

# What happens when Cabernet Sauvignon grapevines are converted from spur pruning to cane pruning at five-foot vine spacing?

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## Two under-trellis management schemes:

- Herbicide strip (85 cm wide)
- Under trellis cover crop

## Three rootstocks:

- 101-14
- 420-A
- Riparia Gloire

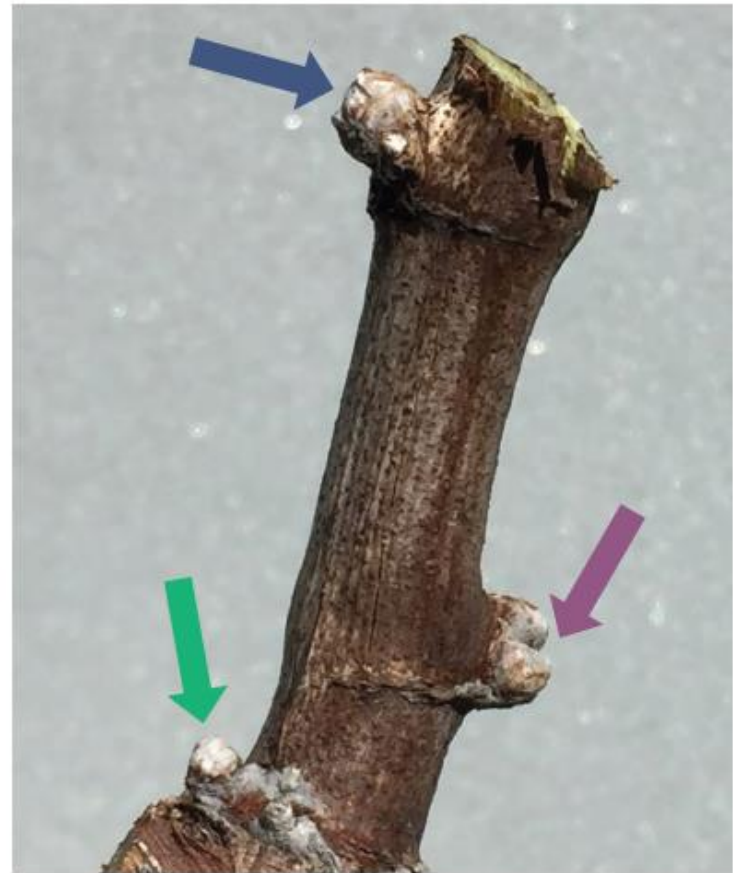
## Two root manipulations:

- Rootbag (root restriction)
- Non-root restricted

+ Cane Pruning



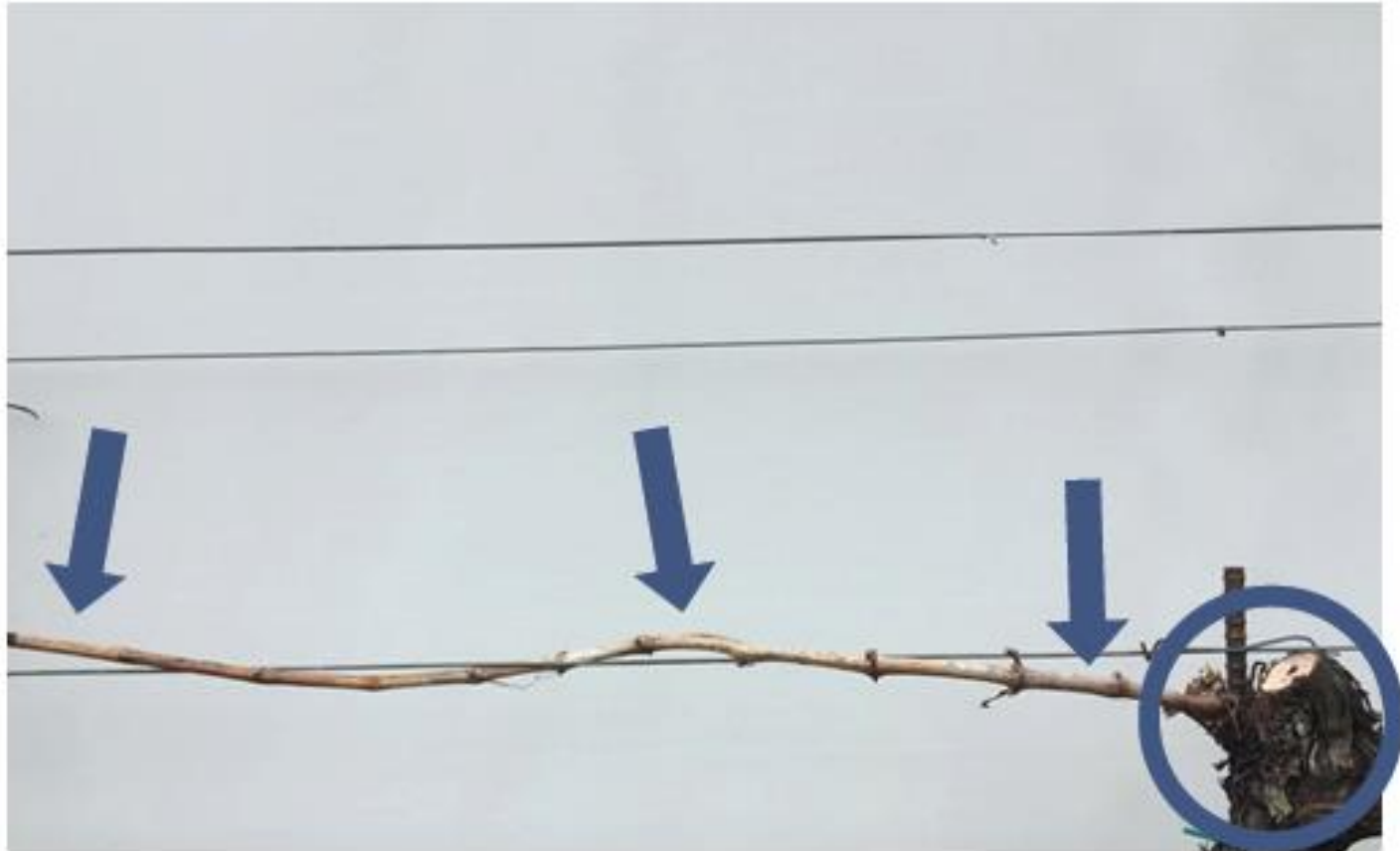
# CORDON-TRAINING AND SPUR-PRUNING



Images: Hickey & Hatch, UGA 1505



# HEAD-TRAINING AND CANE-PRUNING



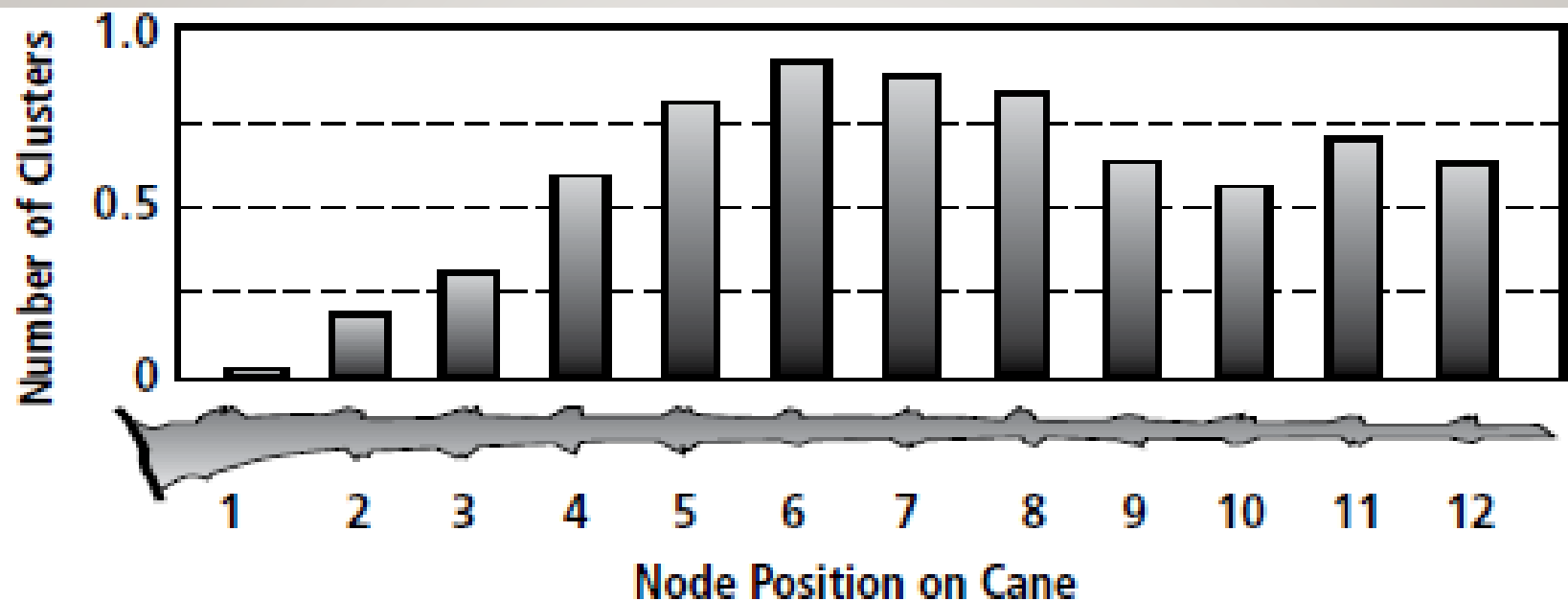
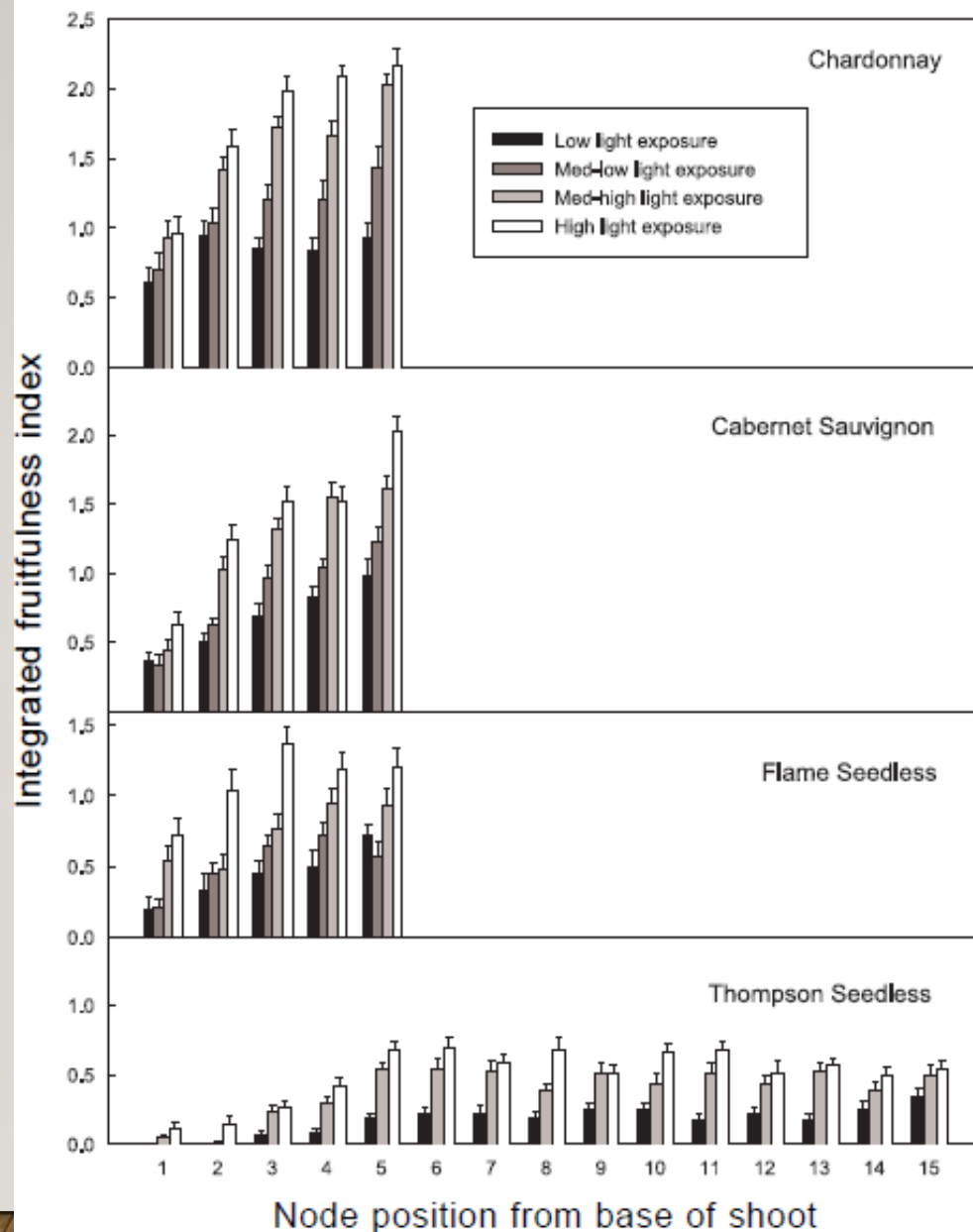


