

Two crops from your raspberries: does it make economic sense?

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What is double cropping?

Methods

Costs and benefits



North American
Raspberry & Blackberry
Association



AgBioResearch
Michigan State University

Michigan State
Horticulture Society

Double cropping primocane fruiting raspberries:

Overwintered floricanes produce in the summer; new primocanes fruit in fall.

Remnants of fall
primocane fruit

Basal floricanes buds
develop fruit in July.



Double cropping varieties need:

1. Sufficient winter hardiness
2. Taller canes with sufficient buds
3. High summer fruit quality and yield

Potted raspberries used to quickly compare cultivars under high tunnels, Benton Harbor, MI

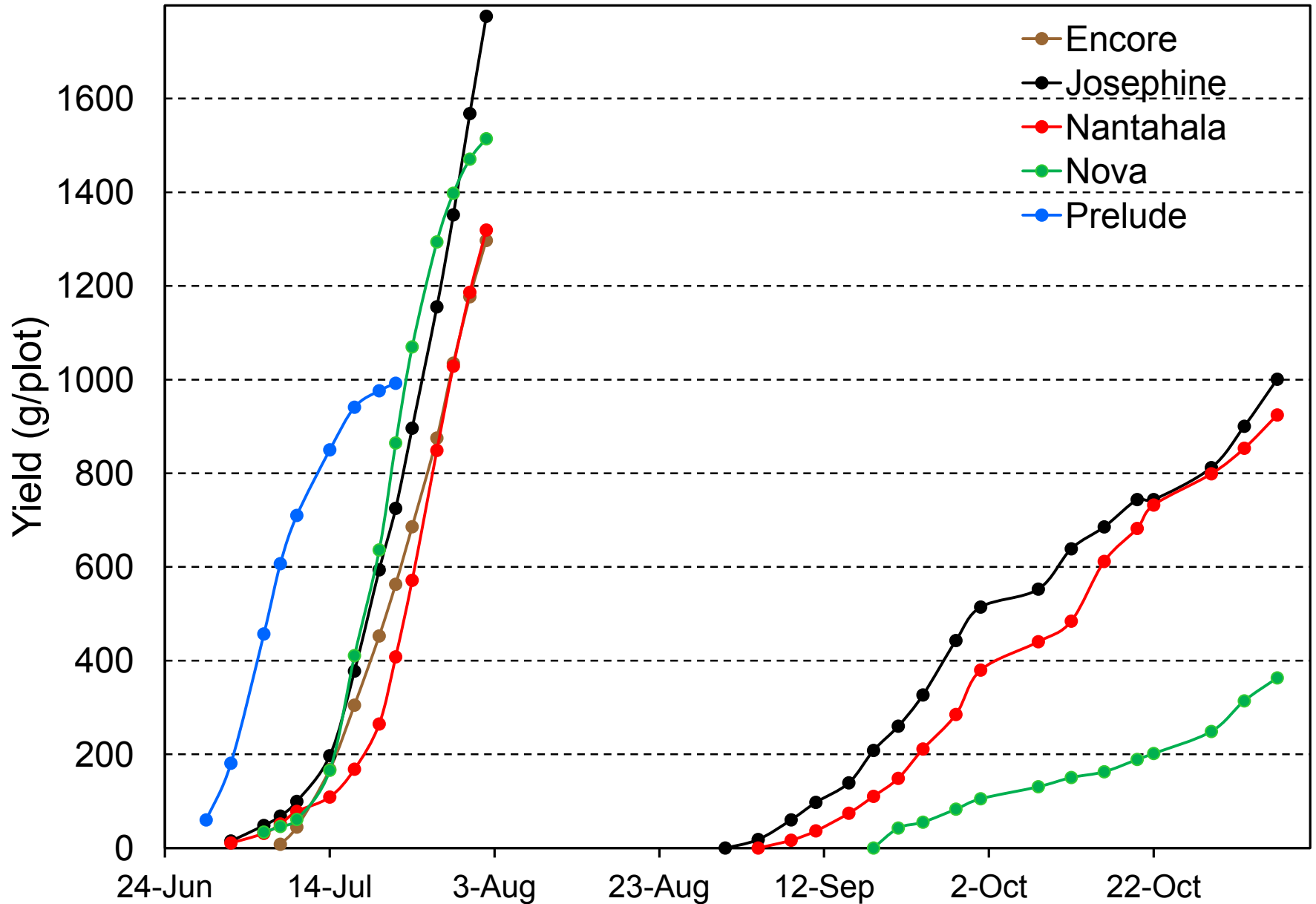
3-gallon grow bags, bark: peat (70:30) media
Drip irrigated with one 0.5 gph emitter per pot.
Fertigated continuously with 100 ppm N.



