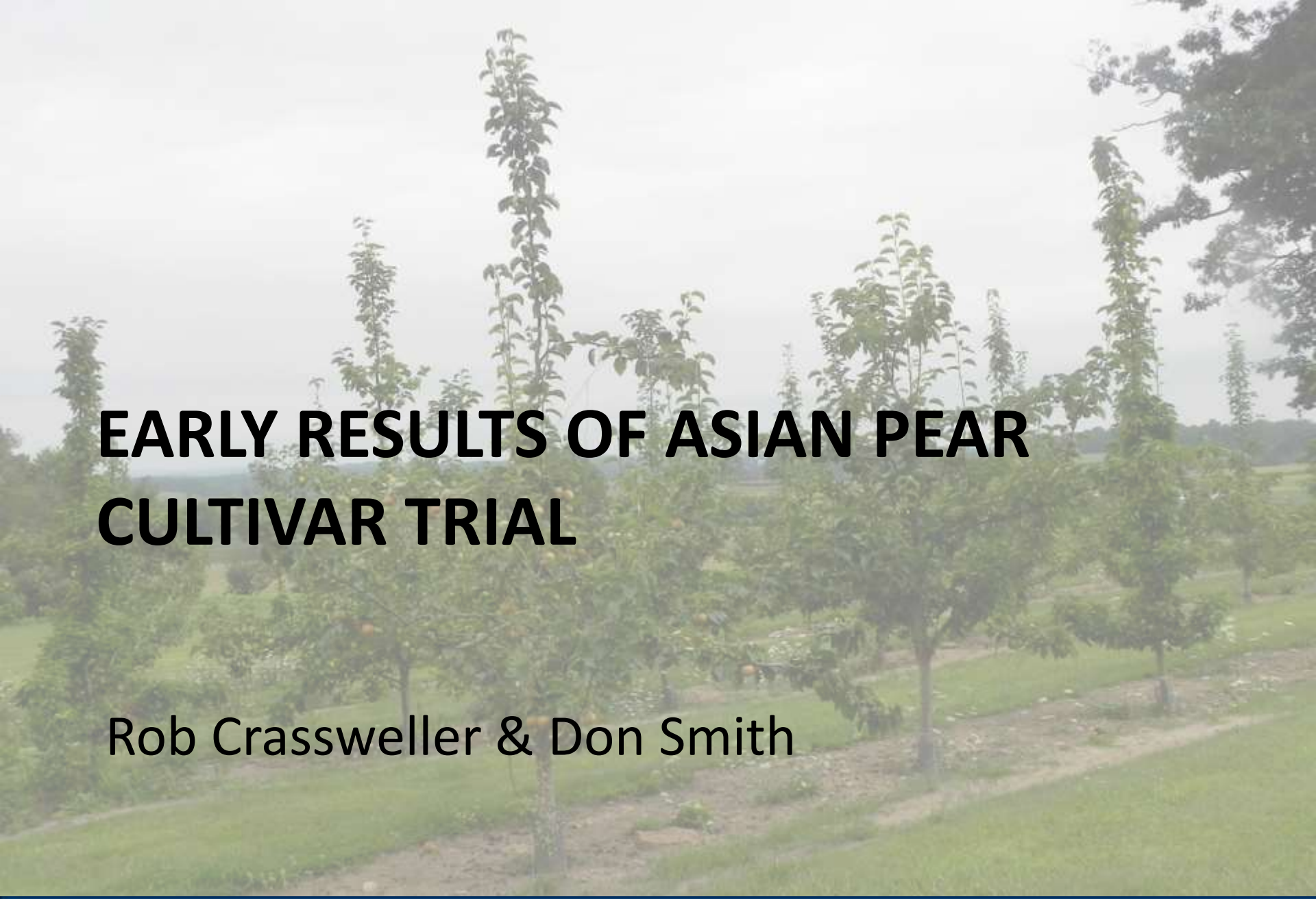


EARLY RESULTS OF ASIAN PEAR CULTIVAR TRIAL

Rob Crassweller & Don Smith

Asian Pears: Background

- Pyrus pyrifolia vs Pyrus communis
- Various Names
  - Nashi (Japanese for “pear”)
  - Oriental
  - Chinese
  - Japanese pears (Nihonnashi)
  - Sand apples
  - Apple pears (~Fresh market reports)
- Grown for 2,000 yrs. in Asia
- Estimated 3,000 cultivars

