



## Fruit and Vegetable Production Data Collection

### Cooperators:

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- Melissa & Andy Dunham – Grinnell
- Tammy & Rob Faux – Tripoli
- Stacy & Rick Hartmann – Minburn
- Emma Johnson – Central City
- Susan Jutz – Solon
- Jan Libbey & Tim Landgraf – Kanawha

- Alice McGary & Nicolas Leete – Ames
- Mark Quee – West Branch
- Matt Russell & Patrick Standley – Lacona
- Ben Saunders – Granger
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- John & Jessica Wesselius – Sioux Center

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### Web Link:

[http://bit.ly/pfi\\_horticulture](http://bit.ly/pfi_horticulture)

### In a Nutshell

- **Thirteen farms participated** in fruit and vegetable production recordkeeping.
- The purpose of the project was to **create Iowa-specific production histories** for:
  - producers to have **baseline comparisons**,
  - the advancement of **crop insurance options**,
  - and to provide information about typical Iowa production **for lenders**.
- **Actual yields exceeded FSA-NAP yield estimates** for most crop categories.
- Data collection will continue in 2014.

Project Timeline:

February-December 2013



Project cooperators - left to right: Melissa and Andy Dunham, Tammy and Rob Faux, Mark Quee, and Jill Beebout.

### Background

Iowa-specific production histories do not exist for most Iowa fruit and vegetable crops. Fruit and vegetable farmers have expressed they would like these numbers to compare their planting, harvest and yields with locally-relevant baselines. Insurers and lenders also need this information to better serve fruit and vegetable producers.

Fruit and vegetable producers currently have insufficient crop insurance options. Private and public insuring agencies both say they need more Iowa-specific, actual production history to improve insurance options for these farmers.

To date, the only available risk management in Iowa for fruit and vegetables is Farm Service Agency's Non-Insured Crop Disaster Assistance Program (NAP). This program does not provide adequate risk management due to low number of allowable planting periods, high damage thresholds and low reimbursements based on Midwest wholesale prices. To the contrary, most Practical Farmers' producing fruits and vegetables sell into both retail and/or wholesale markets with higher revenue points.

Similarly, lenders need more information about fruit and vegetable production

potential to better assess the profit potential of these farms as well as assess the risk/benefit of lending to these farms.

### Method

Data was collected according to NAP standards — as it is the only crop insurance option available for fruit and vegetable producers. Melissa Dunham of Grinnell Heritage Farm created the data sheets to ensure uniform data collection. Prior to data collection FSA, private insurers and Risk Management Agency all reviewed the data collection sheets for the project. Thirteen farms participated in this project for the 2013 growing season. Farmers reported data for 23

FSA crop categories: apples, asparagus, beans, broccoli, cabbage, carrots, cauliflower, corn, cucumbers, eggplant, garlic, greens, herbs, lettuce, onions, peas, peppers, potatoes, sweet potatoes, shallots, squash, tomatoes, watermelon. Data represented 50 FSA type categories (sub-categories of crop categories). For example, onions tracked included types red, storage, sweet early, white and yellow hybrid. Summary data is included in this report. Full data is available at [http://bit.ly/pfi\\_horticulture](http://bit.ly/pfi_horticulture).

Total harvest includes insect- and producer-caused damaged crops (damage not due to natural disaster). Total acreage includes walking paths in production areas.

Additional data beyond FSA requirements collected to enhance producer comparisons included: variety name, plant spacing, irrigation, planting notes and harvest notes.

## Results and Discussion

Actual yields exceeded FSA-NAP yield estimates for all crop categories and sub-categories, except for one variety of onion and cabbage, and all varieties of potato (**Table 1**).

Production varied significantly across farms (**Tables 2 - 22**). These variances can be contributed to differences in production practices such as plant spacing and method, harvest methods, fertility practices, weed control, pest control, and environmental issues such as weather, soil health, weed pressure and pest pressure. If you are comparing yield between farms, please keep these and other variables in mind.

Actual production data presented here has been transformed to a per acre weighted average in order to provide standardized comparison with FSA-NAP. There are concerns with the validity of scaling up from, for example, 0.1 acres to 1 acre. This data serves as a baseline for on-going work; more samples from more farms across multiple years will increase the reliability of these numbers in the future.

