Evaluation of a new trellis system for blackberry production

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Introduction

- Trellising systems are used by commercial producers to provide support to the canes and fruits and to prevent damage from high winds.
- "V-" or "T-trellis" systems comprised of two opposing lower wires at 3 feet above ground and two parallel upper wires at 5 feet and slightly wider separation.
- In late winter the plants are pruned back leaving four to six canes trained to the outer trellis wires and the middle of the plant open for new primocane growth. Floricane lateral growth is trimmed back to 18 inches for fruit production and new primocanes are tipped at 30 to 40 inches to encourage lateral growth.
- Plant canopy can become dense and harvesting the fruit can be a challenge as some are concealed inside the middle between the trellis wires.
- A modified "cordon" trellis system will be compared to the conventional system to determine its influence on fruit yield and composition.
- The cordon system will use 2 to 4 canes, each pruned to the height of one trellis wire allowing two laterals per cane to extend horizontally along the wire in both directions.

Objective

To evaluate fruit quality and yield in a new trellis system suitable for small-sized farms.

Hypothesis

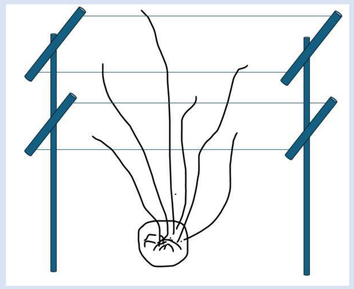
- Fewer canes in the cordon system will allow increased sunlight through the plant canopy and greater air movement resulting in decreased disease and insect pressure.
- The fruit weight is distributed on the trellis wires and facilitates a more efficient harvest, ultimately leading to premium quality berries.

Method

- Cultivar: 'Prime-Ark® Traveler', planted in 2016 at the Hampton Roads Agricultural Research Center. Six replicates with three plants each were randomized for each of the two trellising systems.
- Plants were pruned in early March 2023 and maintained throughout the growing season according to grower standard recommendations. New primocanes were tipped in the conventional system or trimmed and trellised to the two parallel upper and lower-wires for the modified "cordon" method.
- Fruits were harvested twice weekly beginning May 30 through the end of August (a double cropping system). Yield data were recorded as marketable grade 1 or grade 2, and nonmarketable white drupelet disorder (WDD), insects, diseases or "other" damage.
- Fruit size was determined by weighing 10 fruits/replicate and further analyzed for firmness, Total soluble solids (°Bx) and pH.
- Statistical analysis was done with two-sample t-test at alpha =0.05.

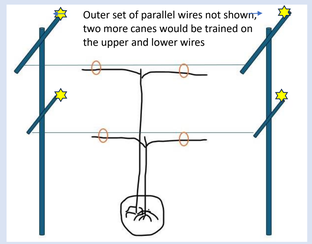
Conventional T-trellis:

Late winter (March) floricanes



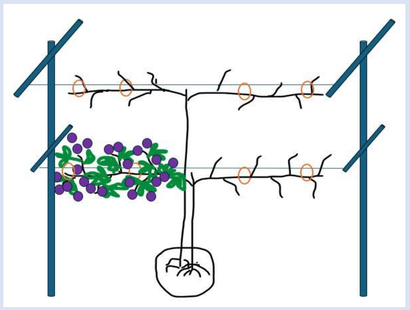
May 25 2023 growth

Cordon pruning method:



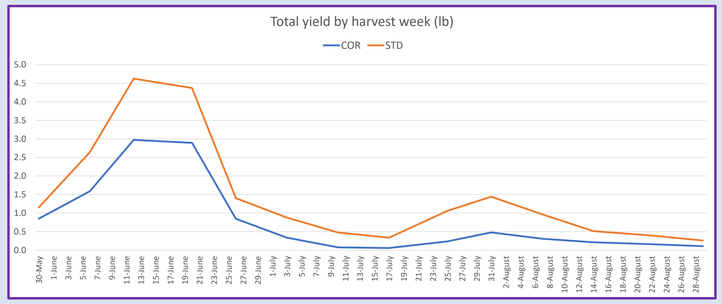
March 2023 floricanes

Trained lateral growth for fruit production



May 25 2023 growth

Results



- Standard trellis system had an overall higher total yield (P=0.0048), marketable yield, and non-marketable yield.
- No differences in TSS, pH or firmness were observed.
- Slightly smaller fruit size was observed in modified cordon system (P=0.01).

Yield (lb/plant)

	Total	Grade 1 MKT	Grade 2 MKT	Non-MKT
Cordon	4.75	1.57	1.20	1.98
Standard	7.70	2.38	1.97	3.35

Fruit quality

	Size (g)	TSS	pH	Firmness
Cordon	6.24	10.2	3.4	0.11
Standard	6.82	10.1	3.4	0.11

Challenges

- Primocane fruiting cultivar: new primocanes fruit then die back before next season.
- Diseases and disorders observed in the study: orange rust, low incidence of botrytis, WDD.
- Insect Pests- Japanese beetles (*Popillia japonica)*, Green June bugs (*Cotinis nitida*) and low incidence of spotted wing drosophila (*Drosophila Suzuki)*.
- Birds.
- Pruning was more labor-intensive for the cordon system.

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