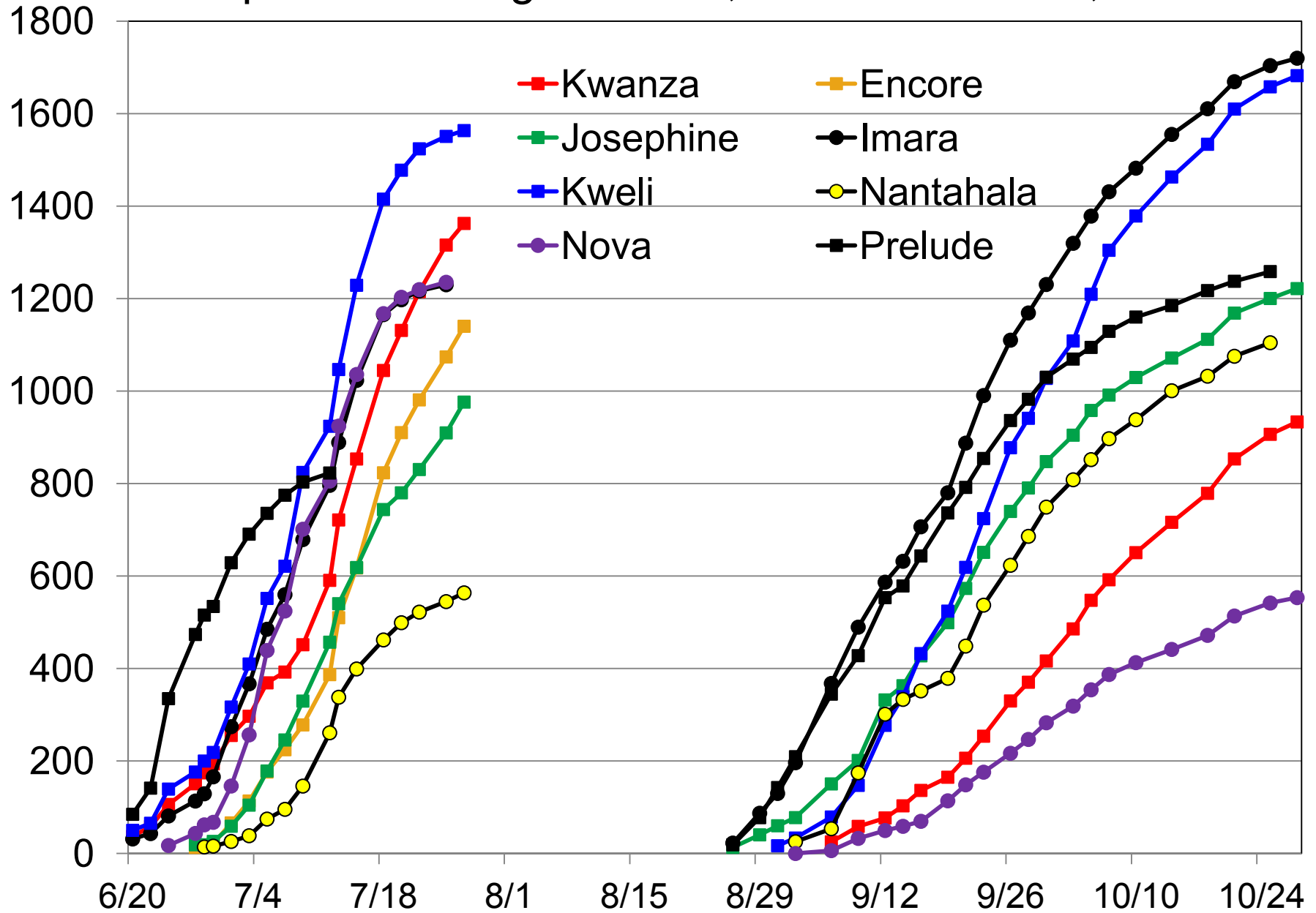
Yield (g/plant) of potted raspberry varieties pruned to retain 2 floricanes or none (2014), or only 2 floricanes (2015). Grown under high tunnels, Benton Harbor MI.

