

# Farmer-Led Research 2019: Tomato Grafting Trial



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SEED PRODUCTION  
& BREEDING

## Farmer-Researcher(s)

Eric Barnhorst, Eva Mae Farm - East  
Jenny Cook, Knuckle Down Farm - East  
Sarah Judd, Meadow Lynn Market - West  
Nathan Klassen, Nith Valley Organics - West

## EFAO Contact

Sarah Hargreaves, [sarah@efao.ca](mailto:sarah@efao.ca), 226-582-0626 (chat and textable)

This document outlines the steps that Eric, Jenny, Sarah and Nathan will follow to execute their research project, *The benefits of tomato grafting in unheated hoop houses*, including design, execution, data collection and data sharing. It also serves as a Memorandum of Understanding between the farmers and EFAO.

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## Background

Specialized tomato rootstock seems to have a lot of potential, but it is unclear if they are well-developed for unheated hoophouses. Given the cost of the rootstock, extra labour, equipment and greenhouse space required to graft, these growers want to know:

*Are grafted tomatoes economically worthwhile in unheated hoophouses in Ontario?*

## Experimental Design

For randomization, see data collection sheets at the end the document.

Detail	Eric	Jenny	Sarah	Nathan
# leaders	2	1	2	
In-row spacing	24"	12"	24"	
Bed size / plot size available	5 x 50'	1x 50' long		
# replicates	3-5	3	3	3?
Target # plants/replicate for grafted and control	12	8	10	
Total plants	72 - 120	48		

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## Methods and Materials

Variety	Type	Source	Cost	Farmers
Estamino	Rootstock	Johnny's	~\$63 USD	Eric, Jenny, Sarah
Marbonne	Scion variety	Johnny's	~\$60 USD	Eric, Jenny
Margold	Scion variety	Johnny's	~\$100 USD	Eric, Jenny
Tomimaru Muchoo	Scion variety	Johnny's	~\$45 USD	Eric
Moskvich	Scion variety	Prev yr	0	Eric, Jenny
Black Prince	Scion variety	Prev yr	0	Eric
Maxifort	Rootstock			Nathan, Sarah
Cayman	Scion variety			Nathan
Abrasson	Scion variety	William Dam		Sarah

The growers will seed grafted tomatoes between mid-late February. They will seed un-grafted tomatoes 10-14 days after seeding the grafted tomatoes. They will graft in March, and heal the grafted tomatoes for a one week. They plan to transplant late April - May.

## Measurements

Evaluation Forms

**Hoophouse Set-up and Measurement Flow** (print sheet at end of document)

**Crop Management and Plant Health** (print sheet at end of document)

**End of Season Questions** (print sheet at end of document)

**[Harvest Forms for Marketable Yield](#)** (print separate document, linked)

Other Measurements:

**Labour** (Eric and Nathan will track these separately)

Seedling production time:

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- Rootstock + scion seeding vs ungrafted seeding
- Grafting
- Healing



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**Cost** (Eric and Nathan will track these separately)

Cost of rootstock, supplies, healing chamber, extra space in greenhouse

### Research Expense Budget

Prices are approximate; NA or in-kind for any materials that you already own or have access to. Please indicate if you intend to give any of the supplies to EFAO's Tool Library for others to use after you are finished with them.

Material	Quantity	Unit	Total Cost	EFAO's Tool Library (Y/N)
Rootstock seed				N
Scion variety seed				N
Healing chamber supplies				N
Postage to mail the scales				N
Scale				Y

### Research Calendar

Time	Task	Action Item
Mid-late April	Grafting completed	Sarah will contact; farmer-researchers will fill in datasheet with final grafting population numbers
Late May	Transplanting complete!!	Sarah will contact; get final numbers for the experiment
Mid July	First harvest	Sarah will contact separately to see how harvesting is going. Group check in too?
Fall	Data collection and entry	Sarah will contact

### Resources

[cdn.sare.org/wp-content/uploads/20180312145510/2016-Masterson-et-al.-HortTech\\_Prop.pdf](http://cdn.sare.org/wp-content/uploads/20180312145510/2016-Masterson-et-al.-HortTech_Prop.pdf)

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[cru.cahe.wsu.edu/CEPublications/FS051E/FS051E.pdf](http://cru.cahe.wsu.edu/CEPublications/FS051E/FS051E.pdf)

[cru.cahe.wsu.edu/CEPublications/FS052E/FS052E.pdf](http://cru.cahe.wsu.edu/CEPublications/FS052E/FS052E.pdf)



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[www.walterreeves.com/wp-content/uploads/2010/11/tomato-grafting-guide.compressed.pdf](http://www.walterreeves.com/wp-content/uploads/2010/11/tomato-grafting-guide.compressed.pdf)

Deadline for data, progress report and photo submission

October 31, 2019 for all data and photos.

