

# Recommendations for Reducing Labor and Maximizing Yield on the Rotating Cross Arm Trellis

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# Meet our RCA Research Team



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 Horticulture Specialist

# History of Moveable Trellising

- Herb Stiles, Virginia Tech
- Fumi Takeda, USDA

# Overview of Research Trials



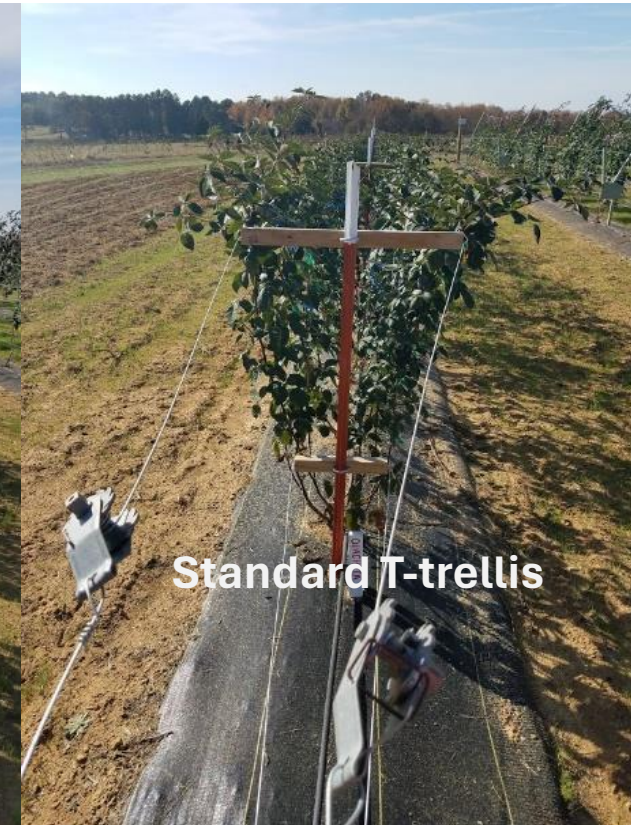
Arkansas Dept of Agriculture,  
Specialty Crop Block Grants





# Overview of Research Trials

- 3x 90' rows of rotating cross-arm (RCA) trellis (5' plant spacing)
  - 1x 90' row of t-trellis (2.5' plant spacing)
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- ✓ 2018, First harvest (McWhirt, et al 2019)
  - ✓ 2019-2020, Comparison of standard practices (MS Erika Henderson)
  - 2020-2022, Improving labor efficiency and SWD Management
  - 2020-2023, Testing spray coverage (Lead A. Cato)
  - 2023-Present, Verifying New Training Methods and new cultivars (**New planting**)



# Data collection

- Yield
- Fruit quality
- Cane characteristics
- Pest pressure
- Labor



Economic analysis



**McWhirt, A.,** Lee, J., Threlfall, R. and T. Ernst. 2019. Effects of Rotating Arm Trellising on First Year Blackberry Yields, Fruit Quality and Pest Pressure. *Acta Hort.* 1277, 215-224.



# Impact of trellising on yield

- Average Yields **per linear row foot** over time

	Marketable yield ( <u>lb</u> ) per m of row	
	RCA	T-Trellis
2018	6.3	8.2
2019	10.6	10.4
2020	5.5	8.9
2021	2.8	2.09
2022	10.0	6.9











# Labor

2018 TOTAL HOURS:	RCA		T-Trellis	
		Minutes per 100 linear feet		Minutes per 100 linear feet
Cane Training		2,751		1,411
Maintanace		524		-
<i>Irrigation, spraying, etc</i>		-		
Harvest		1,643		3,263
Frost protection		433		
<b>Total (minutes)</b>		<b>5,351</b>		<b>4,674</b>
Total (hours)		89		78