		2014		
Variety	Floricanes	Summer	Fall	Total
Josephine	yes	267	319	586
	no	0	798	798
Joan Irene	yes	438	545	983
	no	0	798	798
Crimson Giant	yes	387	311	698
	no	0	444	444
		2015		
Encore	yes	430	0	430
Josephine	yes	590	500	1090
Nantahala	yes	440	460	900
Nova	yes	500	190	690

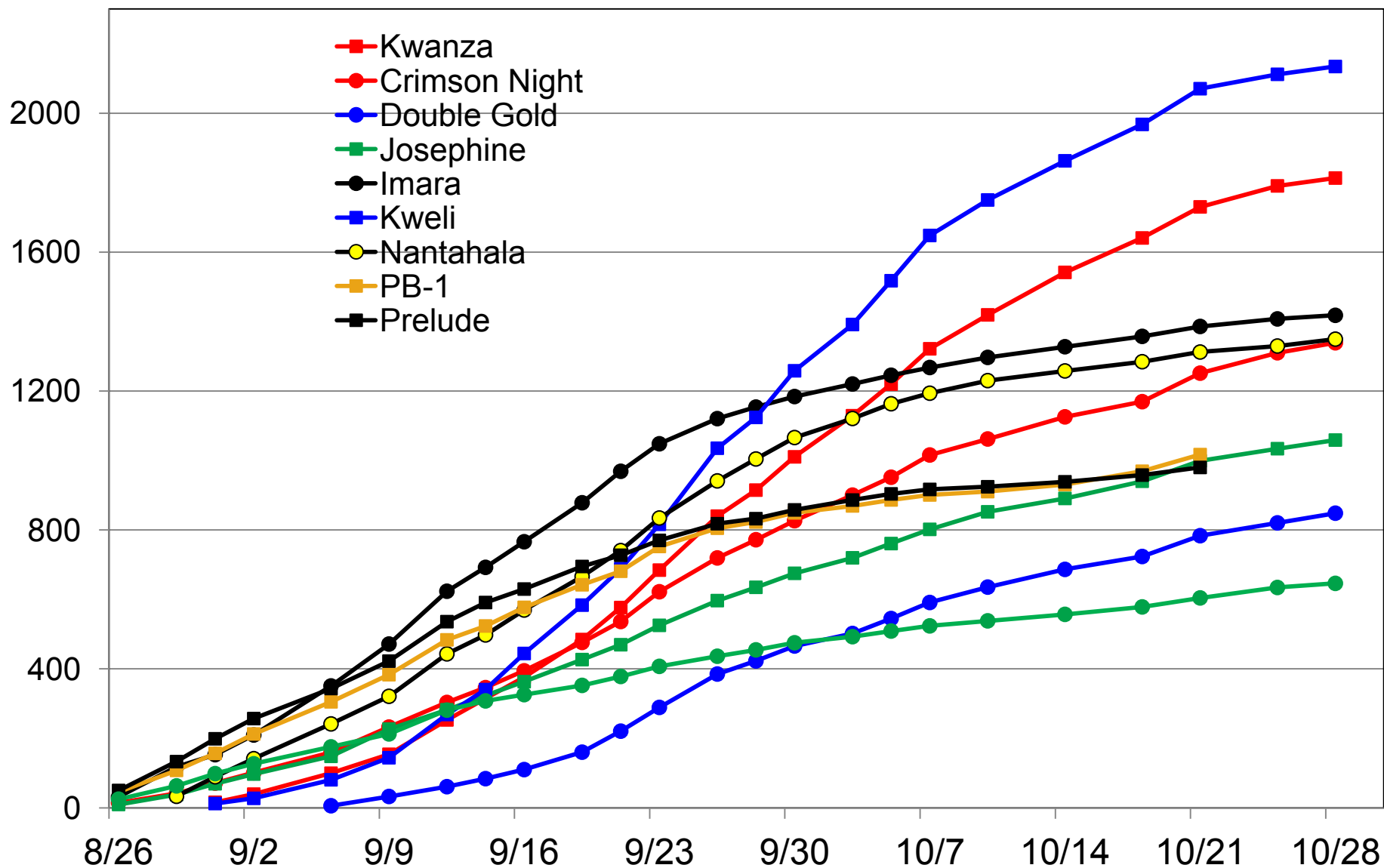
Cumulative summer and fall yield (g/plant) of potted raspberry cultivars under high tunnels in Benton Harbor, MI, 2015.



