

Considerations for Transitioning Perennial Production to Organic

David Granatstein

*Washington St. Univ. Extension
Wenatchee, WA*



Organic pears near Chelan, WA

Understanding Organic Agriculture Webinar
Oregon Tilth & USDA-NRCS – Apr. 4, 2017



Outline

3 transitions

Business analysis

Production aspects

Questions ?



Scope of Presentation

- Applies broadly to woody perennials – trees, vines, berries
- Not restricted to one region or crop; but based on tree fruit systems in irrigated PNW
- Scale – more than a few fruit trees or berry bushes; blocks of crop; e.g. 1 ac to 100 ac

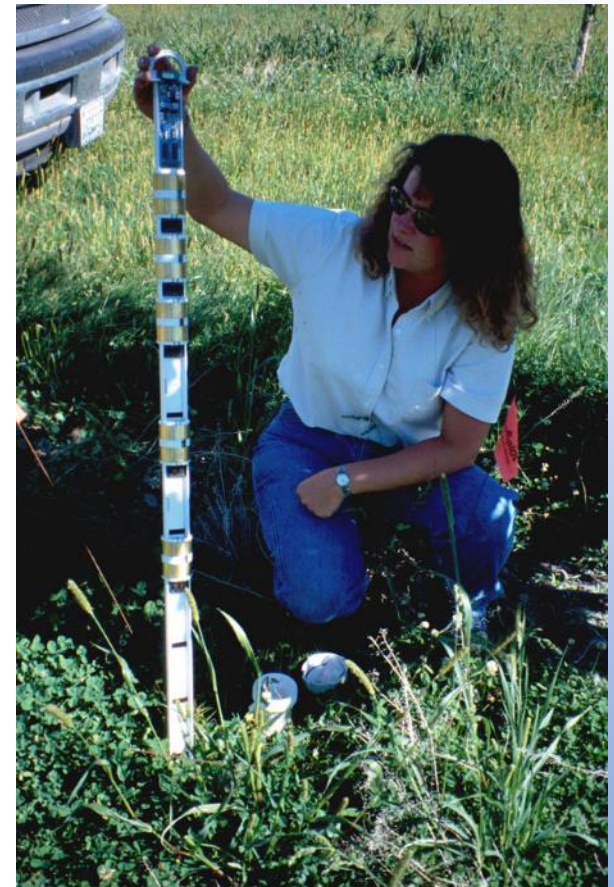
Organic Certification

- 3-year transition
- Choose certifier
- Certification process
 - forms, fees, inspection

Transition registration not required

Benefits:

- Advice from certifier
- Practice the process
- Potential markets



Transition to Organic Farming

Mental Transition:

- Tolerate more risk, more damage
- Focus on prevention, timeliness of management; fewer 'rescue' tools
- Requires more observation, recordkeeping
- More reliance on natural processes
- Have more regulation, paperwork



Transition to Organic Farming

Biophysical Transition

- 'Transition' effect – soil 3-5+ yr; insects 2+ yr
- Some pests increase, many decline
- Importance of site – minimize pest/disease potential
- More labor – weed control, fertility, sanitation
- More spraying, more sprayers?



Transition to Organic Farming

Economic Transition

- Organic won't save poor blocks of fruit/nuts
- Need 'reserve' fund – no transition premiums, higher cost and risk
- Need certified packer to work with
- Attract workers; shorter re-entry times
- Certification – time, fees



Business Analysis

Crop Trends – organic and conventional

- Are you late to the party?
- Area, prices, markets
- Competitors (farms, regions, countries)
- Data sources – World of Organic Ag; USDA-NASS OPS; USDA-ERS; State level data (CA, WA)

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2014 Organic Survey

Complete Report: [Text](#) | [PDF \(15.9 MB \)](#) | [CSV](#)

[Introduction](#)

Statistically Significant Corrections (released April 21, 2016): [Excel](#) | [PDF](#) | [ASB Notice](#)

Certified and Exempt Organic Farm Data	
PDF	Table 1. Farms, Land, and Value of Sales of Organic Agricultural Products -- Certified and Exempt Organic Farms: 2014
PDF	Table 2. Organic Sales as Percent of Market Value of All Agricultural Products Sold -- Certified and Exempt Organic Farms: 2014
PDF	Table 3. Value-Added Organic Product Sales -- Certified and Exempt Organic Farms: 2014