Figure 13.1 Bud break and fruitfulness pattern of 'Thompson Seedless' fruiting canes. The mean percentage of shoot emergence and number of clusters per node are shown for each node position, 1 through 12, from the base. The graph represents a mean of 48 data canes recorded over 3 years.







## TIMELINE

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- 2006 – vineyard installed
  - All vines trained with two trunks and two cordons
- 2012 – Sub-set of vines converted
  - One trunk and head/trained and Cane/pruned
- 2013
  - Data collection
- 2014
  - Data collection
- 2015
  - Data collection

# PERENNIAL PLANTS: STORE CARBOHYDRATES AND NUTRIENTS

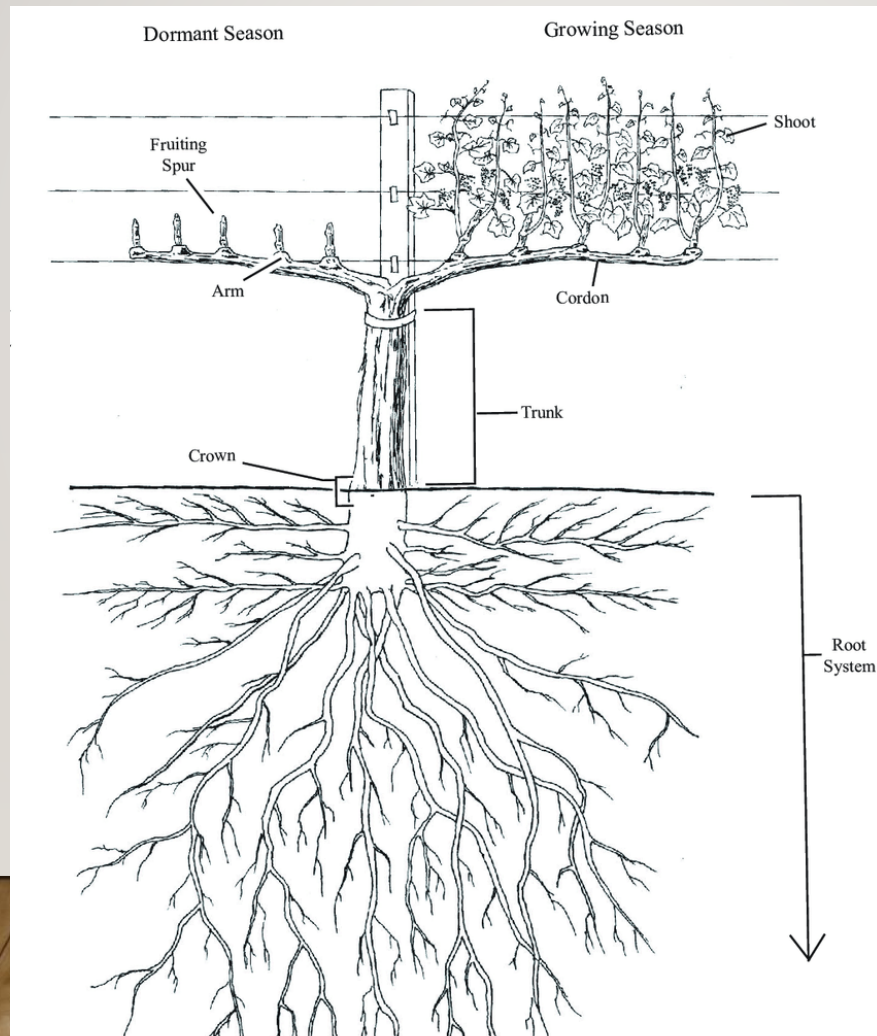


Image:  
Hellman, Edward.  
(2003). Grapevine  
Structure and Function.  
Grape Grower's  
Handbook.