Cumulative florican and primocane yield (g/plant) of potted raspberries in high tunnels, southwest Mich., 2016



Cumulative primocane yield (g/plant) of potted raspberries in high tunnels, southwest Mich., 2016 (plants not fruited on floricanes)



Primocane fruit, SWMREC Sep 2016

Kwanza Crimson
 Night Double
 Gold Kweli Imara



Josephine Nantahala BP-1 Prelude Vintage

Effects of cultivar on **floricane** berry weight, appearance (1=unsalable to 5=excellent), and percentage of berries that were soft or leaky, or moldy, after 48 h at 18C. Berries were grown in pots under a tunnel in southwest Mich., 2016.

Variety	g/ berry	Appearance	% Leaky	% moldy
Double Gold	2.6	3.8	4.8	8.5
Encore	4.9	3.4	5.4	2.3
Imara	3.9	3.7	2.3	1.0
Josephine	4.1	3.4	3.4	1.0
Kweli	3.9	4.8	0.5	0.5
Kwanza	4.8	3.9	3.2	3.1
Nantahala	3.2	3.1	5.0	6.1
Nova	3.6	4.7	2.2	1.2
Prelude	4.3	3.4	3.6	1.0

Effects of cultivar on **primocane** berry weight, appearance (1=unsalable to 5=excellent), and percentage of berries that were soft or leaky, or moldy, after 48 h at 68°F. Berries were grown in pots under a high tunnel in southwest Mich., 2016.

Cultivar	g/berry	Appearance	% soft/leaky	% moldy
Crimson Night	2.4	3.6	10.9	5.9
Double Gold	2.7	3.7	11.4	2.8
Imara	2.7	3.6	4.1	4.3
Josephine	3.6	2.9	8.7	5.8
Kwanza	3.8	4.2	0.8	2.3
Kweli	3.4	4.4	3.7	1.6
Nantahala	3.0	2.0	16.4	20.8
PB-1	2.3	2.9	10.1	11.3
Prelude	2.4	2.9	13.4	6.5
Vintage	2.5	3.0	7.6	13.7

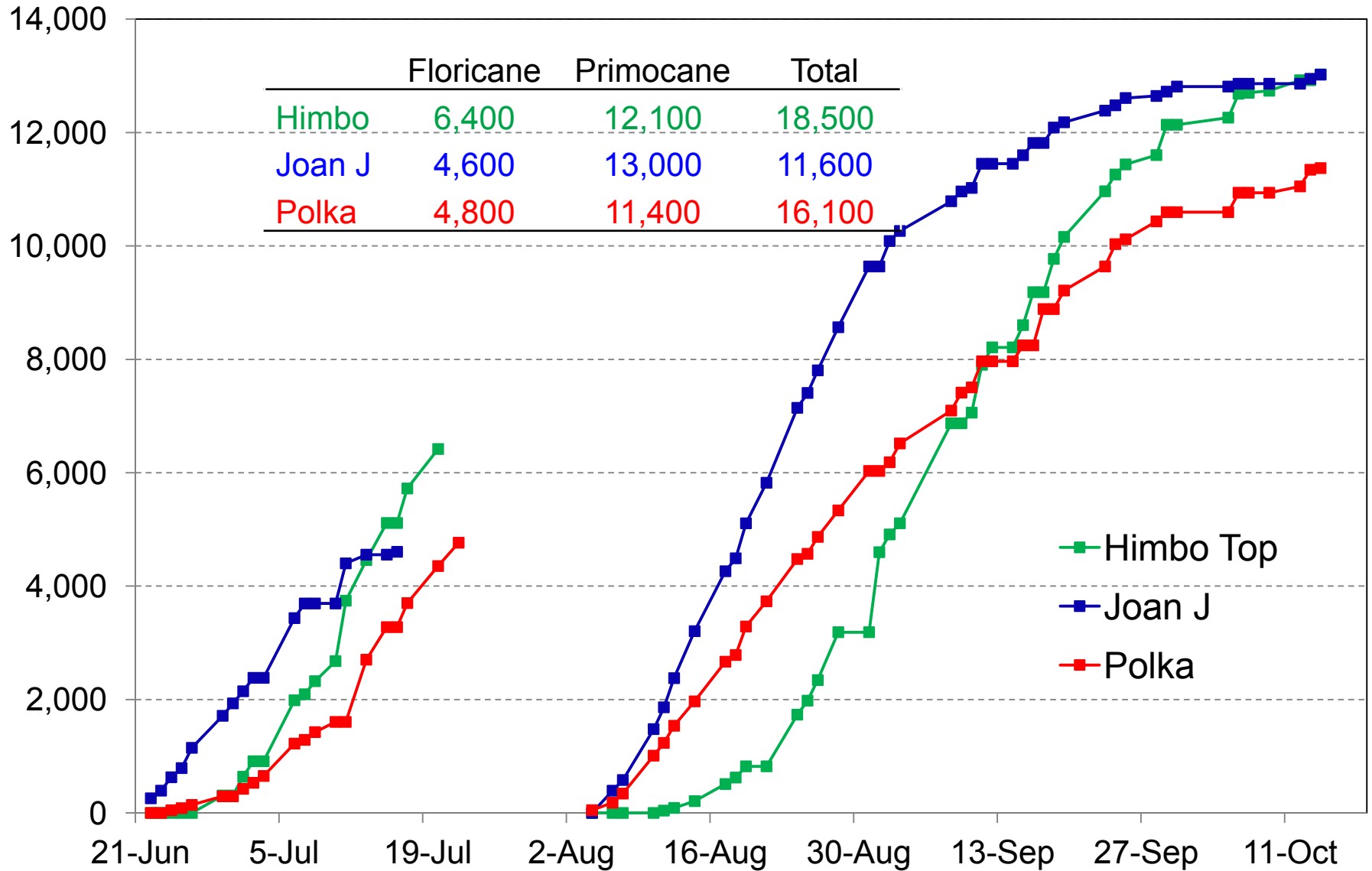
Double cropping studies, multiple bay tunnels, East Lansing, MI