FiBL IFOAM ORGANICS INTERNATIONAL

FiBL & IFOAM – ORGANICS INTERNATIONAL

THE WORLD OF ORGANIC AGRICULTURE

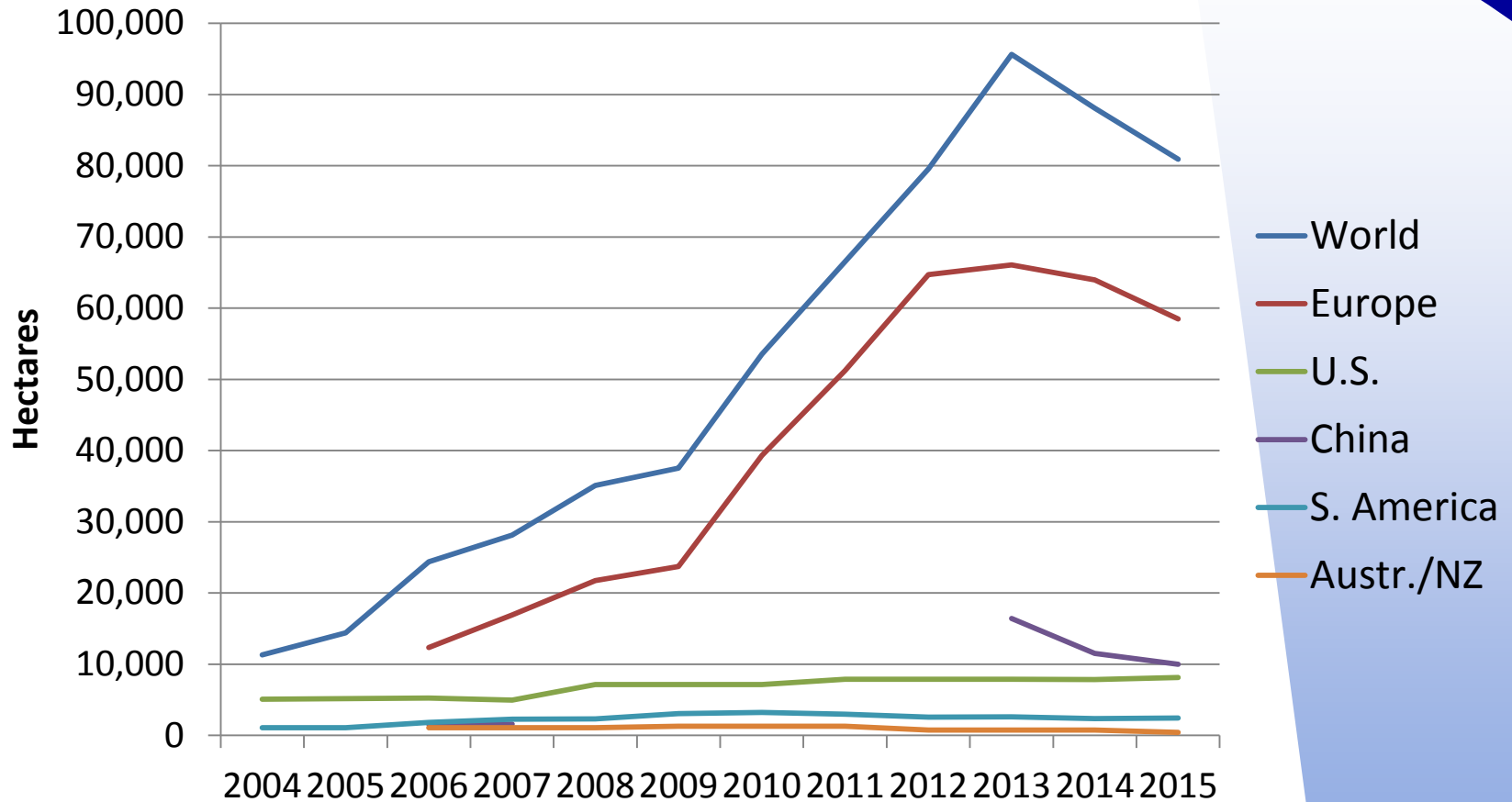
STATISTICS & EMERGING TRENDS 2017

EUROPE 32.7 MILLION HA
LATIN AMERICA 6.7 MILLION HA
OCEANIA 22.8 MILLION HA

Concentration of U.S. Organic Fruit

2014	U.S. Cert Ac	% of U.S. Production		
		<u>WA</u>	<u>CA</u>	
Apple	19,370	76 (93 F)	7	95
Pear	3,078	79	19	98
Cherry	2,769	94	4	98
Peach/Nect	4,324	17	75	92
Wine grape	14,025	8	85	93
Blueberry	4,898	53 F	37 F	90
Raspberry	585	4	89	93
Strawberry	2,962	<1	96	96
F=fresh		(USDA-NASS, 2015)		