*Estimated 11 more hours per 100 linear feet to manage the RCA*

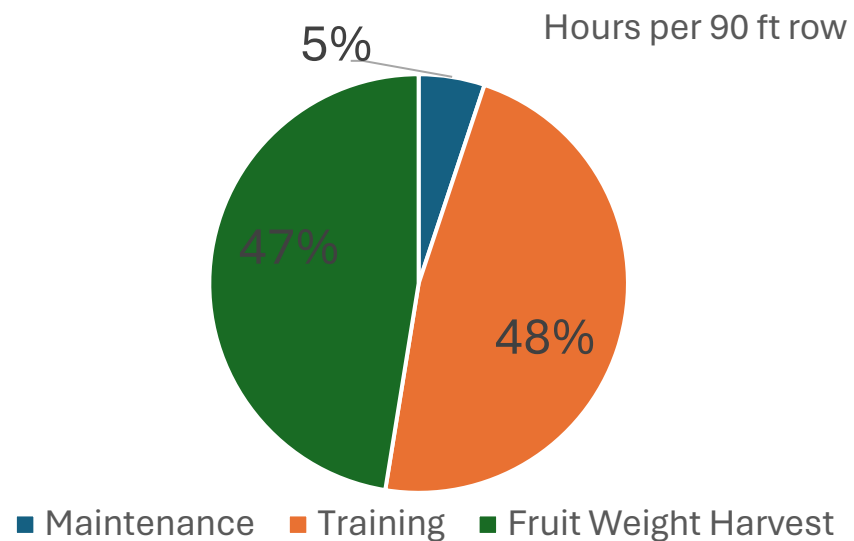
*Estimated 44 more hours per acre*

*\*Based off of 21 rows each 200 feet long*

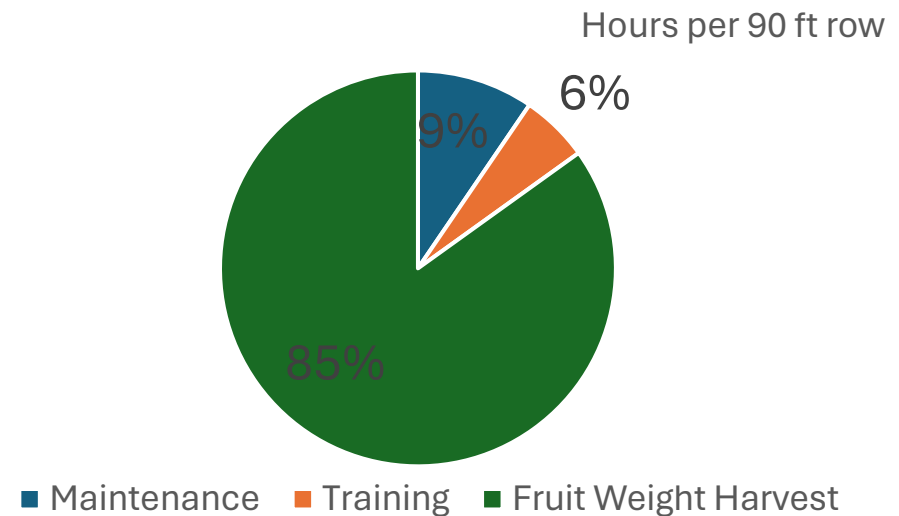


# 2019 Distribution of Labor Hours

## RCA Trellis



## Standard Trellis



*More time training, less time harvesting on the RCA...*



# Grower Experiences from 2021: After -20

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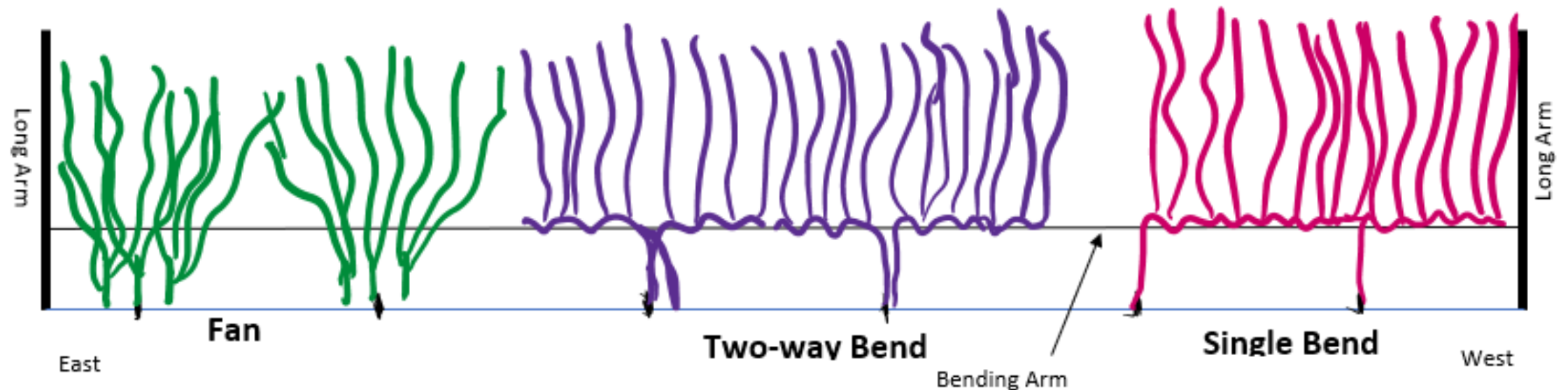