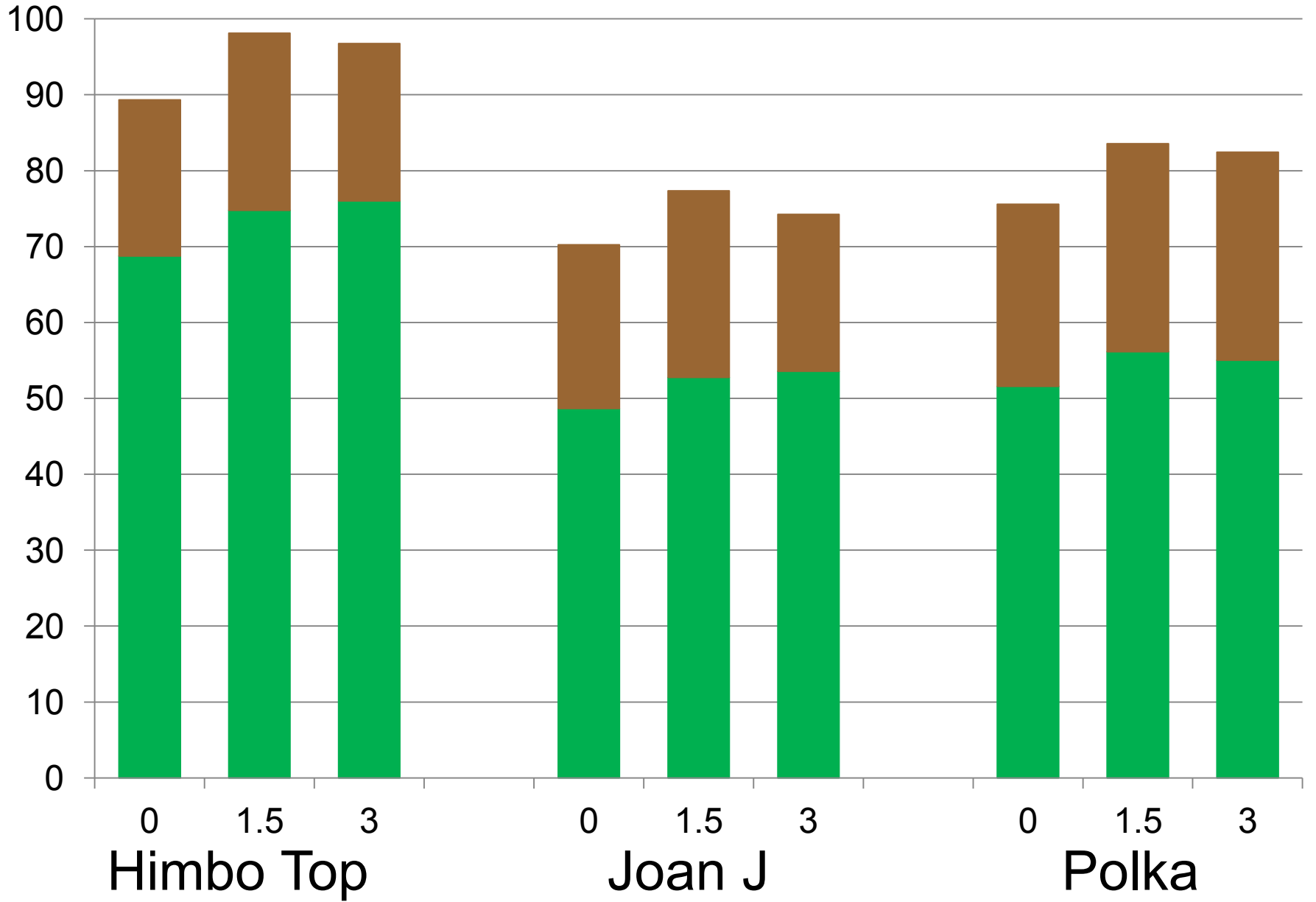
Effect of floricanes number retained on berry yields from floricanes (FL) and primocane (PR) of three raspberry cultivars in high tunnels, East Lansing, MI, 2015 and 2016.