Asian Pears

- Primarily used for fresh consumption
- Variable susceptibility to fire blight
  - Have lost 3/5 Shinsui in planting
- Susceptible to bruising and skin abrassion
- High ethylene in storage can hasten skin browning
- Large orchard in Coopersburg, PA
  - Subarashii Kudamono = “Wonderful Fruit”

Asian Pear Cultivar	Fireblight Status*
Hosui	susceptible**
Olympic	tolerant
Chojuro	somewhat susceptible
Niitaka	somewhat susceptible
Shinseiki	somewhat susceptible
20th Century (Nijiseki)	somewhat susceptible

*Source – Chris Walsh, University of MD

**Although considered susceptible, it is much less susceptible than Bartlett pears and usually survives an infective event.

Classifying Asian Pear Types

- Skin color change - Green to:
  - yellow green – Shinseiki, Ya Li,
  - Golden brown – Hosui, Kosui, Niitaka, Shinko
- Prominent lenticels present
- Chinese types vs. Japanese Types
  - Chinese bloom earlier than Japanese

Multi-State Asian Pear Planting

- Planted in 2010
- AL, IL, MA, MD, NC, NJ, NY, PA, WV
- 11 cultivars all on *Pyrus betulafolia*
- Planted 10’ x 20’
- Atago, Hosui, Ishiiwase, Kosui, Niitaka, Olympic, Shinko, Shinseiki, Shinsui, Ya Li, Yoinashi

Fruit characteristics

- Shinseiki = New Century – round greenish yellow, cold hardy
- Kosui = Good Water – yellow bronze with russet
- Hosui = Much Water – golden russetted with prominent lenticels


Shinseiki


Kosui


Hosui

Fruit Characteristics (cont.)

- Niitaka – orange brown russetted, pollen sterile
- Olympic = Korean Giant – round large russetted brown, longest storage life
- Ishiiwase – greenish brown, long stemmed fruit

Fruit Characteristics (cont.)

- Ya Li = Duck Pear – greenish yellow pyriform (pear shape), FB & Psylla resistant, low chill
- Shinsui – light yellow brown russetted fruit
- Yoinashi = Good Pear – light brown to golden brown russet

Fruit Characteristics (cont.)

- Atago replacement for Niitaka, with long bloom, solid orange brown
- Shinko – medium to large fruit, brown to golden-brown russet

Tree Size at end of 2014

- TCSA largest was Hosui and smallest was Kosui but not significantly different
- Tree size after 5th leaf
  - Tallest Hosui – 14.2 ft.
  - Shortest Shinko – 10.1 ft.
  - Widest Shinsui – 7.6 ft.
  - Narrowest – Ishiiwase – 5.4
- Generally tall narrow trees

Flowering

- 2010 planted on April 23 and any flowers were removed
- 2011 Flowers counted and fruitlets removed
  - Shinsui had least number of flower clusters (1.0)
  - Shinko had most number of flower clusters (20.0)
- 2012 Flowers counted
  - Ya Li had least number of flower clusters (11.0)
  - Atago had most number of flower clusters (122.4)
- 2013 Flowers counted
  - Shinsui had least number of flower clusters (46)
  - Ya Li had lowest flowering density
  - Atago had most number of flower clusters (247)

Time of Bloom @ Rock Springs

- Average Date of full bloom
  - 2012 – 4 April
  - 2013 – 5 April
  - 2014 – 10 May