Table 1		Actual production and FSA-NAP estimates			
Product	Variety	# of farms	Unit	PFI Yield	FSA-NAP (2012) Yield
<b>Apples</b>			<b>42# Cont</b>	<b>539</b>	<b>196</b>
	Common	1		514	196
	Specialty	1		676	196
<b>Asparagus</b>	Variety Not Stated	2	<b>Lbs</b>	<b>351</b>	n/a
<b>Beans</b>			<b>Cwt</b>	<b>108</b>	n/a
	Green	3		124	n/a
	Pole	1		119	n/a
	Snap Wax	1		48	n/a
<b>Broccoli</b>	Variety Not Stated	1	<b>Lbs</b>	<b>7985</b>	n/a
<b>Cabbage</b>			<b>100# Cont</b>	<b>33</b>	n/a
	Hybrid Cabbage	1		15	116
	Savoy	1		73	98
<b>Carrots</b>	Hybrid	5	<b>Cwt</b>	<b>323</b>	400
<b>Cauliflower</b>	Variety Not Stated	1	<b>Cwt</b>	<b>7</b>	n/a
<b>Corn</b>	Sweet	1	<b>8# Cont</b>	<b>849</b>	471/941
<b>Cucumbers</b>			<b>Cwt</b>	<b>321</b>	62/287
	Common-HT	1		463	n/a
	Common-OD	1		317	n/a
<b>Eggplant</b>	Oriental	1	<b>Cwt</b>	<b>291</b>	n/a
<b>Garlic</b>			<b>100# Cont</b>	<b>68</b>	n/a
	Seed garlic				n/a
	Common-scapes	2		3	n/a
	Common-whole	3		71	n/a
<b>Greens</b>			<b>Lbs</b>	<b>34270</b>	n/a
	Arugula	1		1200	n/a
	Common Kale	2		48456	n/a
	Red Swisschard	1		55697	n/a
<b>Herbs</b>			<b>Lbs</b>	<b>14765</b>	n/a
	Basil-HT	1		26293	n/a
	Basil-OD	1		9102	n/a
<b>Lettuce</b>			<b>Cwt</b>	<b>105</b>	n/a
	Crisphead	1		283	n/a
	Leaf Lettuce	1		94	n/a
	Romaine Lettuce	1		204	n/a
<b>Onions</b>			<b>Cwt</b>	<b>261</b>	n/a
	Reds	2		236	269
	Storage	3		226	n/a
	Sweet early	1		311	269
	Whites	1		427	269
	Yellow Hybrid	1		323	269
<b>Peas</b>			<b>Lbs</b>	<b>3934</b>	n/a
	Snap	1		5058	n/a
	Snow	1		2712	n/a
	Sugar	1		6734	3492

**Table 1 - cont.**

<b>Actual production and FSA-NAP estimates</b>					
<b>Peppers</b>			<b>Cwt</b>	<b>117</b>	n/a
	none	1		109	n/a
	Oriental Red	1		124	n/a
	Yellow	1		114	n/a
<b>Potatoes</b>			<b>Cwt</b>	<b>89</b>	n/a
	Fingerling	2		79	n/a
	Reds	4		89	308
	Russets	1		110	308
	Specialty	4		84	n/a
	Whites	4		110	308
	Yellow	4		87	308
<b>Sweet Potatoes</b>	Beauregard	3	<b>Cwt</b>	<b>143</b>	n/a
<b>Shallots</b>	Variety Not Stated	1	<b>Lbs</b>	<b>13250</b>	n/a
<b>Squash</b>			<b>Cwt</b>	<b>159</b>	n/a
	Acorn Squash	1		176	79
	Buttercup	1		95	n/a
	Butternut Squash	2		209	79
	Spaghetti Squash	1		146	97
	Summer Squash	1		263	97
	Winter Squash	1		89	79
	Zucchini Squash	1		236	97
<b>Tomatoes</b>			<b>Cwt</b>	<b>402</b>	n/a
	Hybrid	1		683	103/128
	none	1		303	n/a
	Yellow	1		151	n/a
<b>Watermelon</b>	Ice Box/ Sugar Babies	1	<b>Cwt</b>	<b>83</b>	n/a

