

EVALUATION OF NEW USDA ADVANCED FIRE BLIGHT-RESISTANT PEAR SELECTIONS

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ABSTRACT

'Bartlett' accounted for 81% of California production and 76% of pear acreage in 2013, being used for both fresh and processing (USDA-NASS 2014). All other cultivars comprised 19% of production and 24% of acreage, with 'Bosc' the majority (NASS 2014). Growers and marketing organizations see promise in growing new cultivars for specific markets and customers, and industry is thus supportive of trialing new selections (Boyd 2013). Five new USDA numbered fire blight-resistant selections and one newly-released named cultivar on OHxF 87 rootstock were planted May 2, 2013 in a replicated trial on deep Russian loam soil along the Russian River in Hopland, Mendocino County, California: US 71655-014 ('Gem'¹), US 69426-038, US 84907-069, US 84907-078, US 84907-166, with 'Bartlett' as the control. Trees were headed to 30 inches with no further pruning except removing growth below the first wire to avoid herbicide damage. There have been no losses except for 'Gem', which was removed in fall 2014 after being found to be infected with pear vein yellows. Data collected in 2014 included trunk cross sectional area (TCSA), height, and fruit number. 'Bartlett' trees tend to be taller than the numbered selections, but there are significant block differences, possibly due to planting down the row. US 84907-166 was the only selection to flower and bear fruit (average 4 per tree). Number of newly-formed spurs averaged 1-2 per tree but few new laterals formed (1-3 per tree). Data collection will continue in 2015 and results will be compared to those from a similar trial in the Sacramento Delta, as well as from other U.S. locations.

INTRODUCTION

The number of commercially-available pear cultivars is very few relative to apples (Karst 2013, Schrack 2007). California primarily markets six specific cultivars: 'Bartlett', 'Bosc', 'Buerre Prococe Morettini' (aka 'Sunsprite', 'Comice', 'Forelle', and 'Seckel'). There are also a number of red skinned cultivars grouped as "Red Pears" for marketing purposes, among them, Hailey RedTM Bartlett, 'Red Sensation Bartlett', and 'Red Clapp's Favorite' (aka 'Starkrimson', 'Super Red') (CPAB 2015). Bartlett accounted for 81% of California production and 76% of the acreage in 2013 being used for both fresh and processing (USDA-NASS 2014). All other cultivars comprised 19% of production and 24% of acreage, with Bosc the majority (NASS 2014). Also in contrast to apple, none of the seven cultivars or cultivar "categories" is recently developed or released, despite the availability of multiple possibilities, including the USDA fire blight-resistant cultivars 'Sunrise' and 'Blakes Pride' (Bell 2014), fully russeted Bartlett sport 'Cinnamon' from Fowler Nurseries, and fire blight resistant Ag Canada releases ACTM Harrow Sweet and Harovin Sundown. These, as well as

others, have been favorably received in consumer taste tests (Elkins 2006 and 2005, Elkins et al 2008). 'Sunrise' and 'Cinnamon' in particular continue to perform well in local trials (Ingels 2014).

Despite the slow pace of industry acceptance, some growers and marketing organizations see promise in growing new cultivars for specific markets and customers, and industry is thus supportive of trialing new selections (Boyd 2013). In this context, five new numbered fire blight-resistant selections and one newly-released named cultivar were planted in a replicated trial on deep Russian loam soil along the Russian River in Hopland, Mendocino County, California. Fire blight resistance is derived from Seckel and eating quality from Bartlett and others. This trial succeeds a previous similar one of five selections planted in Scotts Valley (Lakeport), Lake County in 1995, from which Blakes Pride and Sunrise emerged as potential commercially-acceptable cultivars.

¹ 'Gem' was released by USDA in 2014 and is being propagated for commercial sales in Hood River, Oregon. Unfortunately, trees were discovered to be infected by pear vein yellows, and removed from the Hopland location in November 2014.