Variety	2015				2016			
	Floricanes per ft of row	Yield (1000 lb/acre)			Floricanes per ft of row	Yield (1000 lb/acre)		
		FL	PR	Total		FL	PR	Total
Himbo	0	0	10.3	10.3	0	0	11.1	11.1
Himbo	0.7	3.6	13.0	16.6	1.5	6.7	10.5	17.2
Himbo	1.4	6.4	12.1	18.5	3.0	9.1	10.9	20.0
Joan J	0	0	11.2	11.2	0	0	8.7	8.7
Joan J	0.7	3.0	13.2	16.1	1.5	4.5	8.6	13.1
Joan J	1.2	4.6	13.0	17.6	3.0	6.3	8.2	14.5
Polka	0	0	9.1	9.1	0	0	7.9	7.9
Polka	0.7	2.9	11.5	14.4	1.5	6.5	7.6	14.1
Polka	1.3	4.8	11.4	16.1	3.0	9.4	6.6	16.0

Cumulative summer and fall yield (lb/acre) of three raspberry cultivars under high tunnels in East Lansing, MI, 2015.

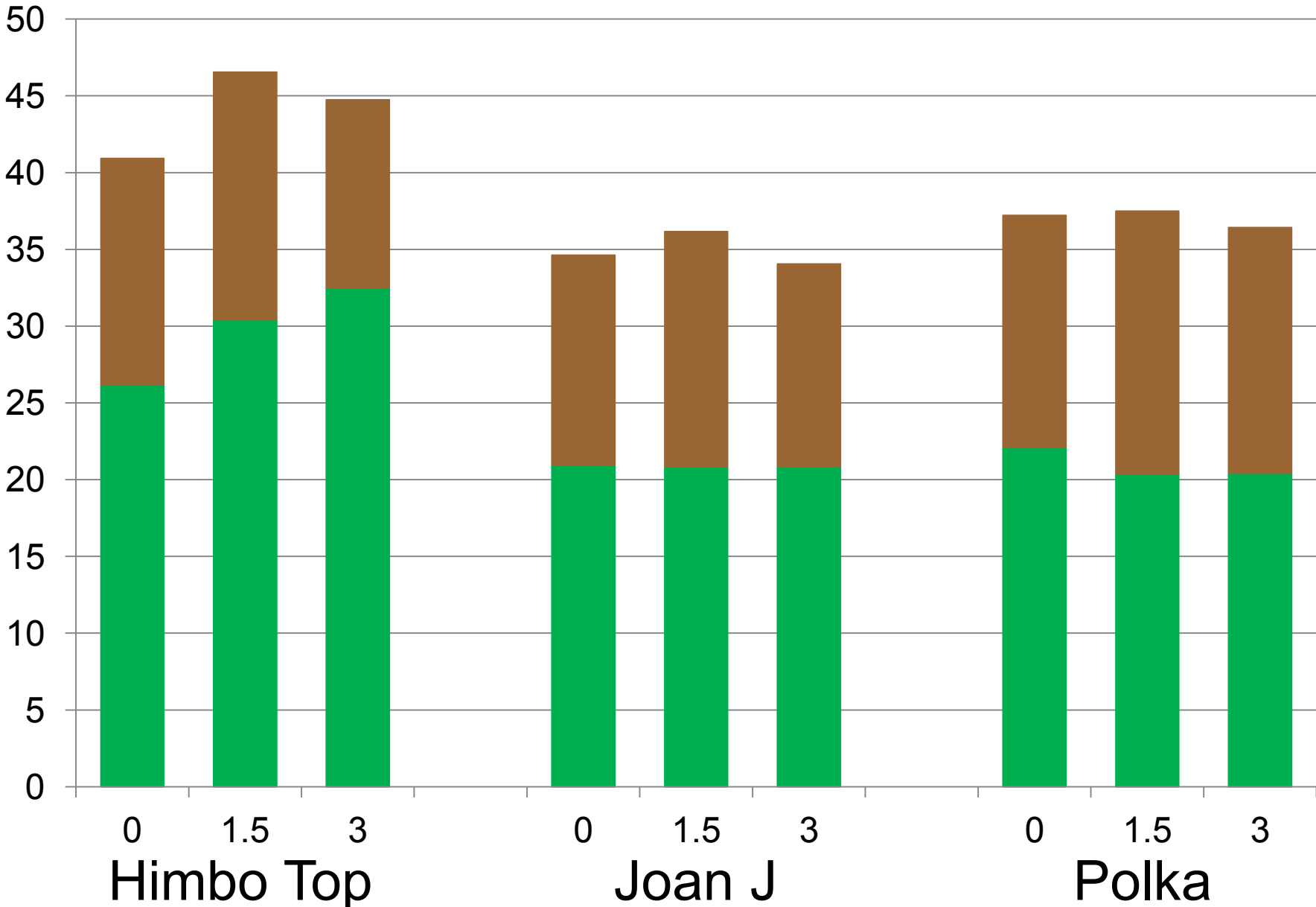


Primocane length (inches) that fruited in the fall (brown) or did not fruit (green), as affected by the number of floricanes retained per linear foot of row, 2016.





Nodes per primocane that fruited in the fall (brown) and did not fruit (green), as affected by the number of floricanes retained per linear foot of row, 2016.



Cost differences – primocane vs double cropping



Pruning, training and trellising -primocane cropping only

		Hr/acre	\$/acre
Place and secure wooden trellis post	May	7	84
Install 4 monofilament lines per row	May	6	72
Thin primocanes by narrowing rows	May-June	13	156
Clip primocanes to wire	July-Aug	54	648
Unclip primocanes, take down trellis	Oct-Nov	13	156
