Title: Preparing and maintaining field trials for the XIth International Rubus and Ribes Symposium

Report

Grant Code: 2014-E-04

Name, Mailing and Email Address of Principal Investigator(s):

Principal Investigators: Dr. Gina E. Fernandez Department of Horticultural Science North Carolina State University Raleigh NC 27695 <u>Gina_Fernandez@ncsu.edu</u>

Objective:

The objective of this proposal was to prepare a series of field plantings will be a part of the XIth International Rubus and Ribes Symposium to be held in North Carolina in June 2015. This outreach proposal will enable us to highlight blackberry and raspberry production practices, cultivars and technologies used throughout the SEUS to a wide range of local, regional, national and international visitors.

Justification and Description

North Carolina State University Department of Horticultural Science will be hosting the XIth International Rubus and Ribes Symposium (XI IRRS) in 2015. The XI IRRS is scheduled for June 18-23, 2015 in Charlotte and Asheville, NC. This meeting is held every four years and is held under the auspices of the International Society of Horticultural Science (ISHS). This is the second time this event has been held in the US, the first time was in 1980 and the blackberry and raspberry industries in the southern US have grown significantly since that time. Gina Fernandez and Penelope Perkins-Veazie are Co-Conveners of this event. We are planning for 150-175 people to attend this symposium.

The symposium will include a 3-day preconference tour in and around the Charlotte, NC area. This area was chosen because of its proximity to the blackberry production area. We will be visiting NC growers (to be determined), the Plants for Human Health Institute, and the Piedmont Research Station (PRS), where part of the NCSU Caneberry breeding and cultural studies are conducted. In anticipation of this event, we are installing a series of trials at both grower locations and at the PRS. We are currently expanding existing trials and establishing new trials at the PRS in Salisbury NC, Upper Mountain Research and Extension Center in Mills River, and at the Biltmore Estate in Asheville NC. Additionally we are talking with growers in NC and SC for additional sites. Although some of the trials are part of the ongoing breeding program, we have added the number of plots and doubled the scope of trials beyond what we would have in a normal year, including the purchase of new plastic for tunnels, trellis posts, wire, plastic for raised beds and signage for the fields.

These trials included:

1. Around the World Variety Trial. 27 cultivars from 4+ countries at PRS.

2. High tunnel trial evaluation of advanced lines from NCSU and other breeding programs at PRS. (Tables 1-4).

3. Rotating Cross arm Trellis. Trellis rows in E-W and N-S orientation to compare white drupelet disorder in Von, Apache and Ouachita blackberries, at PRS. (Table 5 and 6).

- 4. Advanced selection trial at PRS. (Table 7 Black raspberries only).
- 5. Cultivar trial at Biltmore Estate.
- 6. Cultivar trial at Mountain Hort Crops Research and Extension Center.
- 7. On-farm cultivar trial at 1-2 farms in SC and NC to be determined.
- 8. Black raspberry and NC selection trials at Owls Den Farm.

We requested funds to help cover the cost of purchasing plants, establishing and maintaining these trials for the 2015 Symposium. Some trials were established in part or in whole in 2013. In 2014, we purchased additional plants and supplies to complete the trials. In 2015, we will be harvesting and making final field preparations.

Methodologies

Trial 1. Four new cultivars were purchased and planted in 2014.

Trial 2-5. Trials were already established, fields received standard training, pruning and fruit was harvested. Data will be used to illustrate yield potential of the different systems during the tour of the station in 2015.

Trial 6. Field was maintained by MHCREC. No harvest in 2014.

Trial 7. Four advanced selections from the NCSU raspberry breeding program were sent to both on farm locations. Only one location planted in tunnels, but did not take any yield data. The other location kept plants in pots. Agent Andy Rollins sent regular observations on their performance.

Trial 8. Trials are still in the field at this location. Plants were phenotyped one time in summer.

Data collection at most of the trials included travel to the sites 2 times each week. Fruit was harvested into clamshells, weighed and evaluated for a range of fruit attributes and is included at the end of this report (some plant and fruit ratings and post harvest data not shown).

On June 19, 2014, a Field Day was held at the Piedmont Research Station as a dry run for the 2015 Rubus Ribes Symposium.

(http://www.cals.ncsu.edu/agcomm/writing/Field_Days/SmallFruitFieldDay-Piedmont-061114.pdf). Tour stops included caneberry and other fruit crops.