Table 1: Actual production (presented as weighted averages) collected during this project and FSA-NAP Olympic averages. Olympic averages—five year history—are currently used to set the Transitional (T) yield for producers who do not have actual yields the first year of their NAP coverage. Olympic averages are five-year averages set by the State Committee from existing production data. These are only currently available for a limited number of crops. The information from this project will be included in setting Olympic averages for the 2015 growing season. Producers with NAP coverage should be providing production records to their local FSA Office so their Actual Production History (APH) for the crop can be properly updated. Where applicable FSA-NAP yield numbers include non-irrigated / irrigated production estimates where applicable. HT = high tunnel; OD = outdoor production. 42# Cont = number of 42 pound containers; Lbs = pounds; Cwt = hundredweight; 8# Cont = number of 8 pound containers; 100# Con = number of 100 pound containers.





**Table 2**

<b>Apple</b>	
<b>Producer number</b>	<b>P9003</b>
Location	outdoor
Direct or Transplant	transplant
Planting Date	4/2007
Mulch	none
Irrigation	no
Harvest Date Range	8/8 -10/20/2013
In-row Spacing (ft)	6
Between-row Spacing (ft)	16
<b>Sum of # Acres</b>	
Apple - All	0.85
Common	0.73
Specialty	0.13
<b>Per acre weighted average yield (pounds)</b>	
Apple - All	<b>22635</b>
Common	21590
Specialty	28404

**Table 3**

<b>Asparagus</b>			
<b>Producer number</b>	<b>P9006</b>	<b>P9010</b>	<b>Total</b>
Location	outdoor	outdoor	
Direct or Transplant	transplant	transplant	
Planting Date	6/15/99	5/3/11	
Mulch	none	none	
Irrigation	no	no	
Harvest Date Range	5/3-6/4/13	5/3-5/17/13	
In-row Spacing (in)	12.00	15.00	
Between-row Spacing (in)	48.00	48.00	
<b>Sum of # Acres</b>			
Asparagus -Variety Not Stated	0.200	0.870*	<b>1.070</b>
<b>Per acre weighted average yield (pounds)</b>			
Asparagus -Variety Not Stated	1610	61*	<b>351</b>

\*First year harvest from this planting



**Table 4**

<b>Beans</b>					
<b>Producer number</b>	<b>P9004</b>	<b>P9009</b>	<b>P9011</b>	<b>P9012</b>	<b>Total</b>
Location	outdoor	outdoor	outdoor	high tunnel	
Direct or Transplant	direct	direct	direct	direct	
Planting Date Range	5/14-6/4/13	7/14/13	6/12/13	6/7-7/4/13	
Mulch	none	none	none	none	
Irrigation	yes	yes	yes	yes	
Harvest Date Range	7/6-8/23/13	8/29-10/19/13	8/9-10/8/13	7/25-10/17/13	
In-row Spacing (in)	1.00	1.00	3.00	2.00	
Between-row Spacing (in)	24.00	60.00	70.00	10.00	
<b>Sum of # Acres</b>					
Beans - All	0.083	0.068	0.002	0.006	<b>0.159</b>
Green	0.083	0.034		0.006	<b>0.123</b>
Pole			0.002		<b>0.002</b>
Snap Wax		0.034			<b>0.034</b>
<b>Per acre weighted average yield (pounds)</b>					
Beans - All	11023	11663	11935	63246	<b>10777</b>
Green	11023	6904		63246	<b>12423</b>
Pole			11935		<b>11935</b>
Snap Wax		4759			<b>4759</b>

Table 5

Broccoli	
Producer number	P9012
Location	outdoor
Direct or Transplant	transplant
Planting Date	6/20/13
Mulch	none
Irrigation	no
Harvest Date Range	8/20-10/29/2013
In-row Spacing (in)	12
Between-row Spacing (in)	48
<b>Sum of # Acres</b>	
Broccoli	<b>0.064</b>
<b>Per acre weighted average yield (pounds)</b>	
Broccoli	<b>7985</b>