2014 Flowering and Harvest Dates @ Rock Springs

Cultivar	Full Bloom	Actual Harvest		Actual Days to Harvest
Shinsui	5/12	8/28	9/5	108
Kosui	5/12	9/5	9/19	116
Ishiiwase	5/12	9/5	9/19	116
Shinseiki	5/9	9/2	9/19	116
Hosui	5/11	9/8	9/29	120
Yoinashi	5/9	9/22	10/10	136
Ya Li	5/10	10/2	10/13	145
Niitaka	5/12	10/17	10/27	158
Atago	5/9	10/24	11/7	168
Shinko	5/9	10/27	11/7	171
Olympic	5/12	11/4	11/11	176

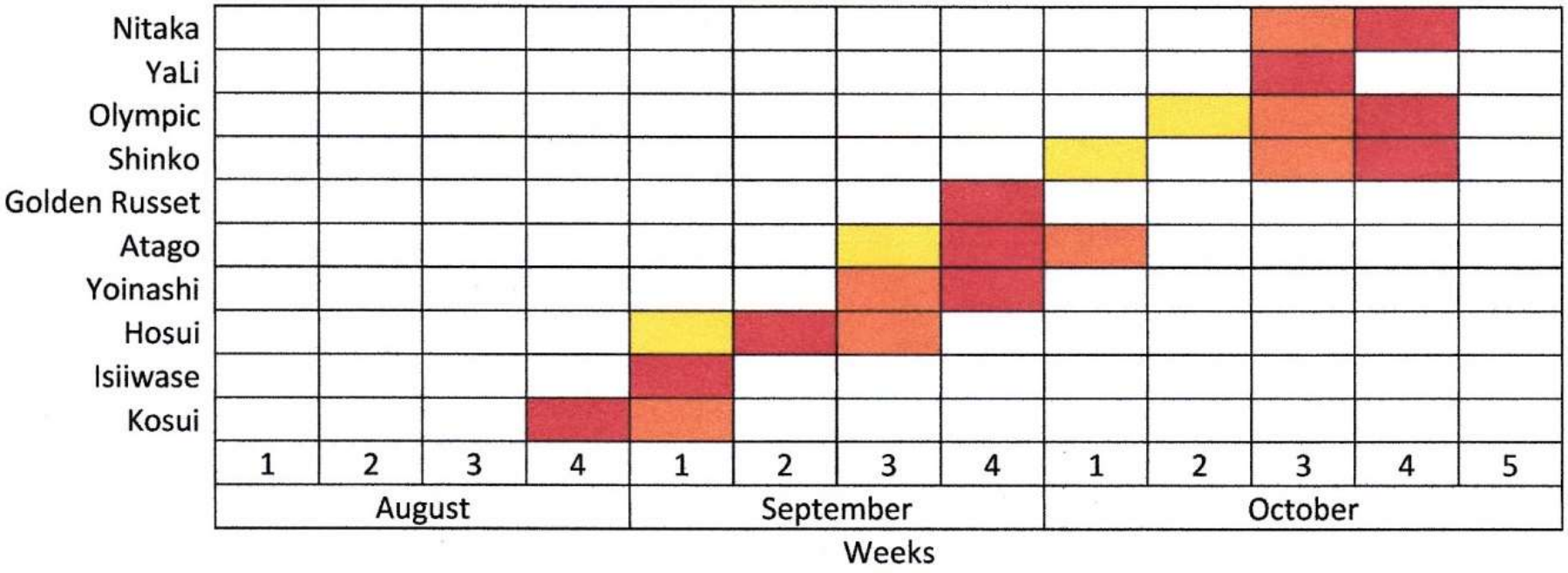
2014 Asian Pear Cultivar Harvest Dates

Cultivar	Main Harvest Date (%)	Date Range	# Harvests
Shinsui	Aug. 28 – Sept. 2 (98%)	Aug. 28 - Sept. 5	3
Shinseiki	Sept. 11 – Sept. 15 (56%)	Sept. 2 - Sept. 19	6
Kosui	Sept. 11 (43%)	Sept. 5 - Sept. 19	5
Ishiiwase	Sept. 6 – Sept. 11 (68%)	Sept. 8 - Sept. 19	4
Hosui	Sep 11 (26%)	Sept. 8 - Sept. 29	7
Yoinashi	Sept. 29 – Oct. 2 (67%)	Sept. 22 - Oct. 10	6
Ya Li	Oct. 13 (74%)	Oct. 2 - Oct. 13	6
Niitaka	Oct. 27 (50%)	Oct. 17 - Oct. 27	4
Atago	Oct. 24 (34%)	Oct. 24 - Nov. 7	5
Shinko	Oct. 24 (48%)	Oct 27 - Nov. 7	4
Olympic	Nov. (11 71%)	Nov. 4 - Nov. 11	3