# Key Results from RCA Trials 2018-2021

- + Fewer SWD
  - + Reduction in key fruit disorders, and improved post-harvest
  - + Faster picking, Pick-your-own marketing tool
  - + Grower fields: Crops saved in 2020 (spring freeze) and 2021 (winter injury and spring freeze)
- 
- Higher labor to train
  - Cane fill on trellis = yield

# RCA: Optimizing the System

*Developing and testing new training methods 2021-Present*



Tip primocanes 8-10" high  
Leave 3-6 primocanes  
Fan laterals to cover entire trellis area

Tip bent primocanes at 2.5'  
Train Laterals like the control

*Image: Taunya Ernst*

**Control-** Train as normal



# Preliminary results

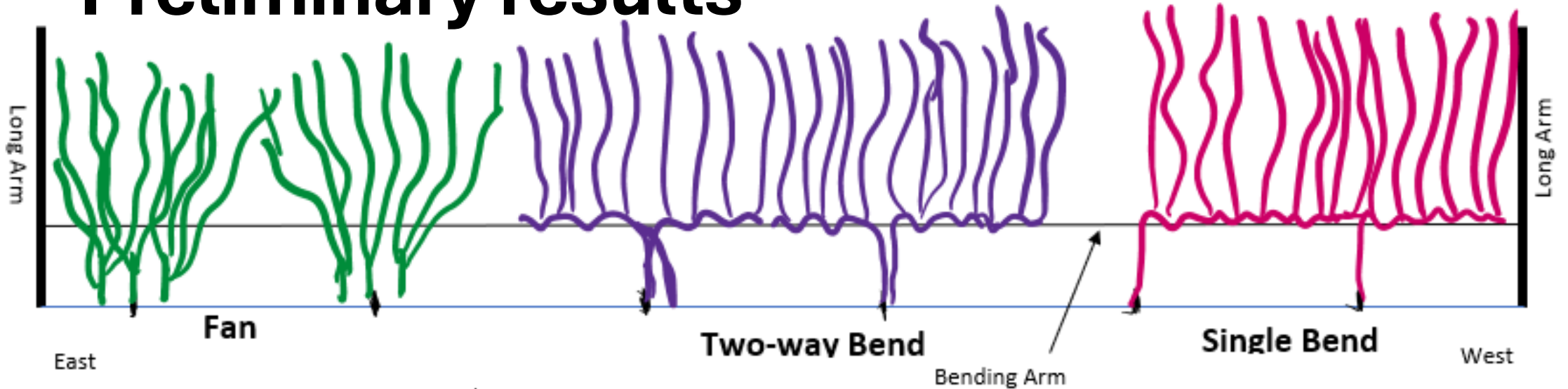