Table 6

Cabbage	
Producer number	P9013
Location	outdoor
Direct or Transplant	transplant
Planting Date	7/12/13
Mulch	none
Irrigation	no
Harvest Date Range	11/21/13
In-row Spacing (in)	12
Between-row Spacing (in)	24
<b>Sum of # Acres</b>	
Cabbage - All	<b>0.769</b>
Hybrid cabbage	0.528
Savoy	0.241
<b>Per acre weighted average yield (pounds)</b>	
Cabbage - All	<b>3316</b>
Hybrid cabbage	1515
Savoy	7260

Table 7

Carrots						
Producer number	P9004	P9005	P9009	P9012	P9013	Total
Location	outdoor	outdoor	outdoor	outdoor	outdoor	
Direct or Transplant	direct	direct	direct	direct	direct	
Planting Date Range	4/6-7/24/13	5/12-7/15/13	4/5-4/28/13	5/18/13	7/12/13	
Mulch	none	none	none	none	none	
Irrigation	yes	yes	yes	yes	yes	
Harvest Date Range	7/6-11/2/13	8/12-11/8/13	7/5-9/2/13	8/21-10/29/13	10/17-11/15/13	
In-row Spacing (in)	0.20	1.00 - 4.00	0.80	1.00	1.00	
Between-row Spacing (in)	4.00	15.00	8.00	2.00	2.70	
<b>Sum of # Acres</b>						
Carrots - Hybrid	0.103	0.175	0.038	0.014	0.574	<b>0.905</b>
<b>Per acre weighted average yield (pounds)</b>						
Carrots - Hybrid	41891	15110	38226	44438	35196	<b>32348</b>

Table 8

Cauliflower	
Producer number	P9006
Location	outdoor
Direct or Transplant	transplant
Planting Date	5/23/13
Mulch	none
Irrigation	no
Harvest Date Range	10/6/13
In-row Spacing (in)	24
Between-row Spacing (in)	24
<b>Sum of # Acres</b>	
Cauliflower	<b>0.060</b>
<b>Per acre weighted average yield (pounds)</b>	
Cauliflower	<b>650</b>

Table 9

Sweet Corn	
Producer number	P9008
Location	outdoor
Direct or Transplant	direct
Planting Date	5/24/13
Mulch	none
Irrigation	no
Harvest Date Range	8/7-8/28/13
Plant Population	28,000
<b>Sum of # Acres</b>	
Sweet Corn	<b>1</b>
<b>Per acre weighted average yield (pounds)</b>	
Sweet Corn	<b>6789</b>

**Table 10**

Garlic					
Producer number	P9001	P9002	P9006	P9011	Total
Location	outdoor	outdoor	outdoor	outdoor	
Direct or Transplant	transplant	direct	direct	direct	
Planting Date Range	9/28/12	10/30-11/5-12	10/25/13	10/14/12	
Mulch	straw	straw	straw	straw	
Irrigation	no	no	no	no	
Harvest Date Range	7/10-7/16/13	5/17-7/28/13	8/19/13	6/18/-7/5/13	
In-row Spacing (in)	4.00	4.00	6.00	10.00	
Between-row Spacing (in)	36.00	30.00	18.00	9.00	
Sum of # Acres					
Garlic - all	0.256	0.014	0.080	0.028	<b>0.364</b>
Seed				0.014	<b>0.014</b>
Common-scapes		0.006		0.014	<b>0.020</b>
Common-whole	0.256	0.008	0.080		<b>0.344</b>
Per acre weighted average yield (pounds)					
Garlic - all	8803	n/a	1763	n/a	<b>6771</b>
Seed				2449	<b>2449</b>
Common-scapes		470		251	<b>315</b>
Common-whole	8803	7770	1763		<b>7141</b>