TOTALS		93	1116

Pruning, training and trellising - double cropping

		Hr/acre	\$/acre
Thin out unwanted floricanes	March	67	804
Remove cut floricanes from tunnel	March	3	36
Place and secure wooden trellis post	May	7	84
Install 4 monofilament lines per row	May	6	72
Thin primocanes by narrowing rows	May-June	13	156
Clip floricanes to wire	May	54	648
Unclip, cut and remove floricanes	July-Aug	54	648
Clip primocanes to wire	July-Aug	54	648
Unclip primocanes, take down trellis	Oct-Nov	13	156
TOTALS		271	3252

Potential Benefits of Double cropping

Extended marketing season and greater total yields.

Floricanes generally avoids SWD.

Risks/drawbacks of Double Cropping

Higher costs.

Winter cold injury to floricanes.

Accumulation of fungal pathogens over time.

SWD populations may begin to build earlier.

Thank you!

Resources:

High Tunnel Raspberry and Blackberry Production,
<http://www.fruit.cornell.edu/berry/production/pdfs/hightunnelsrasp2012>

www.tunnelberries.org



High Tunnel Raspberries and Blackberries



Costs and Returns: Excel files for in-ground conventional and organic tunnel raspberries, and potted tunnels raspberries (hansone@msu.edu).



Primocane length (inches) that fruited in the fall (brown) or did not fruit (green), as affected by the number of floricanes retained per linear foot of row, 2015.