### Memorandum of Understanding

Please refer to [efao.ca/research-mou](http://efao.ca/research-mou) for Memorandum of Understanding.

### Acknowledgements

We thank members of the Advisory Panel, Eric Barnhorst, Jason Hayes, Matt Jones, Ken Laing, Annie Richard, Darrell Roes, Steven Wolgram and Dr. Ralph Martin, for their thoughtful input that helped guide the design of this trial. We also thank Kristine Lang and Dr. Ajay Nair of Iowa State University for their advice with project design and yield measurements.

### Funding

Funding for this project was made possible by support from the Ontario Trillium Foundation, an agency of the Government of Ontario, and Robert and Moira Sansom Ideas Foundation, a fund within London Community Foundation.

The Robert and Moira Ideas Foundation,  
a fund within the

Ontario  
Trillium Foundation



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## Hoophouse Set-up for Eric and Jenny

### Eric

5 rows, each with 1 randomly assigned scion variety

Each half row is randomly assigned grafted (G) or ungrafted (U)

Target 12 grafted + 12 ungrafted per 50' row

Scion Variety	Row	In-row arrangement	Actual Row	Actual in-row arrangement
Margold	1	G / U		
Tomimaru Muchoo	2	U / G		
Moskvich	3	G / U		
Black Prince	4	G / U		
Marbonne	5	U / G		

### Jenny

1 row, with scion varieties randomly assigned to one of three sections down the row

Each half section is randomly assigned grafted (G) or ungrafted (U)

Target 8 grafted + 8 ungrafted plants per section = 48 plants per 50' bed

Scion Variety	Section	In-section arrangement	Actual order	Actual arrangement
Moskvich	1	G / U		
Margold	2	G / U		
Marbonne	3	U / G		

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## Hoophouse Set-up for Sarah and Nathan

Sarah J.

3 rows, with scion variety or varieties randomly assigned to one of three sections down the row

**→ If you use more than one scion variety, then randomly choose the row assignment for each variety and record below.**

Each half section is randomly assigned grafted (G) or ungrafted (U)

Target 8 grafted + 8 ungrafted plants per section

<b>Scion Variety</b>	<b>Row (see bold above)</b>	<b>In-row arrangement</b>	<b>Actual arrangement</b>
Abrasson		<b>G / U</b>	
Other?		<b>G / U</b>	
Other?		<b>G / U</b>	

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Nathan

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## Crop Management and Plant Health Records

Farm Name: \_\_\_\_\_

You can also record this directly online in the **Tomato Grafting Trial Google Sheet** (preferred).

Record	Detail
Grafting Date(s)	
Notes on grafting	
Seeding Date	
Notes on seedlings	
Transplant Date	
In-row spacing	
Between-row spacing	
<b>First fruit</b>	
<b>Last fruit</b>	
Fertilizer applications (rate, amount, and date)	
Other products used (rate, amount, purpose, date)	

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### End-of-Season Questions

You can also record this directly online in the **Tomato Grafting Trial Google Sheet** (preferred).

1. Which were your favourite rootstock and/or scion varieties in this trial and why?
  
  
  
  
  
  
  
  
  
  
2. Which were your least favourite rootstock and/or scion varieties in this trial and why?
  
  
  
  
  
  
  
  
  
  
3. How do you normally market your lettuce? (*Circle all that apply*)  
a.) CSA b.) farmers' market c.) farm stand d.) wholesale e.) other - please describe
  
  
  
  
  
  
  
  
  
  
4. What were the biggest challenges for tomato production in this (2019) growing season?  
For example, weather patterns, diseases, insect pests, etc...
  
  
  
  
  
  
  
  
  
  
5. Other comments