**Table 11**

Greens				
Producer number	P9001	P9006	P9011	Total
Location	outdoor	outdoor	outdoor	
Direct or Transplant	transplant	direct	both	
Planting Date Range	4/28/13	5/18/13	4/13-4/30/13	
Mulch	none	none	none	
Irrigation	no	yes	yes	
Harvest Date Range	6/10-11/24/13	6/18-6/21/13	5/28-10/25/13	
In-row Spacing (in)	16.00	1.50	18.00	
Between-row Spacing (in)	36.00	14.00	14.00	
Sum of # Acres				
Greens - all	0.065	0.030	0.004	<b>0.099</b>
Arugula		0.030		<b>0.030</b>
Common Kale	0.065		0.002	<b>0.067</b>
Red Swisschard			0.002	<b>0.002</b>
Per acre weighted average yield (pounds)				
Greens - all	47335	1200	71514	<b>34270</b>
Arugula		1200		<b>1200</b>
Common Kale	47335		91616	<b>48456</b>
Red Swisschard			55697	<b>55697</b>

**Table 12**

Herbs	
Producer number	P9010
Location	high tunnel & outdoor
Direct or Transplant	transplant
Planting Date	6/05/13
Mulch	none
Irrigation	no
Harvest Date Range	9/03 - 10/18/13
In-row Spacing (in)	12
Between-row Spacing (in)	12
Sum of # Acres	
Herbs	<b>0.018</b>
Basil - Outdoor	0.006
Basil - High Tunnel	0.012
Per acre weighted average yield (pounds)	
Herbs	<b>14765.03</b>
Basil - Outdoor	26292.68
Basil - High Tunnel	9101.93



**Table 13**

<b>Lettuce</b>				
<b>Producer number</b>	<b>P9010</b>	<b>P9011</b>	<b>P9012</b>	<b>Total</b>
Location	high tunnel & outdoor	outdoor	high tunnel	
Direct or Transplant	direct	transplant	transplant	
Planting Date Range	3/26-4/28/13	4/27/13	4/5/13	
Mulch	none	none	none	
Irrigation	yes	yes	yes	
Harvest Date Range	5/3-7/5/13	6/4-6/21/13	5/10-6/3/13	
In-row Spacing (in)	broadcast	7.00	8.00	
Between-row Spacing (in)	broadcast	10.00	10.00	
<b>Sum of # Acres</b>				
Lettuce - all	0.033	0.001	0.002	<b>0.035</b>
Crisphead		0.001		<b>0.001</b>
Leaf Lettuce	0.033			<b>0.033</b>
Romaine Lettuce			0.002	<b>0.002</b>
<b>Per acre weighted average yield (pounds)</b>				
Lettuce - all	9404	28261	20376	<b>10474</b>
Crisphead		28261		<b>28261</b>
Leaf Lettuce	9404			<b>9404</b>
Romaine Lettuce			20376	<b>20376</b>

**Table 14**

<b>Onion</b>				
<b>Producer number</b>	<b>P9001</b>	<b>P9002</b>	<b>P9011</b>	<b>Total</b>
Location	outdoor	outdoor	outdoor	
Direct or Transplant	transplant	direct	transplant	
Planting Date Range	4/26/13	5/2/13	4/16-4/20/13	
Mulch	none	none	none	
Irrigation	no	yes	yes	
Harvest Date Range	8/6/13	8/16/13	7/2-7/27/13	
In-row Spacing (in)	3.00	5.00	5.50	
Between-row Spacing (in)	36.00	30.00	8.00	
<b>Sum of # Acres</b>				
Onions - all	0.089	0.005	0.005	<b>0.099</b>
Reds	0.030		0.000	<b>0.030</b>
Storage	0.030	0.005	0.003	<b>0.037</b>
Sweet early			0.002	<b>0.002</b>
Whites			0.001	<b>0.001</b>
Yellow Hybrid	0.030			<b>0.030</b>
<b>Per acre weighted average yield (pounds)</b>				
Onions - all	25875	15682	28401	<b>26067</b>
Reds	23595		29663	<b>23649</b>
Storage	21763	15682	42548	<b>22606</b>
Sweet early			31073	<b>31073</b>
Whites			42720	<b>42720</b>
Yellow Hybrid	32267			<b>32267</b>