PROCEDURES

Selections originally included US 71655-014 ('Gem'¹), US 69426-038, US 84907-069, US 84907-078, US 84907-166, with 'Bartlett' as the control, and OHxF 87 the rootstock (Figure 1). Trees were planted May 2, 2013 in a randomized complete block design (4 single tree replicates) north to south down a portion of one row and headed to 30'. No other formal pruning has been done to date except removal of all growth below the first wire to avoid damage by herbicides. Data collected in 2014 included trunk cross sectional area (TCSA), height, and fruit number.

2014 RESULTS AND 2015 PLANS (Table 1)

Trees have grown well and there have been no losses except for 'Gem' (see footnote). Bartlett trees tend to be taller than the numbered selections, but there are significant block differences, possibly due to planting down the row. US 84907-166 was the only selection to flower and bear fruit (average 4 per tree). Number of newly-formed spurs averaged 1-2 per tree but few new laterals formed (1-3 per tree).

Data collection will continue in 2015. Minimal pruning will consist only of removing crossing, broken, or poorly placed branches. Results will be compared to those from the Sacramento Delta trial overseen by U.C. Cooperative Extension Farm Advisor Chuck Ingels.

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Table 1. Effect of cultivar selection on number of spurs and feathers, number and size of fruit, tree heights, and cultivar trunk cross-sectional area (TCSA) of 2nd leaf pear trees on OHxF 87 rootstock, Hopland, Mendocino County, California, 2014.

	No. of Spurs (per tree)		No. of Feathers (per tree)		Total Clusters (per tree)	No. Fruit (per tree)	Fruit Size (g)	Tree Ht. (cm)	Cultivar TCSA (cm ²)
	New (3/11)	Old	New (3/11)	Old					
CULTIVAR SELECTIONS¹									
US 69426-038	1.7	0.0	2.3	4.0	0.0	0.0 b	0.0 b	136 ab	5.0 ab
US 84907-069	1.5	0.0	2.7	3.3	0.0	0.0 b	0.0 b	124 b	2.9 b
US 84907-078	1.7	0.0	1.7	4.0	0.0	0.0 b	0.0 b	144 ab	4.8 ab
US 84907-166	1.3	0.0	1.0	3.7	3.3	4.3 a	30.5 a	171 a	4.6 ab
Bartlett	1.1	0.0	1.0	3.3	0.0	0.0 b	0.0 b	153 ab	6.2 a
ANOVA²									
Cultivar Selections (P-value)	NS (0.33)	~	NS (0.39)	NS (0.83)	NS (0.46)	* (0.05)	NS(0.08)	NS (0.23)	NS (0.13)
Block (P-value)	NS (0.19)	~	NS (0.12)	NS (0.31)	NS (0.41)	NS (0.41)	NS(0.41)	* (0.05)	** (0.01)

¹ Within columns, cultivar treatment means significantly different (Duncan Multiple Range test, $P \leq 0.05$. $P \leq 0.1$ for fruit size and tree height.)

² *, ** Indicate significance at $P \leq 0.05$ and 0.01 respectively. NS indicates not significant.

					BARSECK	BARTLETT
						SECKEL
	BARTLETT			MICHIGAN-US 437		
			US 309		BARTLETT	
US 84907-069						
US 84907-078		US 56112-146		ROI CHARLES DE WURTEMBERG		
US 84907-166			OPEN-POLLINATED			
	US 65062-040				BARTLETT	
				BARSECK	SECKEL	
			MICHIGAN-US 437			
		US446		BARTLETT		
			DOYENNE DU COMICE			
					BARTLETT	
				BARSECK	SECKEL	
			MICHIGAN-US 437			
		US 309		BARTLETT		
	US 56112-146		ROI CHARLES DE WURTEMBERG			
		OPEN-POLLINATED				
US 69426-038				BARTLETT		
			BARSECK	SECKEL		
		MICHIGAN-US 437				
	DAWN		BARTLETT			
		DOYENNE DU COMICE				

Figure 1. Pedigrees of advanced USDA fire blight resistant pear selections, planted in Hopland, Mendocino County, California, 2013.