Organic Apple Trends Expansion of Global Area



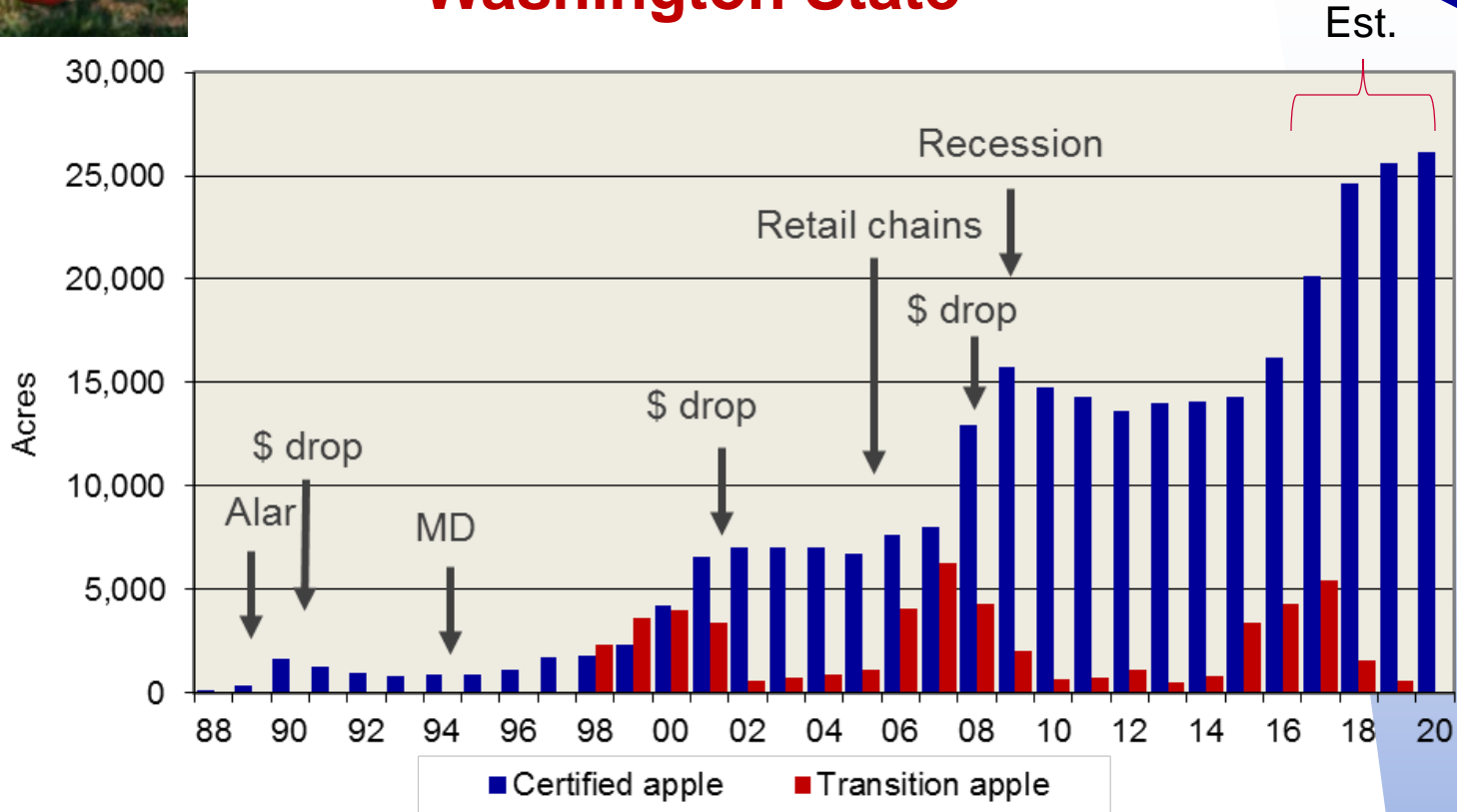
*Certified + Transition area
 1 hectare = 2.47 acres





Photo: F. Peryea

Organic Apple Acreage Washington State



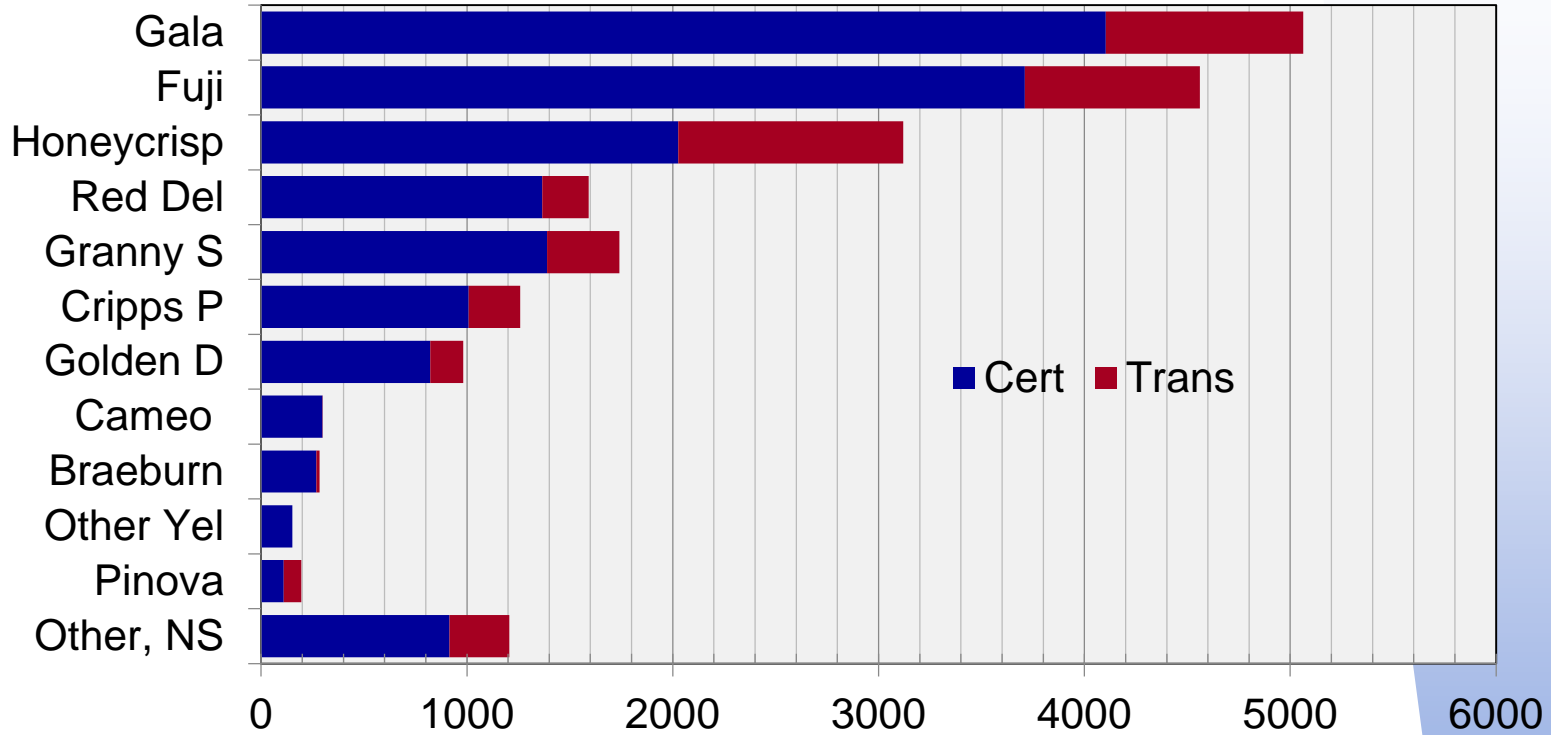
Organic (C+T) = 11.3% of WA apple bearing acreage (based on 2016 WSDA estimate of 180,961 acres)