Percent of Fruit Harvested by Date in 2014

	8/28	9/2	9/5	9/8	9/11	9/15	9/19	9/22	9/25	9/29	10/2	10/6	10/10	10/13	10/17	10/20	10/24	10/27	10/31	11/4	11/7	11/11
Shinsui	42	56	2																			
Shinseiki		11	13	8	29	27	11															
Kosui			18	13	43	17	9															
Ishiiwase				32	36	17	15															
Hosui				6	28	22	14	5	18	7												
Yoinashi								7	15	34	33	2	9									
Ya Li											8	7	11	74								
Niitaka															17	13	20	50				
Atago																	34	13	17	11	25	
Shinko																		48	7	22	23	
Olympic																				11	18	71

2013 Asian Pear maturity dates, Rutgers Snyder Research and Extension Farm, Pittstown, NJ



Color sequence represents increasing yield at each spot pick, red color equals highest yield.

From Cowgill & Magron. 2014. Maturity standards for Asian pear harvest. Horticultural News 94, Spring, 2014

Wye Research & Extension Center, Queenstown, MD*

Cultivar	Mean Harvest Date	Trunk Cross Sectional Area, (cm2)	Yield (kg)	Yield Efficiency (kg/cm2)	Tree Survival (%)
Shinsui	10-Aug	29.7 b	4.8 b	0.17 cd	100%
Hosui	11-Aug	29.1 b	9.1 b	0.45 bcd	60%
Isi'iwase	12-Aug	37.8 ab	4.8 b	0.13 d	100%
Kosui	17-Aug	29.2 b	4.2 b	0.15 d	100%
Atago	24-Aug	23.5 b	17.3 ab	0.92 ab	60%
Yoinashi	30-Aug	27.2 b	7.8 b	0.34 cd	80%
Shinko	11-Sep	22.8 b	23.2 a	1.05 a	100%
Olympic	1-Oct	29.4 b	15.4 ab	0.53 bc	100%
Ya Li	1-Oct	32.1 ab	17.6 ab	0.5 bcd	40%

*Courtesy of Dr. Chris Walsh

Days After Full Bloom to Midpoint of Harvest in 2014

Cultivar	3 yr. Average DAFB
Shinsui	122
Kosui	131
Hosui	138
Shinseiki	145
Yoinashi	165
Niitaka	176
Atago	177
Ya Li	179
Shinko	187
Olympic	193
Ishiiwase	NA

Cultivar	Soluble Solids, % in 2014*	First Harvest
Shinseiki	10.6 a	2-Sep
Ya Li	10.9 ab	2-Oct
Shinko	11.6 ab	27-Oct
Niitaka	11.7 ab	17-Oct
Ishiiwase	11.7 ab	8-Sep
Atago	12.4 bc	24-Oct
Yoinashi	13.3 cd	22-Sep
Hosui	13.5 cd	8-Sep
Kosui	14.4 de	5-Sep
Olympic	14.6 de	4-Nov
Shinsui	15.4 e	28-Aug
P-Value	0.0001	

