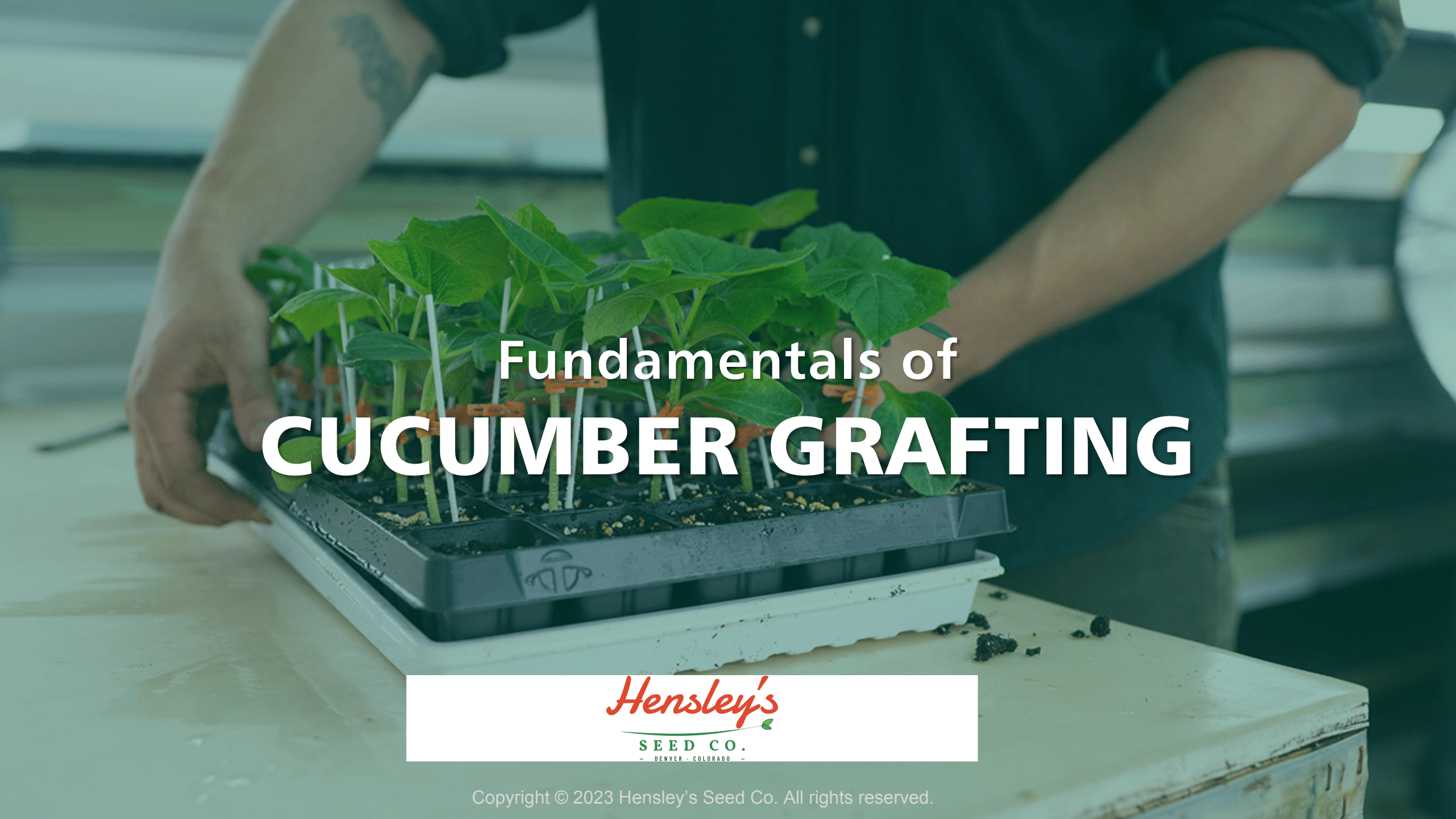


Fundamentals of
CUCUMBER GRAFTING

Hensley's SEED CO. DENVER · COLORADO

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the original research farm

Trial site in USDA zone 5b

- **200 acres managed**
- **25 miles of beds in production**
- **Emphasis on soil heath:**
  - **Wide production spacing to facilitate crop rotations**
  - **50+% of acreage in cover cropping annually**
  - **Extensive organic mulch inputs**