WA Fuji; ARS Photo

Organic Apple Variety Acres Washington 2016



- Fuji and Gala = 48% of certified apple acres
- Honeycrisp tops Red and Granny since 2013
- Ambrosia, Autumn Glory, Envy, Jazz, Kanzi, Lady Alice, Opal = 506 ac cert.

Combined certifier data; Cripps Pink includes Pink lady; Pinova includes Pinata and Sonata.



Business Analysis

Markets, prices

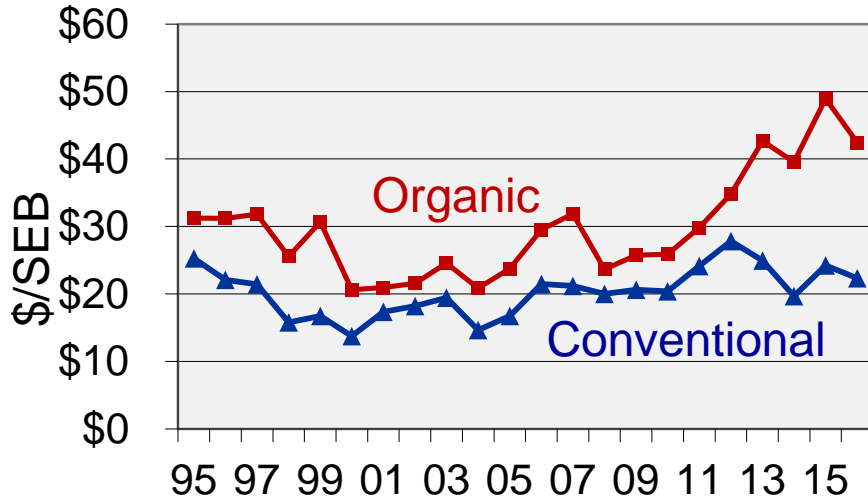
- Organic markets (2015): \$81.6 billion
- 51% N. Amer., 39% Europe, 8% Asia
- Data sources – OTA industry surveys, USDA-AMS, USDA-ERS, commodity groups (e.g. WSTFA), private reports



U.S. Organic Almond Market –
Analysis and Forecast to 2025.
IndexBox Marketing Ltd. **3,000€**