Image: Taunya Ernst

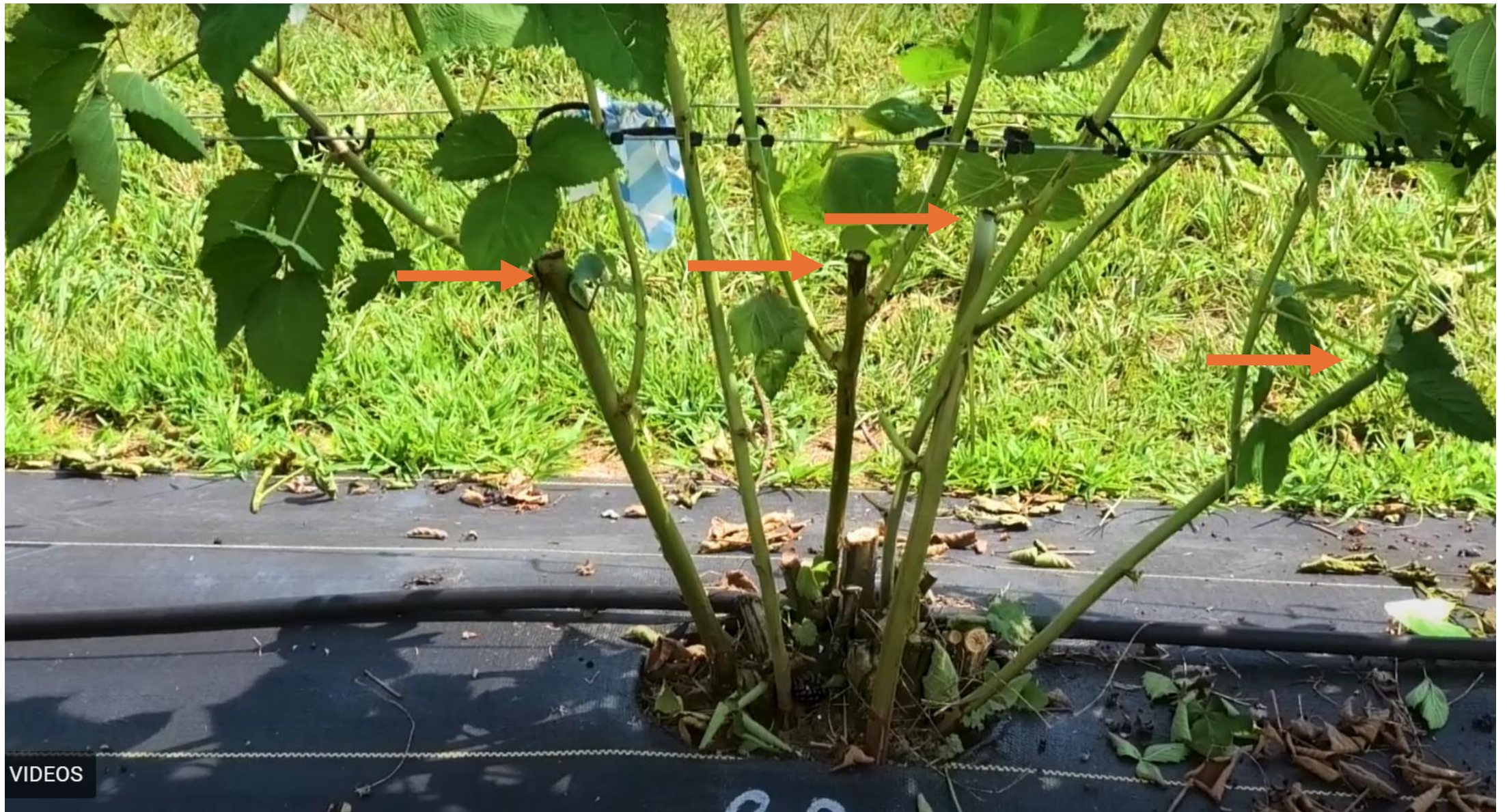
- Labor Reduced **32%**
- Timing cut back **late May/early June for AR**
  - **Yield similar to single bend in 2022**
- **Do not cut back to the ground- cut just below the bottom training wire**
- **Less cane cracking observed**
- Closer plant spacing (3')

- Labor increased **20%**











# Grower Fields: Examples of Fan Method









# Grower Fields: Examples of Fan Method



- Tipping timing is important! Don't miss your window
- Make sure you are doing a good job with fertility and irrigation
- Training pruning crew in new method is key