**Table 15**

Peas			
Producer number	P9009	P9011	Total
Location	outdoor	outdoor	
Direct or Transplant	direct	direct	
Planting Date	4/05/13	4/13/13	
Mulch	none	none	
Irrigation	no	no	
Harvest Date Range	6/18 - 7/5/13	6/11- 6/28/13	
In-row Spacing (in)	1	2	
Between-row Spacing (in)	60	10	
Sum of # Acres			
Peas - All	0.104	0.002	<b>0.106</b>
Snap	0.052		<b>0.052</b>
Snow	0.052		<b>0.052</b>
Sugar		0.002	<b>0.002</b>
Per acre weighted average yield (pounds)			
Peas - All	3885	6734	<b>3934</b>
Snap	5058		<b>5058</b>
Snow	2712		<b>2712</b>
Sugar		6734	<b>6734</b>

**Table 16**

Pepper	
Producer number	P9004
Location	outdoor
Direct or Transplant	transplant
Planting Date	5/17/13
Mulch	none
Irrigation	yes
Harvest Date Range	7/29 - 9/26/13
In-row Spacing (in)	18
Between-row Spacing (in)	72
Sum of # Acres	
Peppers - All	<b>0.125</b>
none	0.019
Oriental Red	0.053
Yellow	0.053
Per acre weighted average yield (pounds)	
Peppers - All	<b>11744</b>
none	10864
Oriental Red	12418
Yellow	11387



**Table 17**

Sweet Potato				
Producer number	P9007	P9011	P9013	Total
Location	outdoor	outdoor	outdoor	
Direct or Transplant	transplant	transplant	transplant	
Planting Date	5/23/13	6/4/13	6/15/13	
Mulch	plastic	none	plastic	
Irrigation	yes	yes	yes	
Harvest Date Range	10/2-10/16/13	9/20-9/22/13	10/1-10/4/13	
In-row Spacing (in)	18.00	12.00	12.00	
Between-row Spacing (in)	72.00	48.00	60.00	
Sum of # Acres				
Potatoes, Sweet - Beauregard	0.145	0.005	0.359	<b>0.509</b>
Per acre weighted average yield (pounds)				
Potatoes, Sweet - Beauregard	21053	34954	11291	<b>14318</b>



**Table 18**

<b>Potato</b>								
<b>Producer number</b>	<b>P9002</b>	<b>P9003</b>	<b>P9004</b>	<b>P9005</b>	<b>P9009</b>	<b>P9011</b>	<b>P9012</b>	<b>Total</b>
Location	outdoor	outdoor	outdoor	outdoor	outdoor	outdoor	outdoor	
Direct or Transplant	direct	direct	direct	direct	direct	direct	direct	
Planting Date Range	5/14-6/8/13	4/28-4/29/13	4/6-4/30/13	5/15-5/25/13	4/30/13	4/13-5/8/13	5/16/13	
Mulch	straw	none	none	none	none	none	none	
Irrigation	yes & no	no	no	yes	no	no	no	
Harvest Date Range	9/2-11/10/13	6/13-9/13/13	7/6-10/10/13	8/5-10/25/13	9/16-10/15/13	7/9-7/26/13	10/21-10/27/13	
In-row Spacing (in)	12.00 - 18.00	10.00	12.00	12.00	12.00	9.70	12.00	
Between-row Spacing (in)	30.00 - 48.00	48.00	32.00	60.00	60.00	32.00	16.00	
<b>Sum of # Acres</b>								
Potatoes - all	0.019	1.401	0.359	0.819	0.066	0.016	0.037	<b>2.716</b>
Fingerling Potatoes	0.007		0.054					<b>0.062</b>
Reds		0.775	0.018	0.332		0.005		<b>1.130</b>
Russets							0.018	<b>0.018</b>
Specialty	0.011	0.151	0.017				0.018	<b>0.198</b>
Whites		0.059	0.083		0.066	0.005		<b>0.212</b>
Yellow		0.417	0.186	0.487		0.005		<b>1.095</b>
<b>Per acre weighted average yield (pounds)</b>								
Potatoes - all	10980	9395	15149	5081	8904	19966	11086	<b>8937</b>
Fingerling Potatoes	2450		8602					<b>7869</b>
Reds		9172	12337	7776		18790		<b>8856</b>
Russets							11042	<b>11042</b>
Specialty	16440	6848	13313				11130	<b>8370</b>
Whites		6273	15590		8904	18228		<b>11006</b>
Yellow		11171	17307	3240		22878		<b>8745</b>