Prices 'Gala' Apples

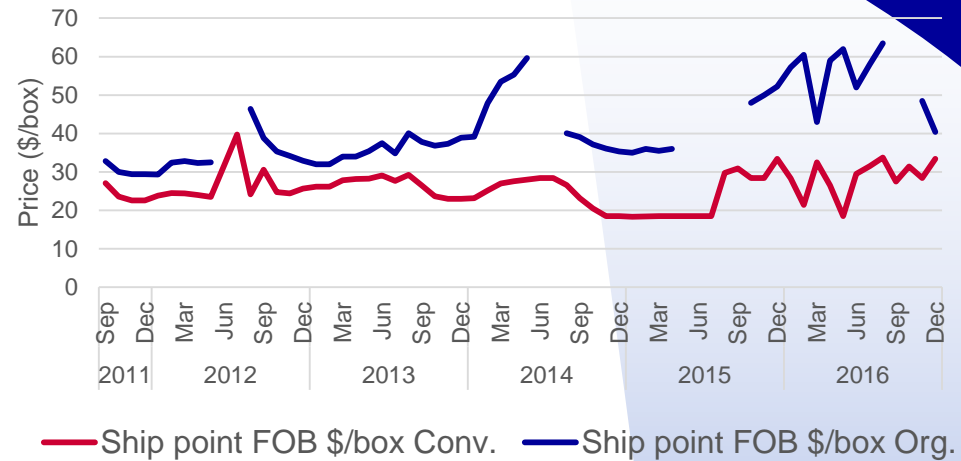
WA Fruit Industry Data



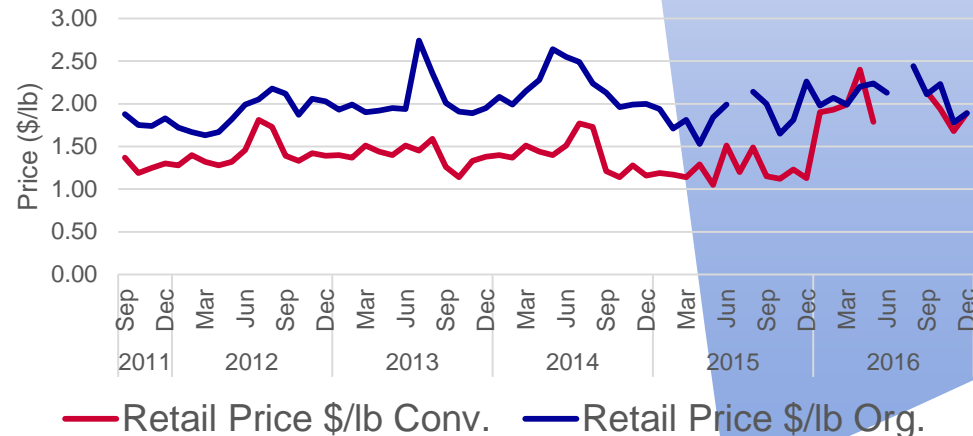
Source: WSTFA, WGCH

- Limited industry data
- USDA-AMS
- Private companies, e.g. Nielsen

Washington



National



Source: USDA-AMS

Business Analysis

Cost of Production Studies

	Oper. <u>cost</u>	Org. % of Conv. <u>Yield</u>	Net <u>return</u>
Avocado (2010, CA)	+18	-15	-52
Orange (1997, CA)	-24	-15	net +
Almond (2007, CA)	+26	-20	-68
Blueberry (2010, OR)	+7	NS	+125
Apple (2004-07, NY)	+9	NS	-25W, +12D
Apple (2014, WA)	+12	-8	+270

**WA Apple – Labor +15%, inputs +25%, weed control ++,
cost per bin +12%, price +42%**

Organic Yields

- Organic yields generally 70-85% of conventional worldwide
- Varies with specific crop and location

Yield Ratio = Organic yield (from WSDA data) / NASS yield for all WA

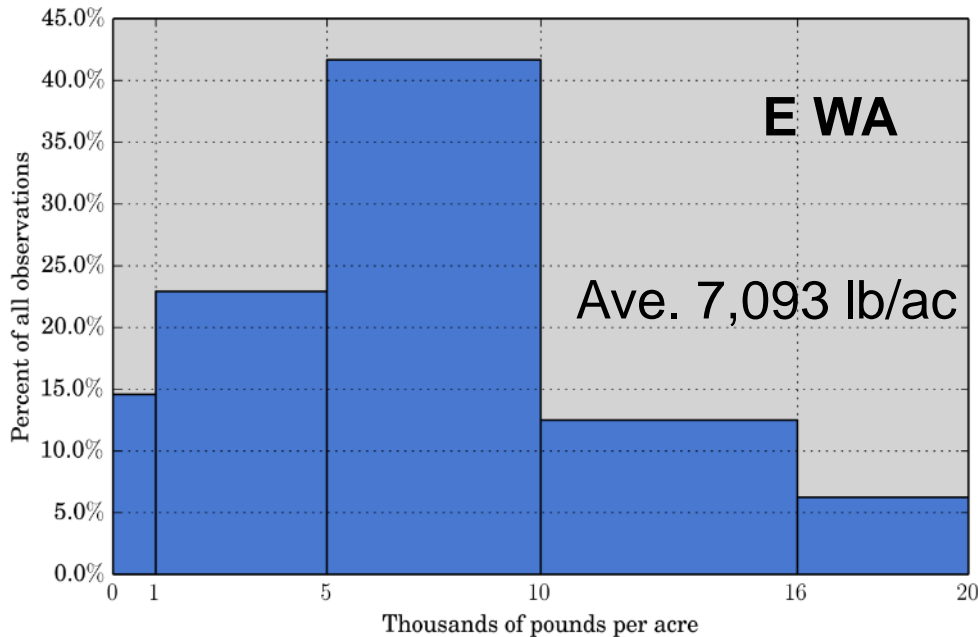
Crop	2009	2010	2011	2012	Ave.
Apple	0.90	0.92	0.79	--	0.87
Pear	0.89	0.72	0.63	--	0.68
Cherry	0.75	0.67	0.64	--	0.68
Grapes, juice	1.08	1.24	1.43	0.94	1.17
Blueberry	0.75	0.85	0.62	1.10	0.83
Raspberry	0.36	0.28	0.36	0.78	0.45
Hops	0.39	0.32	0.24	0.49	0.36

