organic	15	32	47
12. Enhancing beneficial insects	20	40	60
Pathology			
1. Replant disease – controls, genetics	25	20	45
2. Mildew – breed resistant varieties	15	12	27
3. Fire blight – breed resistant varieties	0	8	8
4. Bacterial canker	5	12	17
5. Alternatives to sulfur as a fungicide	15	16	31
6. Alternatives to copper as a fungicide	10	20	30
7. Efficacy of novel controls	15	20	35
8. How to utilize Systemic Acquired Resistance	5	28	33
Post Harvest			
1. Chlorine – alternatives	20	16	36
2. Storage disorders–scald (predicting, use of ozone)	5	52	57
3. Phytosanitary options for export–temperature, RF	25	16	41
4. Organic options for pre-harvest ctrl storage dis.	40	36	76
5. Cherry decay with longer storage	5	16	21
6. Fruit quality differences with organic fruit	15	16	31
7. Packing containers suitable for organic	0	20	20
8. DPA residues on organic fruit	5	0	5
9. Increase luster on Red Delicious	5	16	21
10. Use of plant growth regulators – e.g. ReTain	5	20	25

Rankings based on responses from 21 growers.

-- submitted by David Granatstein, WSU CSANR, Wenatchee, WA 09/08/2003