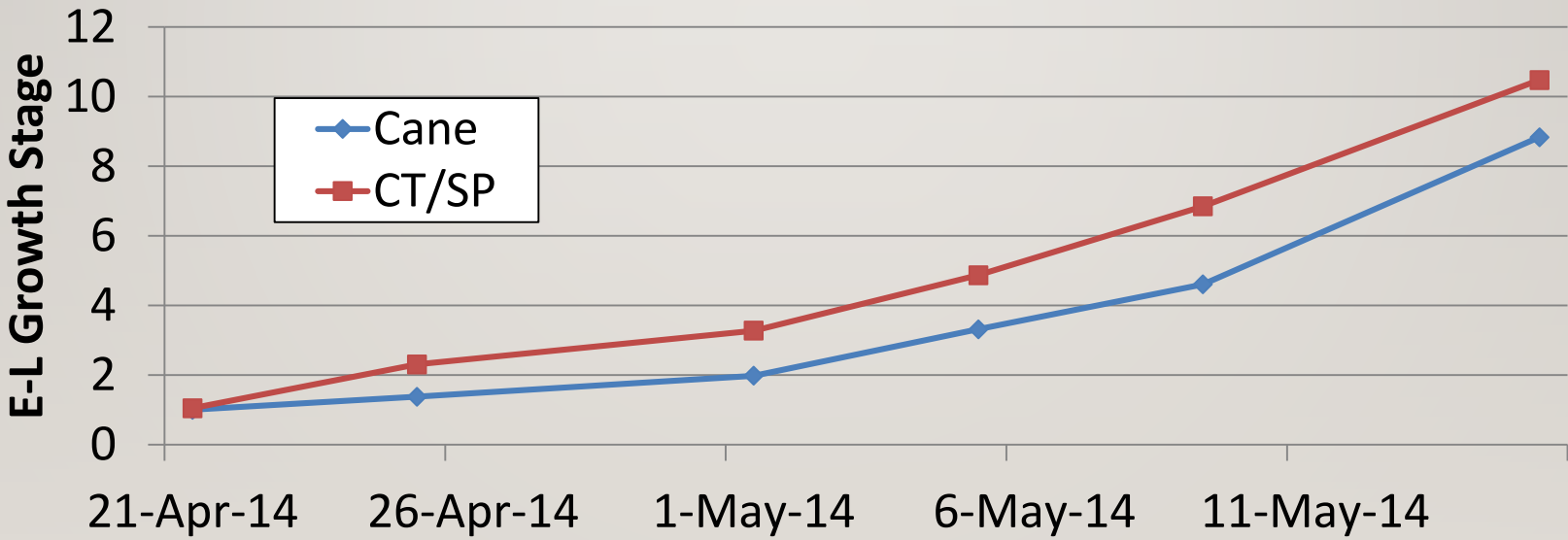
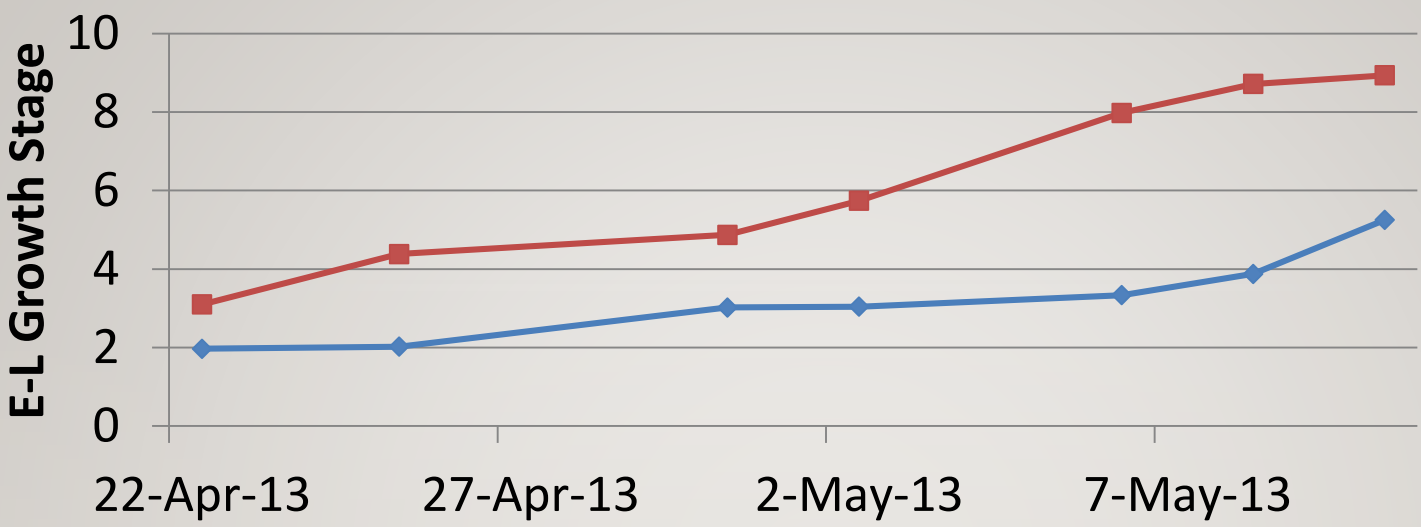
# WHAT DID WE SEE?

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- Phenology
- Shoot density
- Vegetative growth
- What was similar?
  - Brix
  - Crop level
  - Uniformity of shoots



# BUDBREAK DELAY



# BUT...

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- At bloom
    - We still saw a delay
    - More clusters at 50% bloom for spur trained
  - At veraison
    - Flipped
    - Onset of color change happened first with cane pruned
  - And harvest....

	Count shoot fruitfulness (clusters/shoot)			Total shoot count (shoots/vine)		
Pruning treatment	2013	2014	2015	2013	2014	2015
Cane-pruned	2.0	1.9	1.9	24	19	23
Spur-pruned	1.6	1.5	1.7	46	44	45
Percent change with cane- pruning compared to spur-pruning	25%	27%	14%	-48%	-57%	-49%





	<b>Yield (Pounds/foot of row)</b>	<b>Tons per acre</b>
<b>2012</b>		
<b>Cane</b>	2.2	5.5
<b>Spur</b>	2.6	6.5
<b>Prob &gt; F</b>	0.0049	
<b>2013</b>		
<b>Cane</b>	2.2	5.5
<b>Spur</b>	2.0	5
<b>Prob &gt; F</b>	ns	
<b>2014</b>		
<b>Cane</b>	2.1	5.25
<b>Spur</b>	1.5	3.75
<b>Prob &gt; F</b>	<.0001	
<b>2015</b>		
<b>Cane</b>	2.4	6.0
<b>Spur</b>	1.7	4.25
<b>Prob &gt; F</b>	<.0001	

	<b>Brix</b>	<b>pH</b>	<b>TA (g/L)</b>
<b>2012</b>			
<b>Cane</b>	22.7	3.94	4.1
<b>Spur</b>	22.3	3.39	4.6
<b>Prob &gt; F</b>	ns	<.0001	ns
<b>2013</b>			
<b>Cane</b>	22.3	3.16	9.1
<b>Spur</b>	22.2	3.34	7.5
<b>Prob &gt; F</b>	ns	<.0001	0.0001
<b>2014</b>			
<b>Cane</b>	21.8	3.90	4.6
<b>Spur</b>	21.8	3.97	4.4
<b>Prob &gt; F</b>	ns	ns	ns
<b>2015</b>			
<b>Cane</b>	21.52	3.47	7.4
<b>Spur</b>	21.68	3.58	5.7
<b>Prob &gt; F</b>	ns	0.0154	<.0001