WA Organic Blueberry Yields 2009-2012

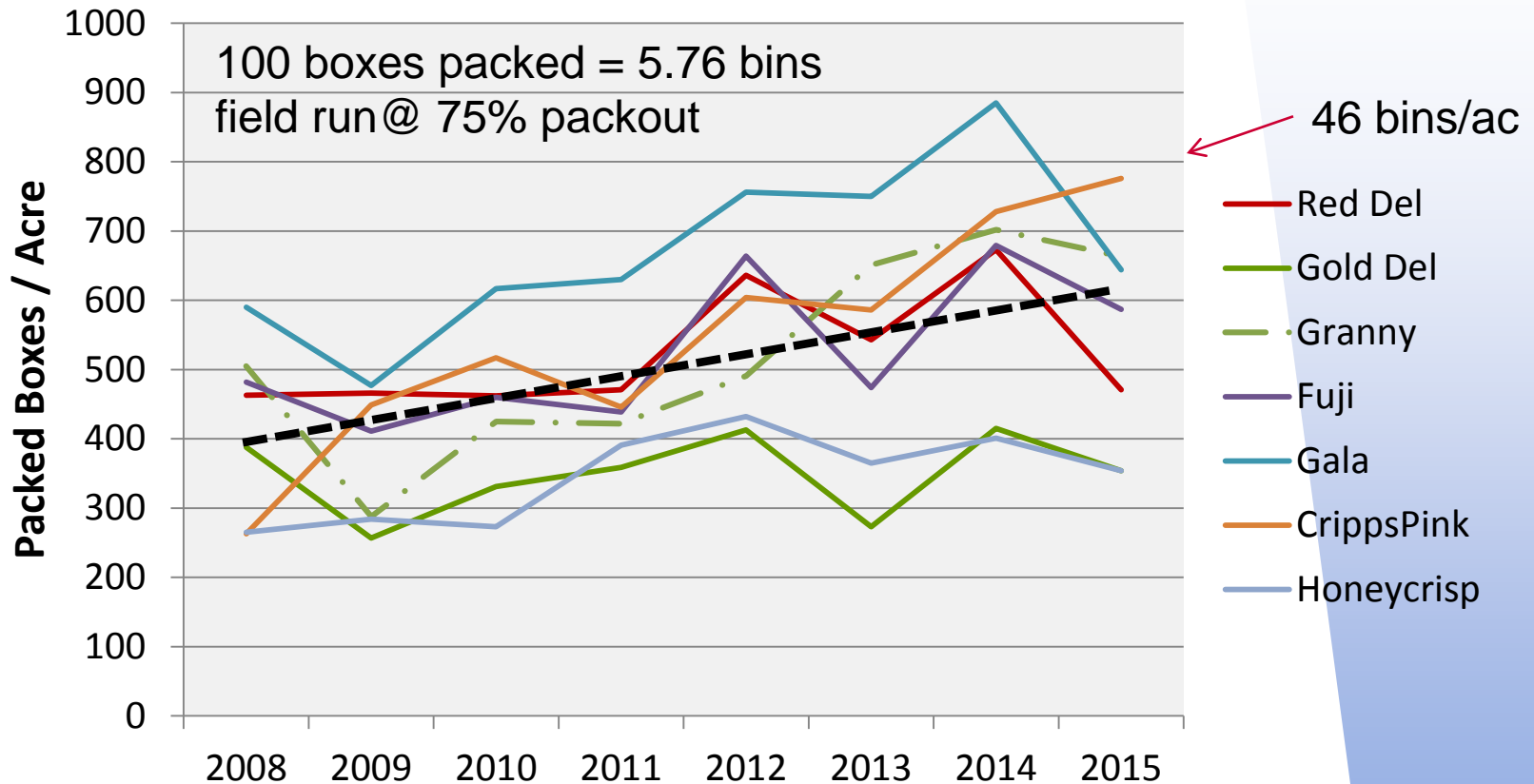


- Data not adjusted for age of planting
- E WA yields higher than W WA, show yield potential similar to OR budget (18,000 lb/ac)

NASS State
Ave. 8,417 lb/ac



Organic Apple Yield Trend - WA

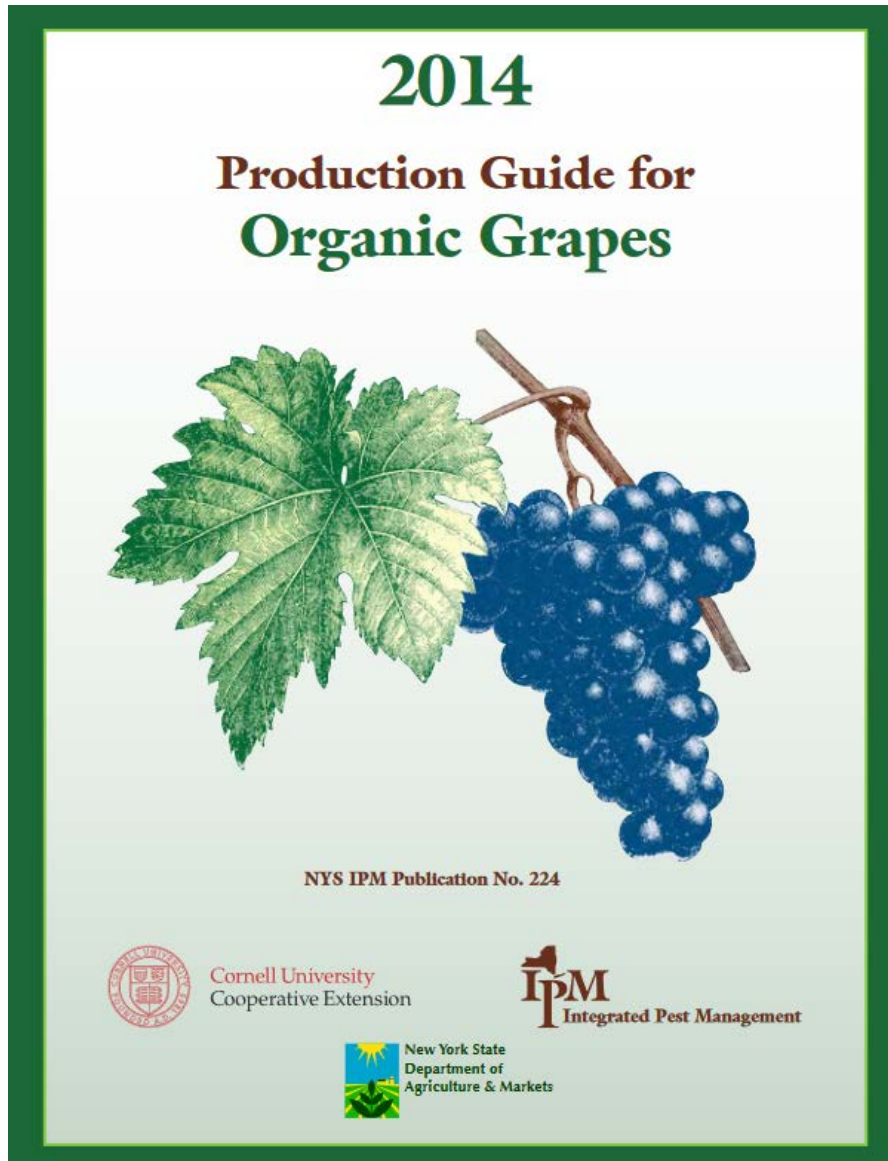


- Total shipped organic boxes / total certified acres
- Does not account for processor or other diverted fruit

Questions ?