# Recommendations

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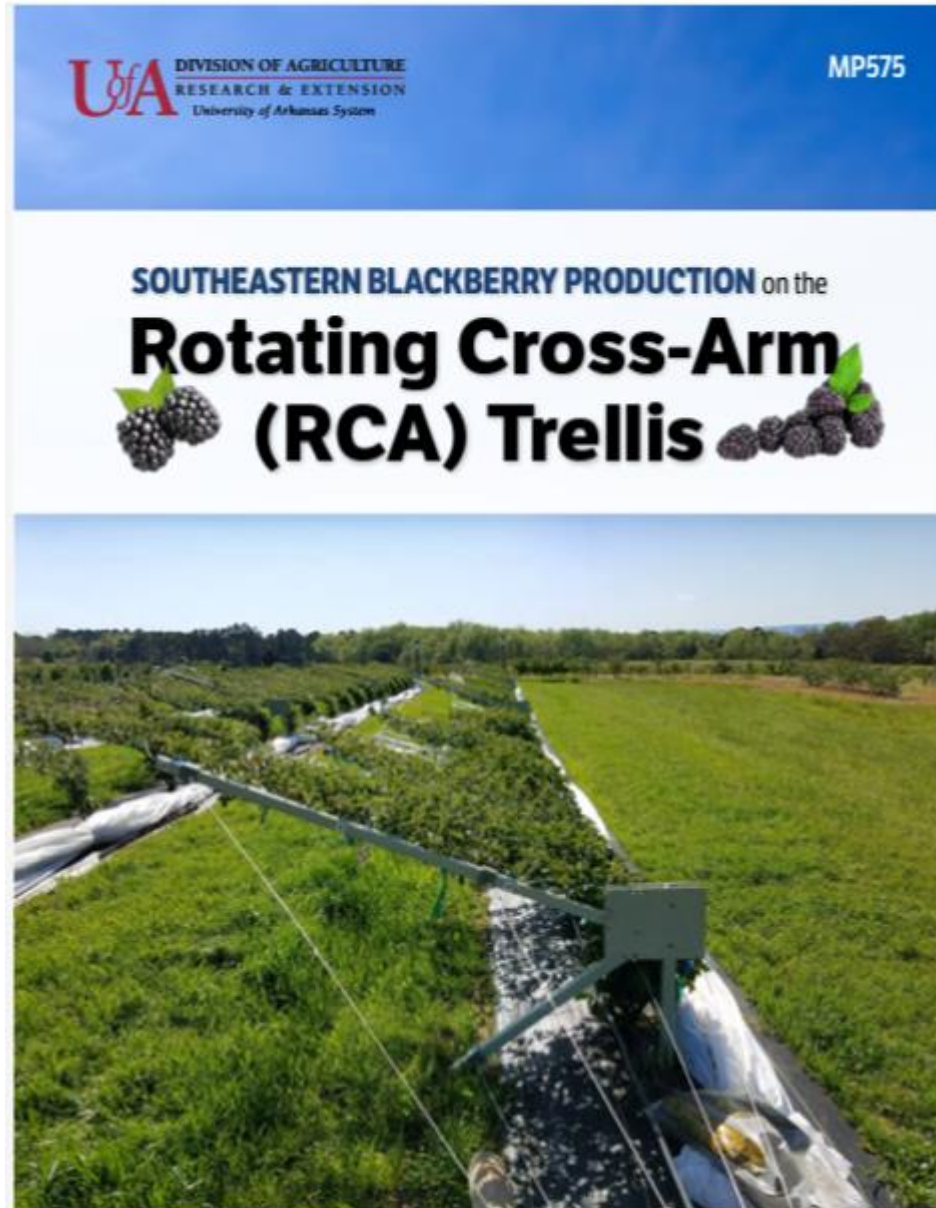
- **Recommendation: RCA has a place in blackberry production but cost vs benefit should be weighed for each farm.**
  - **Decrease plant spacing on RCA.**
- *Growers have started adopting the 'fan' method starting in 2020 and seeing very good results, we exclusively recommend this method now to new growers.*

Thanks  
for  
project  
support:



# Resources

<https://www.uaex.uada.edu/rca-trellis-blackberry>



## Tips on RCA Trellis Construction

- Tie-back posts should be placed at the beginning and end of each row. These should be sturdy and capable of supporting a significant amount of weight. A 5 inch diameter or greater fence post is a good option. Whatever material is selected, the posts should be buried no less than 48 inches in the ground with no less than 30 inches of the post above ground.
- End frame and center frame posts should be offset from the row center by 4 inches. The offset direction will depend on the orientation of the rows. For example, for rows with an east-to-west orientation posts should be offset 4 inches to the north.
- End frame posts should be no less than 72 inches from the tie-back posts.
- Add turnbuckles on trellising wires in-between the tie-back post and end frame posts for easy tightening of the wire.
- Trellis posts should be buried at least 20 inches below ground for adequate stability.
- A maximum distance of 30 feet between trellis posts.
- Do not overtighten the training wires. If over tightened the end trellis arms will begin to twist and bend toward each other, and side plates could crack.
- Visit the University of Arkansas' Fruit and Vegetable Program website for an [introduction video on trellis installation](#).

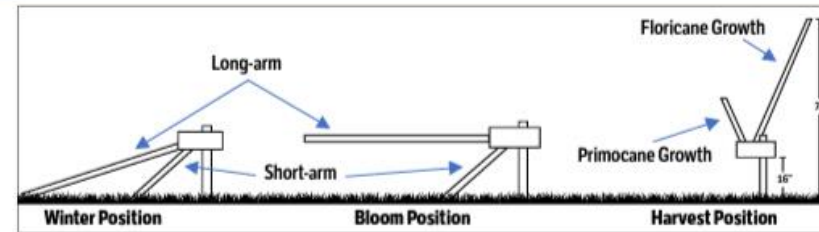


Figure 8. Rotation positions for the RCA. Image adapted from [Trellis Growing Systems](#)

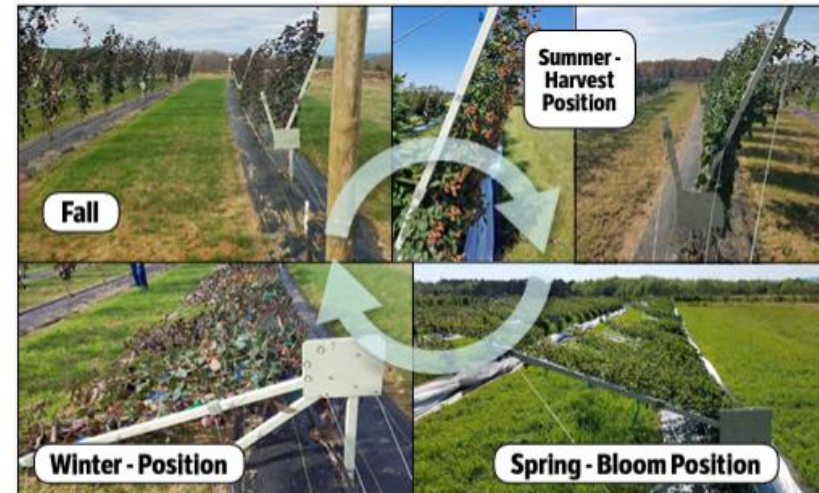


Figure 9. View of the three main trellis positions of the rotating cross-arm trellis through a season.



## Rotating Cross-Arm Trellis for Blackberry Systems

Part One: Introduction to the RCA Trellis

## RCA Trellis for Blackberry Systems Series

UAEX Fruit & Vegetable

Public ▾

6 videos 230 views Last updated on Aug 13, 2023



### RCA Trellis for Blackberry Systems Series | Part 1: Introduction to the RCA Trellis

UAEX Fruit & Vegetable • 456 views • 3 months ago



### RCA Trellis for Blackberry Systems Series | Part 2: RCA Trellis Throughout the Year

UAEX Fruit & Vegetable • 274 views • 3 months ago



### RCA Trellis for Blackberry Systems Series | Part 3: Installation & First-Year Management

UAEX Fruit & Vegetable • 206 views • 3 months ago



### RCA Trellis for Blackberry Systems Series | Part 4: Primocane Bending Method

UAEX Fruit & Vegetable • 171 views • 3 months ago



### RCA Trellis for Blackberry Systems Series | Part 5: Primocane Fan Method



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