# YIELD TO PRUNING

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- Crop weight per vine/ pruning weight per vine =
- Target ratio 5-10

	<b>Yield (kg /vine)</b>	<b>Pruning (kg/vine)</b>	<b>Crop load</b>
<b>2012</b>			
<b>Cane</b>	5.0	1.1	4.9
<b>Spur</b>	5.9	1.5	4.2
<b>Prob &gt; F</b>	0.0049	<.0001	ns
<b>2013</b>			
<b>Cane</b>	5.1	1.0	5.3
<b>Spur</b>	4.5	1.4	3.3
<b>Prob &gt; F</b>	ns	0.0034	<.0001
<b>2014</b>			
<b>Cane</b>	4.7	1.2	4.2
<b>Spur</b>	3.4	1.7	2.2
<b>Prob &gt; F</b>	<.0001	<.0001	<.0001
<b>2015</b>			
<b>Cane</b>	5.5	1.7	3.4
<b>Spur</b>	3.8	2.0	2.0
<b>Prob &gt; F</b>	<.0001	0.0183	0.0003



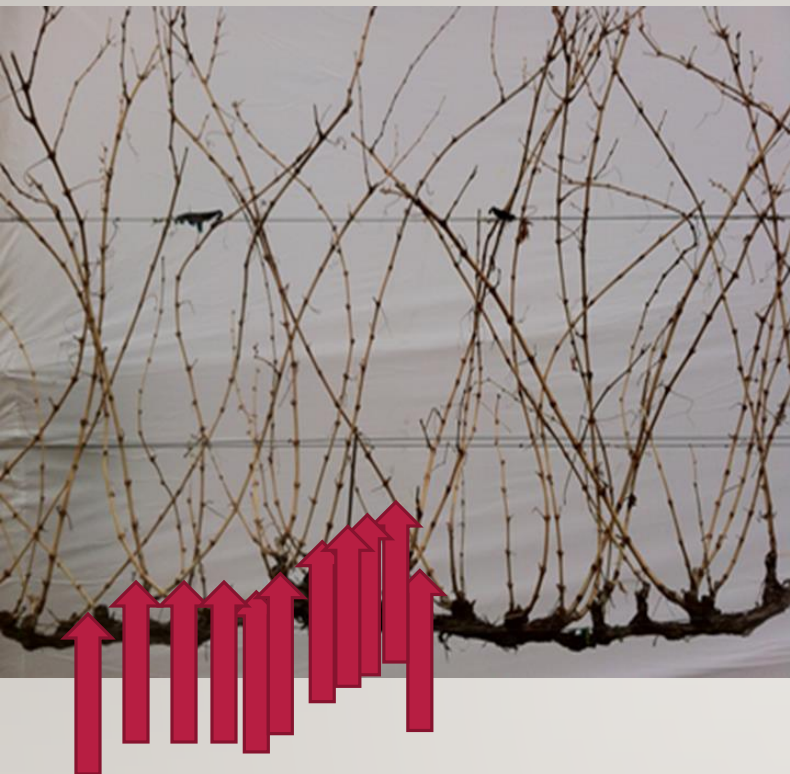








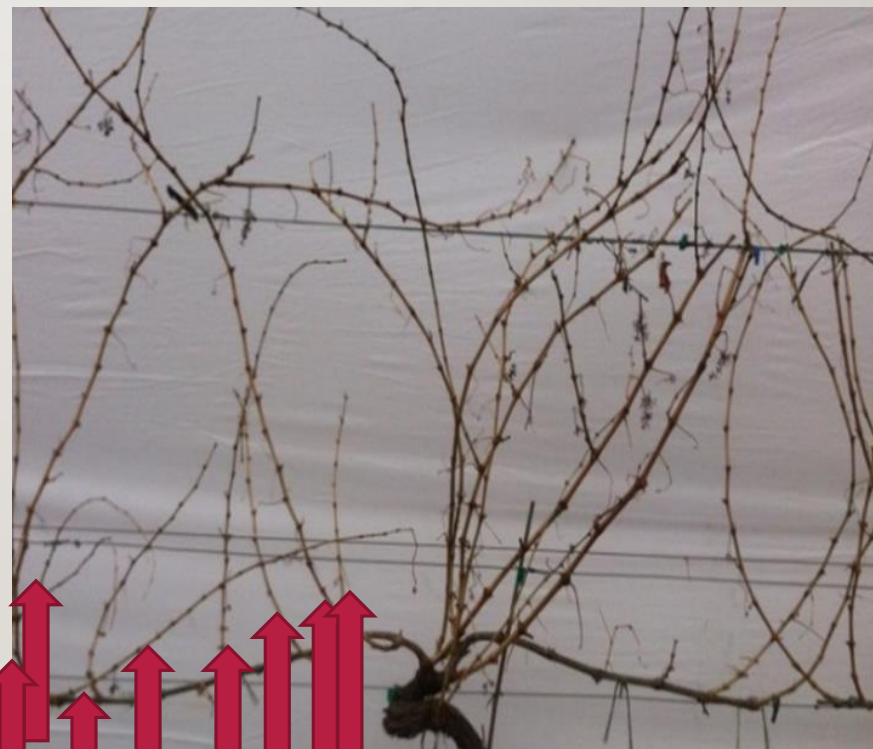




Total of 148 & 364 shoots tagged:

Harvested separately

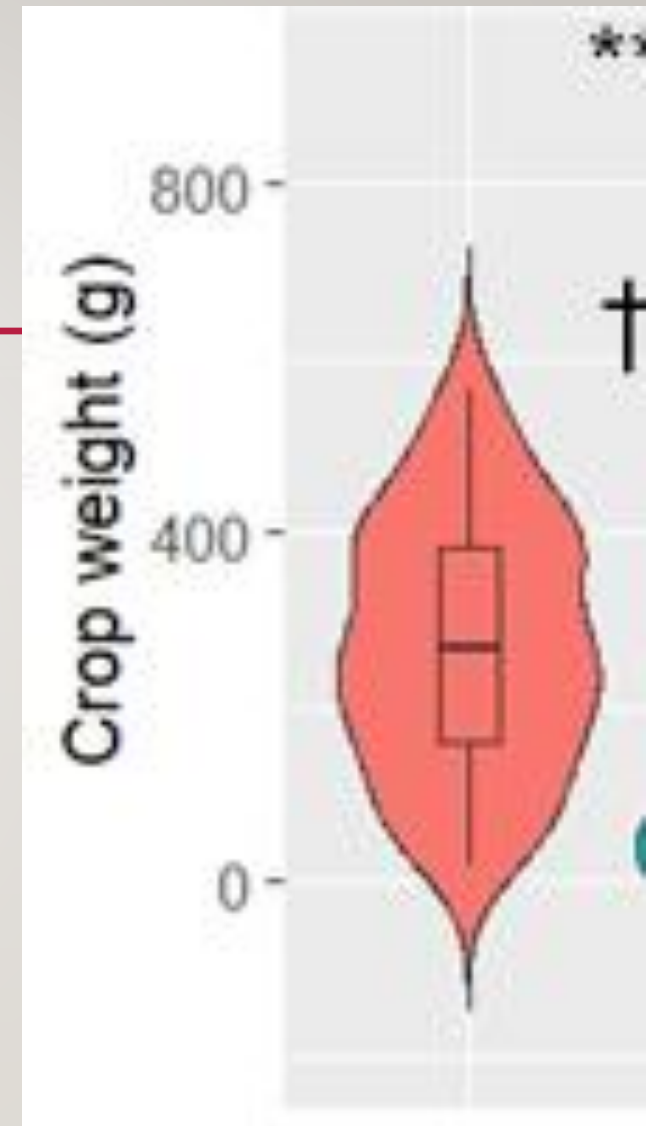
- Yield weight
- Primary fruit chemistry
- Pruned and weighed separately



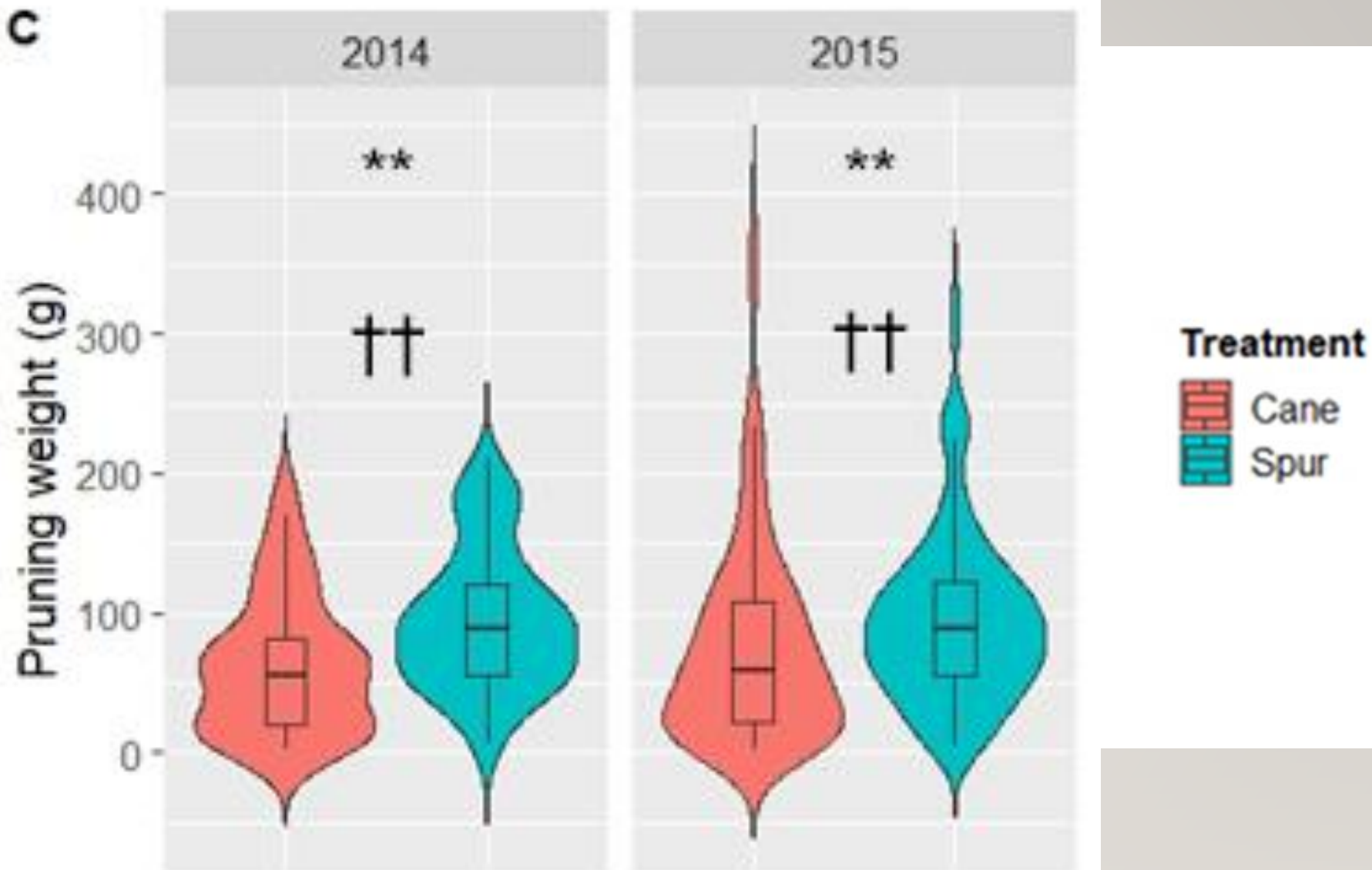
# VIOLIN PLOT

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- The horizontal line within the box represents the median sample value.
- The violin plot width shows the density of response observations at the y-axis value – in essence, the wider the “violin” body, the higher concentration of data at that point of the y-axis value.
- The taller the violin body the more variable (less uniform) the data is....