Production



ATTRA

ews Funding Tutorials Webinars/Videos P

Apples: Organic Production Guide - IP020

PDF Price: \$5.95 for non-members

Kindle Price: \$5.95

- [Summary](#) • [Buy PDF](#) • [Buy Kindle](#) • [Buy Print Copy](#)

Apricot Diseases Identification Sheet - IP480

PDF Price: FREE

- [Summary](#) • [Download PDF](#) • [Buy Print Copy](#)

Blueberries: Organic Production - IP021

PDF Price: \$4.95 for non-members

- [Summary](#) • [Buy PDF](#) • [Buy Print Copy](#)

Brambles: Organic Production - IP022

PDF Price: FREE

- [Summary](#) • [Download PDF](#) • [Buy Print Copy](#)

Cherries: Organic Production - IP463

PDF Price: \$0.99 for non-members

Production

Genotype x Environment

- Crop adaptation to your environment
- Pest and disease challenges
- Drier climates, cold winter = fewer problems
- Organic apples – northern Germany vs Washington State

Varieties with resistance/tolerance to key pests and diseases

- Suited to your climate?
- Accepted in the market?
- More vigorous roots to compete with weeds?



Production

Soil

- Foundation of organic farming
- Resolve soil problems before planting – SOM, pH, structure/compaction, replant disease.
- Address the carbon cycle – recycle orchard C, import C

Orchard

Prunings

Leaves

Cover crop

Imported

Compost

Mulch

Humates, etc.

AgCanada research – positive tree response
82% of time with mulch vs 33% with incorp.
amendment

Soil Organic Matter

Feed the soil...

...the **green**



...and the **brown**



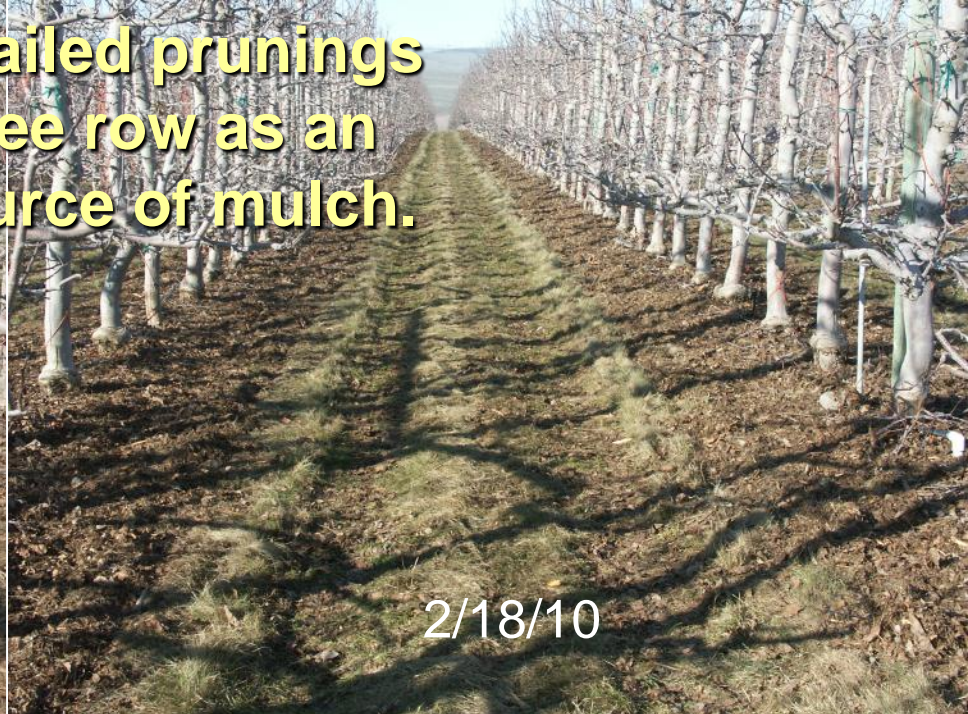
Nobili side delivery
flail mower (Italy)
and planted cover
crop



**Sweeping flailed prunings
onto the tree row as an
internal source of mulch.**



2/18/10



2/18/10



2/18/10



4/30/10

Production

Nutrients

- Crop nutrient removal, ratios
- Excess P can tie up Zn; excess K can interfere with Ca
- Compost vs organic fertilizer

<u>N</u>	<u>P</u>	<u>K</u>	(lb/ac)
13	1	28	50 bin apples, removal
13	78	305	10 tons/ac cow compost, 10% Nmin
13	0	0	142 lb feathermeal (75% Nmin)

- 'Decay' series for organic fertilizers
- Alley legumes for N

Alley Vegetation

Legumes for N Fixation



Alfalfa



Trefoil

Year 3, 2010

39 days after mowing; initially direct seeded

**Add 30- 90 lb avail. N/ac/yr;
US\$0.65/lb N**

Production

Weed Control

Why control weeds ?