Results/Conclusions

All of the trials listed above were established or maintained throughout the 2014 growing season. Trial 1, a non replicated was not harvested due to time constraints. But it is already becoming a useful illustration of adaptation of raspberries to NC (most non NC germplasm is struggling). Trials 2-5 were harvested in 2014 by our team. Yield data is included at the end of this report. The yield data will be compiled in a handout to illustrate production potential of the various trials and germplasm in NC at the ISHS symposium.

The field day helped us to determine the best tour route, timing for maximum fruit sampling and that we needed additional signage in 2015. Signs will be made in 2015 and placed in each of the above fields with information indicating that the SRSFC helped in funding these trials. The tour of the station will take place June 19 or 20 2015. We also determined that an early morning or afternoon tour would be best to minimize time spent outdoors, as many of the visitors will be from cooler climates.



Figure 1. Visitors sampling fruit during the 2014 Piedmont Research Station Small Fruit Field Day.

Impact Statement

Trials established at the Piedmont Research Station, Mountain Horticultural Crops Research and Extension Center, Biltmore Estate and one of the South Carolina on-farm locations will be part of the tours during the XIth International Rubus and Ribes Symposium. These trials will help to highlight the dynamic caneberry industry in the Southern Region of the U.S.

References NA

Tables

Table 1. High Tunnel Primocane Fruiting Raspberry Replicated Trial (2 reps, 5 plants each, 20ft plots) at Salisbury, NC in 2014.

Total yield, marketable yield , percent marketable yield and average berry weight							
	Total Yield (g/plant)	Marketable Yield (g/plant)	Percentage Marketable Yield (% of total)	Average berry weight (g)			
Crimson							
Giant	981	894	91	4.3			
Crimson							
Night	3185	2952	93	2.4			
Nantahala	2768	2523	91	3.3			
NC 666	1225	1144	93	2.8			
NC 669	2330	2200	94	3.1			
NC 712	1430	1245	87	3.2			
Polka	3559	3182	89	3.2			

Harvest dates at 5%, 50% and 95% yield

	5%	50%	95%
Crimson			
Giant	17-Jun	26-Aug	25-Sep
Crimson			
Night	24-Jul	20-Aug	11-Sep
Nantahala	30-Jun	29-Aug	16-Sep
NC 666	19-Jun	3-Jul	27-Jul
NC 669	25-Jun	29-Aug	19-Sep
NC 712	29-Jun	20-Jul	12-Sep
Polka	18-Jun	26-Jul	12-Sep

Table 2. High Tunnel Floricane Fruiting Raspberry Replicated Trial (2
reps, 5 plants each, 20ft plots) at Salisbury, NC in 2014.	

Total yield, marketable yield, percent marketable yield and average berry weight					
	Total Yield (g/plant)	Marketable Yield (g/plant)	Percentage Marketable Yield (% of total)	Average berry weight (g)	
Cascade					
Gold	6864	3657	53	4.2	
Latham	12868	12007	93	2.8	
NC 344	3501	2978	85	2.7	
NC 548	19532	16768	86	3.6	
NC 612	756	354	47	2.4	
Tulamagic	13187	12306	93	3.5	
Tulameen	4660	4094	88	3.1	

Total yield, marketable yield, percent marketable yield and average berry weig	ght
--	-----

That vest unles all 3.70 . 30.70 and 3.370 viet	Harvest	dates	at 5%.	50%	and	95%	vield
---	---------	-------	--------	-----	-----	-----	-------

5%	50%	95%				
9-Jun	18-Jun	30-Jun				
14-Jun	25-Jun	9-Jul				
2-Jun	13-Jun	2-Jul				
18-Jun	5-Jul	20-Jul				
6-Jun	21-Jun	4-Jul				
13-Jun	26-Jun	10-Jul				
12-Jun	26-Jun	9-Jul				
	5% 9-Jun 14-Jun 2-Jun 18-Jun 6-Jun 13-Jun 12-Jun	5% 50% 9-Jun 18-Jun 14-Jun 25-Jun 2-Jun 13-Jun 18-Jun 5-Jul 6-Jun 21-Jun 13-Jun 26-Jun 12-Jun 26-Jun				

Table 3. High Tunnel Floricane Fruiting Blackberry Replicated Trial (2reps, 5 plants each, 20ft plots) at Salisbury, NC in 2014