* Average of a sample collected from 5 fruits on 2nd or 3rd harvest

Cumulative Data 2010 – 2014 @ Rock Springs				
Cultivar	# Fruit/tree	Yield/tree, kg	Efficiency, kg/cm^2	Avg. Fruit wt, g
Shinsui	104 a	13.74 ab	0.348 ab	148 a
Ishiiwase	46 a	7.58 a	0.213 a	194 ab
Kosui	46 a	9.50 a	0.360 ab	199 abc
Shinko	157 a	26.89 ab	1.210 abc	203 abc
Hosui	187 a	33.67 ab	0.702 abc	210 abc
Ya Li	118 a	24.20 ab	0.619 abc	224 abc
Yoinashi	94 a	18.76 ab	0.526 abc	232 abc
Shinseiki	174 a	35.00 ab	1.098 abc	242 abcd
Niitaka	79 a	21.38 ab	0.762 abc	285 bcd
Atago	185 a	42.34 b	1.251 bc	296 cd
Olympic	115 a	32.84 ab	1.395 c	347 d
P-Value	0.0567	0.0039	0.0025	0.0001

	Cumulative data 2010 - 2014			
Cultivar	# Fruit/tree	Yield/tree, kg	Efficiency, kg/cm^2	Avg. Fruit wt, g
Ishiiwase	46a	7.58a	0.213a	194ab
Shinsui	104a	13.74ab	0.348ab	148a
Kosui	46a	9.50a	0.360ab	199abc
Yoinashi	94a	18.76ab	0.526abc	232abc
Ya Li	118a	24.20ab	0.619abc	224abc
Hosui	187a	33.67ab	0.702abc	210abc
Niitaka	79a	21.38ab	0.762abc	285 bcd
Shinseiki	174a	35.00ab	1.098abc	242abcd
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Atago	185a	42.34 b	1.251 bc	296 cd
Olympic	115a	32.84ab	1.395 c	347 d
P-Value	0.0567	0.0039	0.0025	0.0001

Letters refer to Tukey-Kramer mean separation, P=0.05

Internal Browning

- Development of brown to dark brown water-soaked areas in the core and/or flesh during storage
- Usually confined to the Chinese cultivars
- Early harvest may help reduce problem when fruit are slight yellow
- Prompt cooling is required

Crisosto, C. H., Kevin R. Day, Steve Sibbett, David Garner, and Gayale Crisosto. 1994. *Late harvest and delayed cooling induce internal browning of 'Ya Li' and 'Seuri' Chinese pears*. HortScience 29(6) 667-670.

Olympic flesh browning

Resources

“USDA Pear Germplasm Repository”

Resources (cont.)

Penn State **Extension**

Ag Innovations Series

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For more information, go to www.sare.org/project-reports and search by project number.

Written by Daniel Ward and Winfred Cowgill, with assistance from Robin Meadows.

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Cost-Effective Asian Pear Thinning for Productivity and Fruit Quality

Geographic Adaptability: The techniques discussed here are applicable to Asian pears grown in the eastern United States.

Introduction

Asian pears (*Pyrus pyrifolia*, *Pyrus ussuriensis*) are a valuable crop in the northeastern United States. In New Jersey, for example, urbanization has led many fruit growers to sell directly at roadside stands and farmers' markets. The high demand for Asian pears provides an opportunity for diversified production that is critical to grower survival. Already, there are more than 1,000 acres of Asian pears in the Northeast, with room for expansion now that this fruit has entered the mainstream market.

Asian pear orchards that are high in productivity, fruit size and fruit quality can gross up to $40,000 per acre. However, to fetch an optimum price, Asian pears must be about 4.5 inches across. Achieving this size along with optimum yield requires substantial fruit thinning because this type of tree blooms so heavily (Fig. 1a, b). In the past, however, most Asian pear thinning has been done by hand, which is time-consuming and expensive. For example, hand-thinning Asian pears costs about $1,000 to $4,000 per acre, depending on the size and density of the trees as well as the crop load.

To provide Asian pear growers with more sustainable, cost-effective thinning

PUBLISHED NOVEMBER 2013

Resources

“Asian Pear Cultivar Trial in New Jersey and Massachusetts”
from MA Fruit Notes

“Field Performance of Asian Pear Cultivars in the Hot, Humid Summer Conditions of the Mid-Atlantic Region of the United States” by C. S. Walsh et al. to be published in Acta Horticulturae


Questions?