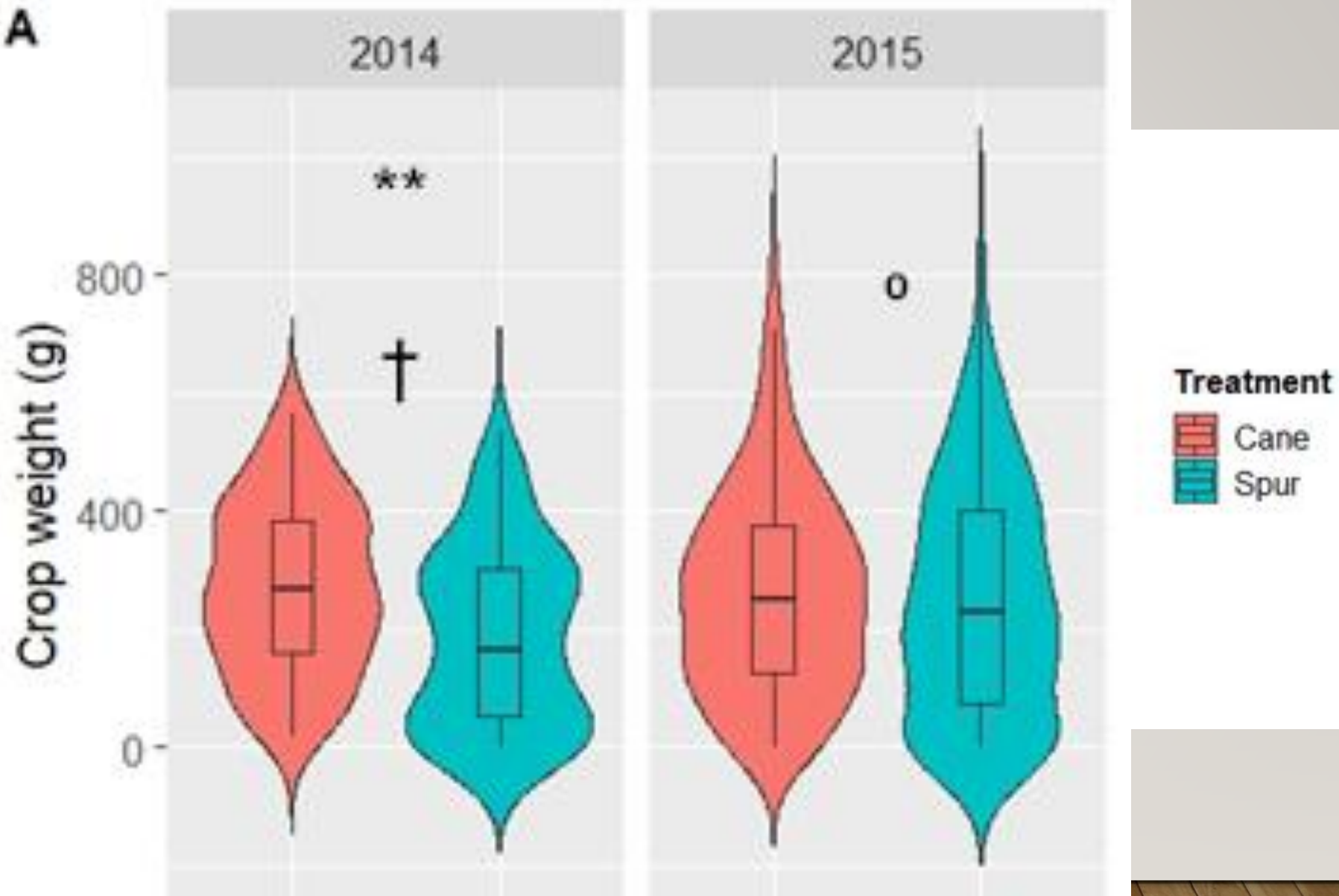
c



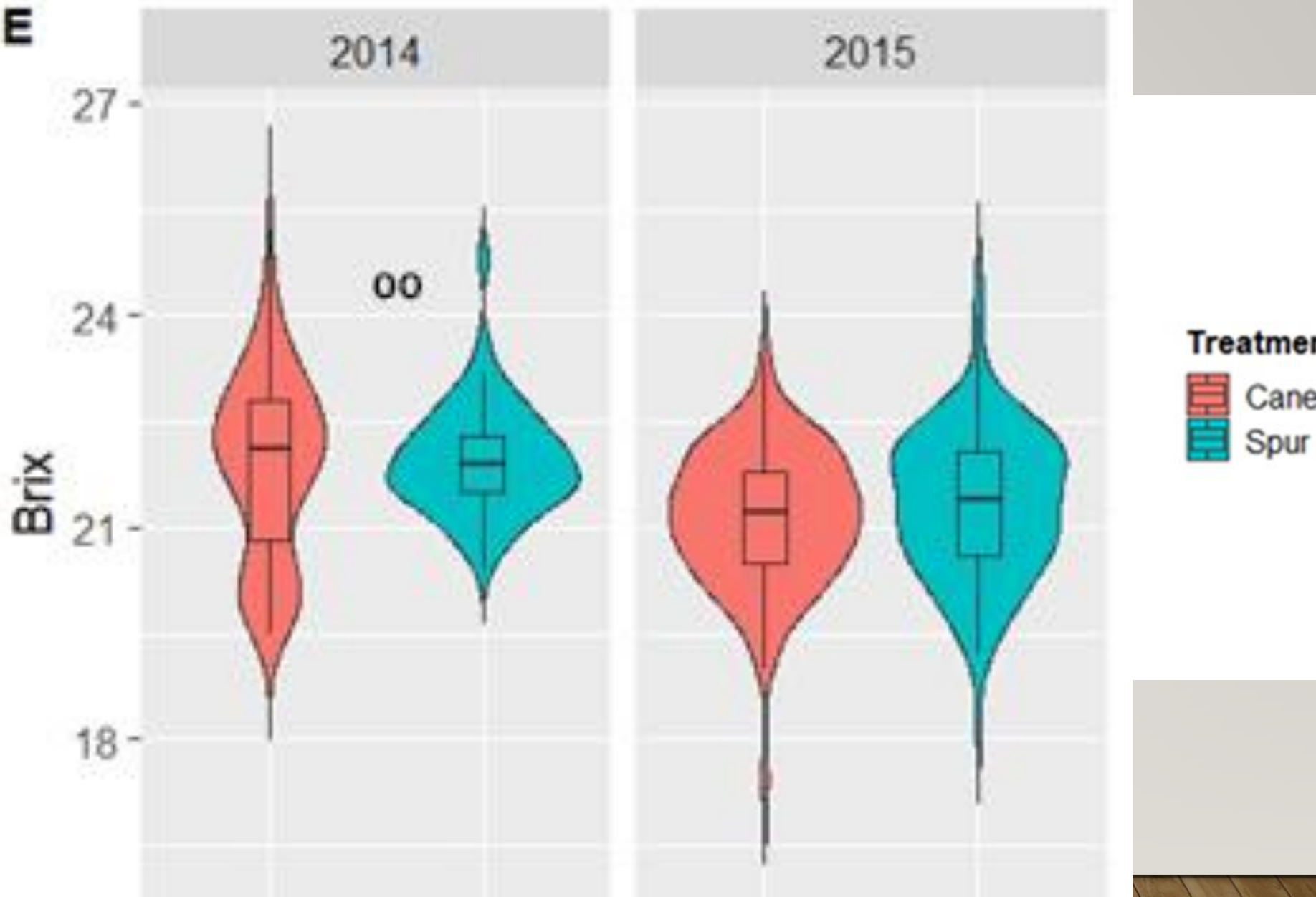






**A**



**E**



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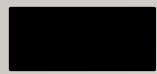
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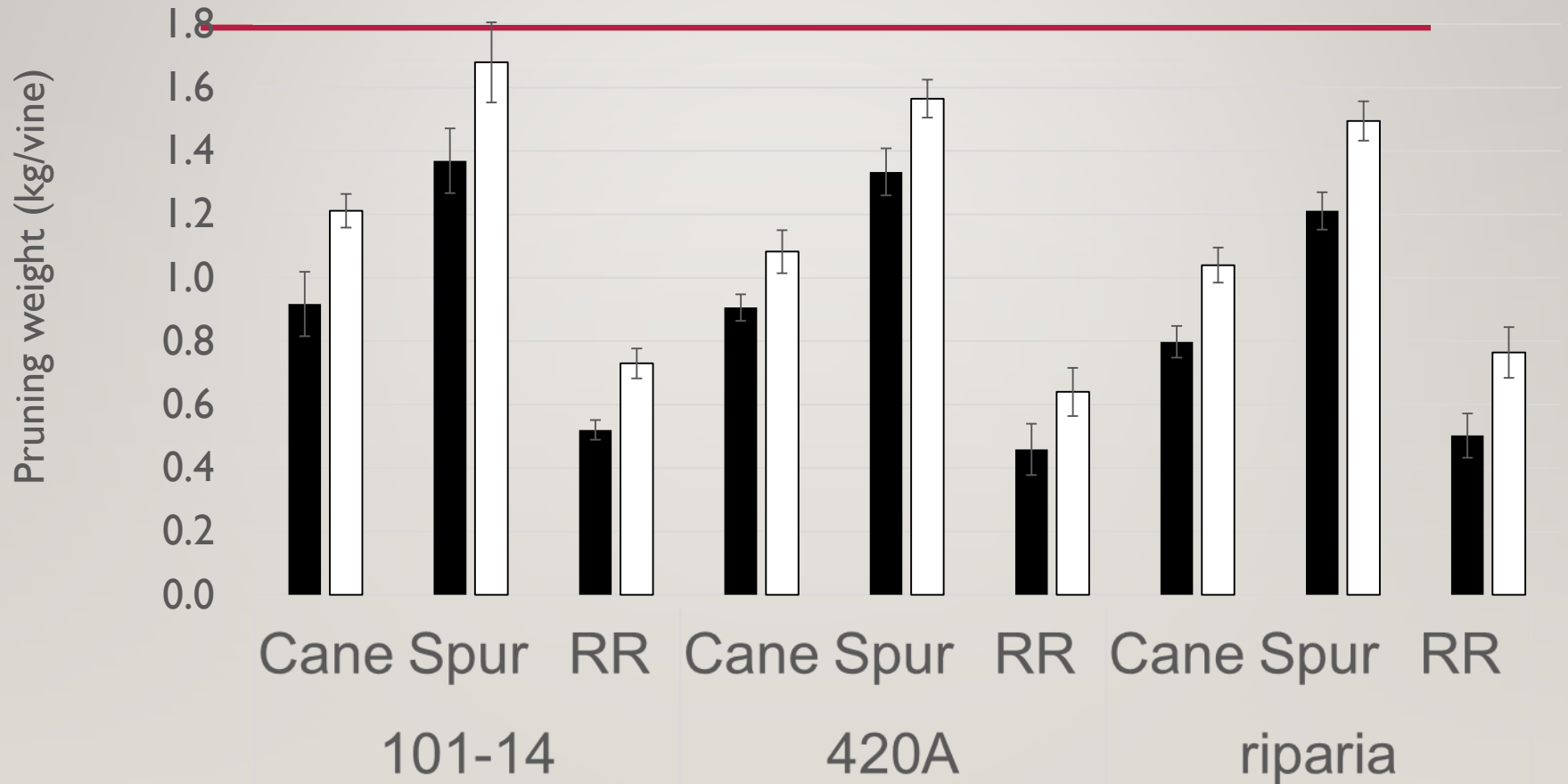




COVER CROP BELOW TRELLIS



HERBICIDE BELOW TRELLIS



# CANE PRUNING

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- Delay in bud break 🍊 , but...
- Slightly less vegetative growth 🍊 , but...
- Similar canopy characteristics
- Similar primary fruit chemistry
- more crop 🍊
- What variety are you growing?? What buds are fruitful?



# OK, SO CANE PRUNING WORKS AT FIVE FEET...

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- What about if I planted at 4 feet...
- What about if I planted at 7 feet....
- How does this relate to the conservative pruning....





# THANK YOU!