Total yield, marketable yield, percent marketable yield and average berry weight						
	Total Yield (g/plant)	Marketable Yield (g/plant)	Percentage Marketable Yield (% of total)	Average berry weight (g)		
Black						
Diamond	675	399	59	4.5		
Marion berry	1258	1159	92	5.0		
Natchez	9197	8507	92	9.7		
Navaho	2900	2827	97	6.7		
Osage	9044	8425	93	6.5		
Ouachita	5230	4944	95	7.6		
Prime Ark						
45	242	232	96	n/a		
Von	4733	4390	93	7.1		

 Table 4. High Tunnel Floricane Fruiting Blackberry Replicated Trial (2

 reps, 5 plants each, 20ft plots) at Salisbury, NC in 2014 (continued)

	5%	50%	95%
Black			
Diamond	2-Jun	11-Jun	25-Jun
Marion berry	8-Jun	18-Jun	25-Jun
Natchez	9-Jun	17-Jun	28-Jun
Navaho	14-Jun	23-Jun	29-Jun
Osage	11-Jun	21-Jun	11-Jul
Ouachita	15-Jun	24-Jun	30-Jun
Prime Ark			
45	22-Aug	n/a	n/a
Von	20-Jun	28-Jun	13-Jul

Harvest dates at 5%, 50% and 95% Yield

Table 5. RCA Shift Trellis Floricane Fruiting Blackberry Trial (single plot per row 3 plant plots on 4 ft. spacing, 4 rows, each facing one direction) at Salisbury, NC in 2014

East facing total yield, marketable yield , percent marketable yield and average berry weight

	Total Yield (g/plant)	Marketable Yield (g/plant)	Percentage Marketable Yield (% of total)	Average berry weight (g)
Apache	4949	4643	94	6.2
Ouachita	6309	5970	95	6.0
Von	4751	4222	89	6.5

West facing total yield, marketable yield , percent marketable yield and average berry weight

	Total Yield (g/plant)	Marketable Yield (g/plant)	Percentage Marketable Yield (% of total)	Average berry weight (g)
Apache	4188	3829	91	5.2
Ouachita	4339	4022	93	7.0
Von	3156	2947	93	6.3

Table 6. RCA Shift Trellis Floricane Fruiting Blackberry Trial (single plot per row 3 plant plots on 4 ft. spacing, 4 rows, each facing one direction) at Salisbury, NC in 2014 (continued)

	Total Yield (g/plant)	Marketable Yield (g/plant)	Percentage Marketable Yield (% of total)	Average berry weight (g)
Apache	4686	4276	91	7.3
Ouachita	2309	2002	87	5.2
Von	4100	3827	93	5.6

South facing total yield, marketable yield, percent marketable yield and average berry weight

North facing total yield, marketable yield , percent marketable yield and average berry weight

	Total Yield (g/plant)	Marketable Yield (g/plant)	Percentage Marketable Yield (% of total)	Average berry weight (g)
Apache	1957	1691	86	6.4
Ouachita	7357	6968	95	6.7
Von	4961	4589	93	5.9

Average across cultivars total yield, marketable yield , percent marketable yield and average berry weight by fruit load facing direction

	Total Yield (g/plant)	Marketable Yield (g/plant)	Percentage Marketable Yield (% of total)	Average berry weight (g)
East				
Facing	5336	4945	92	6.2
West				
Facing	3894.4	3599.1	92.5	6.2
South				
Facing	3698.3	3368.0	90.4	6.0
North				
Facing	4758	4416	91	6.3

-

Table 7. Black Raspberry Replicated Trial (2 reps, 5 plants each, 20ft plots) at Salisbury, NC in 2014

	Total Yield (g/plant)	Marketable Yield (g/plant)	Percentage Marketable Yield (% of total)	Average berry weight (g)
Jewel	3653	3413	93	2.8
Mac				
Black	1252	1210	97	2.0
NC 348	1146	1061	93	1.9
NC 349	3176	2934	92	1.8

Total yield, marketable yield , percent marketable yield and average berry weight

Harvest dates at 5%, 50% and 95% yield

		2	
	5%	50%	95%
Jewel	9-Jun	14-Jun	23-Jun
Mac			
Black	13-Jun	21-Jun	29-Jun
NC 348	2-Jun	12-Jun	22-Jun
NC 349	3-Jun	11-Jun	22-Jun