**Table 19**

<b>Shallots</b>	
<b>Producer number</b>	<b>P9011</b>
Location	outdoor
Direct or Transplant	transplant
Planting Date	5/10/13
Mulch	none
Irrigation	yes
Harvest Date Range	7/27/13
In-row Spacing (in)	4
Between-row Spacing (in)	8
<b>Sum of # Acres</b>	
Shallots - variety not stated	<b>0.001</b>
<b>Per acre weighted average yield (pounds)</b>	
Shallots - variety not stated	<b>13250</b>

**Table 20**

<b>Watermelon</b>	
<b>Producer number</b>	<b>P9013</b>
Location	outdoor
Direct or Transplant	transplant
Planting Date	5/10/13
Mulch	none
Irrigation	yes
Harvest Date Range	8/19 - 9/4/13
In-row Spacing (in)	18
Between-row Spacing (in)	60
<b>Sum of # Acres</b>	
Watermelon - Ice Box / Sugar Babies	<b>0.492</b>
<b>Per acre weighted average yield (pounds)</b>	
Watermelon - Ice Box / Sugar Babies	<b>8259</b>

**Table 21**

**Squash**

Producer number	P9002	P9005	P9012	Total
Location	outdoor	outdoor	outdoor	
Direct or Transplant	direct	direct	transplant	
Planting Date Range	6/18/13	6/13-6/14/13	6/12/13	
Mulch	none	none	mixed	
Irrigation	no	yes	yes	
Harvest Date Range	10/8-10/14/13	9/23-10/16/13	7/11-10/8/13	
In-row Spacing (in)	18.00	54.00	12.00	
Between-row Spacing (in)	36.00	60.00	60.00	
Sum of # Acres				
Squash - all	0.006	0.325	0.078	<b>0.409</b>
Acorn Squash		0.047		<b>0.047</b>
Buttercup		0.037		<b>0.037</b>
Butternut Squash	0.006	0.085		<b>0.091</b>
Spaghetti Squash		0.029		<b>0.029</b>
Summer Squash			0.011	<b>0.011</b>
Winter Squash		0.127		<b>0.127</b>
Zucchini Squash			0.067	<b>0.067</b>
Per acre weighted average yield (pounds)				
Squash - all	33283	13636	23975	<b>15896</b>
Acorn Squash		17552		<b>17552</b>
Buttercup		9465		<b>9465</b>
Butternut Squash	33283	20046		<b>20945</b>
Spaghetti Squash		14566		<b>14566</b>
Summer Squash			14566	<b>26272</b>
Winter Squash		8909		<b>8909</b>
Zucchini Squash			23594	<b>23594</b>



Tim Landgraf and Jan Libbey of One Step at a Time Gardens.

**Table 22**

**Tomato**

Producer number	P9009	P9012	Total
Location	outdoor	outdoor	
Direct or Transplant	transplant	transplant	
Planting Date	5/18/13	6/14/13	
Mulch	plastic	straw	
Irrigation	yes	yes	
Harvest Date Range	7/29-10/7/13	8/6-10/19/13	
In-row Spacing (in)	30.00	24.00 - 28.00	
Between-row Spacing (in)	60.00	48.00	
Sum of # Acres			
Tomatoes - all	0.016	0.036	<b>0.052</b>
Hybrid	0.016		<b>0.016</b>
none		0.030	<b>0.030</b>
Yellow		0.006	<b>0.006</b>
Per acre weighted average yield (pounds)			
Tomatoes - all	68263	27825	<b>40203</b>
Hybrid	68263		<b>68263</b>
none		30330	<b>30330</b>
Yellow		15109	<b>15109</b>



Rick and Stacy Hartmann of Small Potatoes Farm.

**PFI Cooperators' Program**

PFI's Cooperators' Program gives farmers practical answers to questions they have about on-farm challenges through research, record-keeping, and demonstration projects. The Cooperators' Program began in 1987 with farmers looking to save money through more judicious use of inputs.