- Limit competition with young trees: nutrients, water
- Minimize rodent habitat
- Weeds as hosts for pests, disease inoculum
- Avoid blocked sprinklers

Bigger issue in younger plants

Perennial weeds – clean up
before transition; poor organic
tools



Orchard Weed Control Options

	Pro	Con
Herbicides	Control weeds around trunk; rodents; no tree, root damage	Resistance, leaching, soil quality loss; effectiveness, cost (org herbicides)
Mowing	Fast, inexpensive	Short-term suppression; still have competition, habitat
Tillage	Effective; rodents; low cost	↓ tree growth, fruit size, soil quality; damage trees
Flaming	Control weeds around trunk; rodents; low cost	Tree injury, perennial weeds, fossil fuel
Inert mulches	Effective; soil quality; moisture	Costly; N tie up; soil quality
Living mulches	Add biodiversity; soil quality; fix N	Competition; rodents; persistence

(Granatstein & Mullinix, 2008) 28

How to combine strategies? Change system with age of orchard?

Weed Control Costs in Organic Orchards

	<u>\$/ac/yr</u>	<u>Year</u>
Flame weed + hand hoe	208	2014
Weed fabric (10 yr, open/close)	420	2014
Flaming (5x)	113	2012
Tillage (5x, Wonder Weeder)	115	2012
Wood chip mulch (3 yr life)	400	2012
Org. herbicide (4x)	508	2012
Mowing	210	2010

For more details, see the on line presentation

<http://treefruit.wsu.edu/videos/weed-control-in-orchards/>



Weed Mgt. and Yield - WA

	Tillage	Mulch
Weed control cost (3-yr)	\$343/ac	\$1,202/ac
	Apple	Pear
Yield increase mulch vs till	+65%	+17
Net increased revenue (3-yr) mulch vs till	\$4,777/ac	\$1,432/ac

Tillage Effects

3-yr old high density apple, South Africa

Treatment	Stem Circ. (mm)	Pruning Mass (g/2 trees)
Herb. Strip	100.3 a	604 a
Mech. Cult.	85.2 b	234 b

(Wooldridge and Harris, 1989)

Tillage



Wonder Weeder

JUL 27 2002



Weed Badger



Weed brush



Ladurner

Mowing



Photo: T. Pitts

Weed fabric



Flaming



Wood chip mulch



Production

Rodents

- Species vary with region; voles, rabbits for girdling; gophers for root damage
- Few organic controls
- Wood chip mulch = bare ground
- Mousetraps – 20 ac orchard, 1 per 40 ft, tied to posts, or about 125/ac, organic peanut butter; ~\$50-60/ac/year to bait and check 3 times



Photo: M. Robinson

Winter 2016/17

- Traps in non-cultivated organic had similar control as baited weed strip
- Most injury with weed fabric

Production

Irrigation

- If polytube, hang on wires or trees, off ground to allow weed control
- Monitor water; avoid over-irrigation and loss of expensive N

Pruning

- Maintain open canopy for good air movement, sun penetration – want fast drying



Trellis

- Wood, steel, concrete, other?
- Cannot replace treated wood into certified land

Production

Equipment

- Sprayers – dedicated, or need excellent cleanout process and records; tower sprayers give better coverage
- Soil amendments – handling; side delivery spreaders
- Side delivery mower
- Bins – dedicated, or cleanout; wood bins previous in conventional can be contaminated
- Storage – contamination from wood walls, ventilation systems, e.g. DPA



Photo: E. Hogue

Production

Other Factors

Location

- Climate, microclimate (e.g. fire blight)
- Pest management by neighbors
- Natural habitat (beneficial insects)



Higher level of management

- Prevention first, timeliness; fewer “rescue” tools
- Oversight – avoid mistakes by workers, etc.
- Observation skills – scouting, walking the orchard, keeping records
- “Holistic” thinking – parts of the system are connected

Production

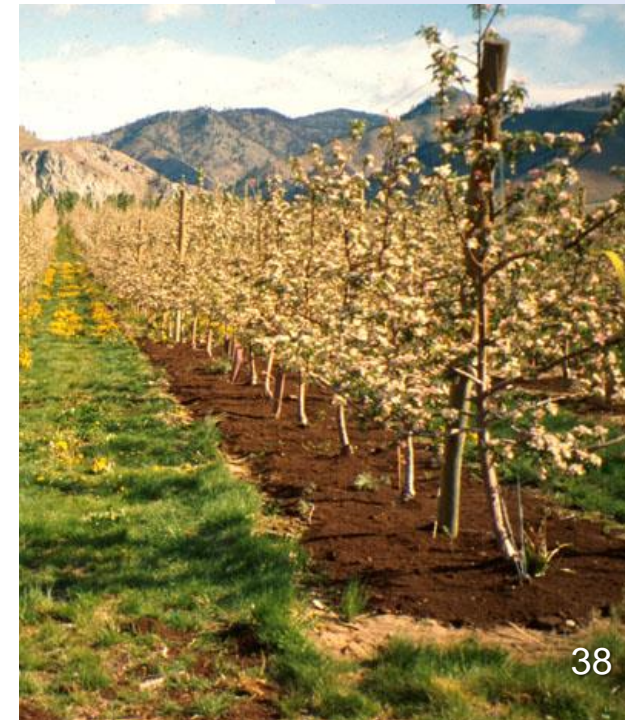
**Protected cultivation for
pests, diseases, quality**



**Organic cherries,
Germany**

Summary

- Evaluate economics
- Suitable crop for the location
- Get advice
- Big challenge - pest and disease control
- More attention to soil, nutrition
- Invest in best practices, tools rather than cut costs



Information Sources

- National Organic Program (NOP)
- ATTRA / NCAT
- eOrganic
- Certifiers (e.g. Oregon Tilth, CCOF, WSDA)
- Extension publications
- Meetings and conferences
- USDA-NRCS
- Organic eprints
- Journal articles