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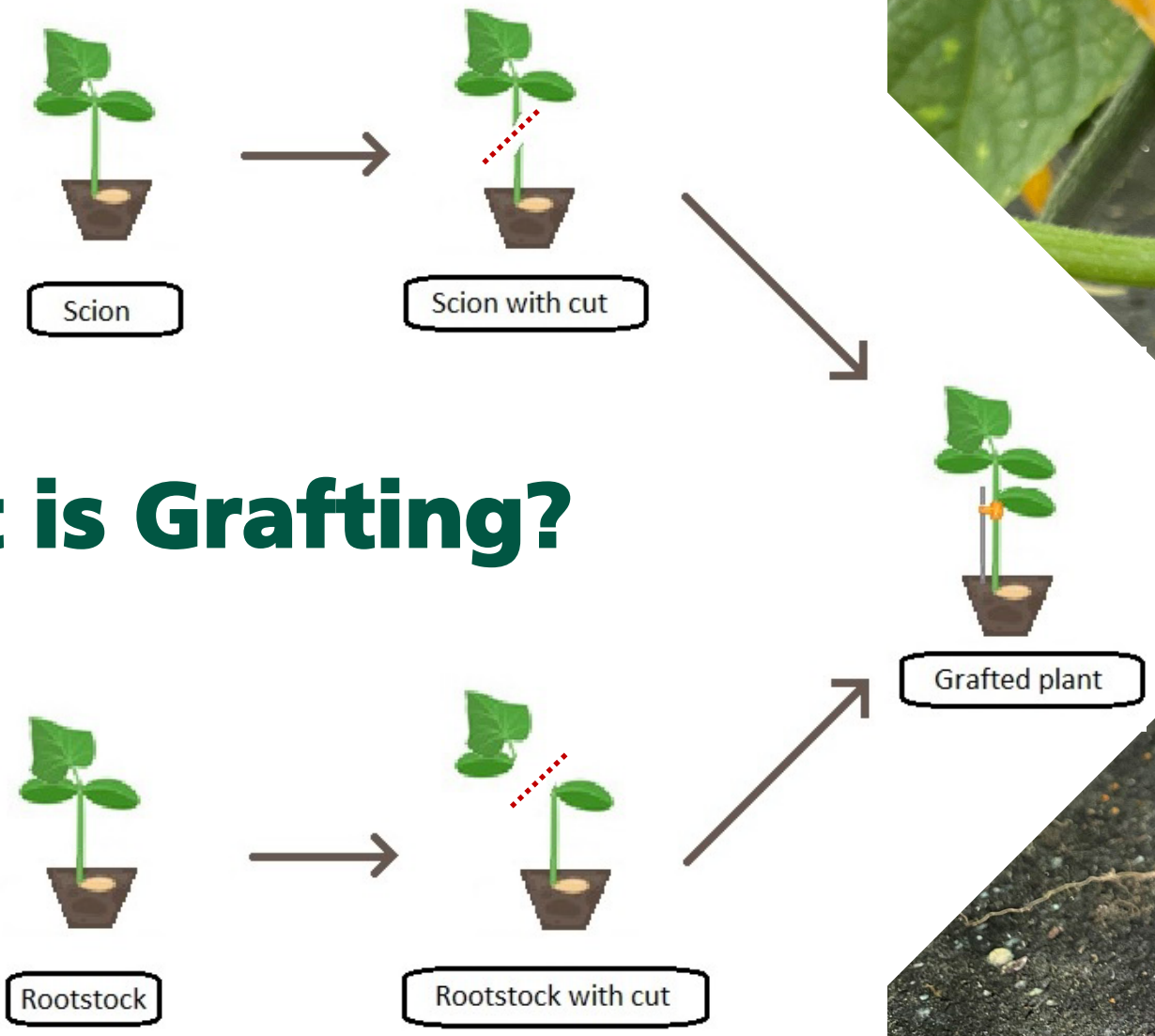
TRIALING & SELECTION

- Approx. 3,000 varieties trialed in 2022, resulting in over 100 products added
- Year-round effort to select superior new products and substitutions
- Includes regional trials across the country with growers, universities, field day events, & more



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What is Grafting?





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Benefits of Grafting

Season Extension

- Increased survival rate and improved plant vigor in cold soil
- Improved stress tolerance

Yield Potential

- Higher yields, particularly early in the season
- Longer production
- Healthy plants



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Benefits of Grafting

Disease Resistance

- Fusarium resistance the most common
- Root-Knot Nematode
- Verticillium
- Some rootstocks claim improved resistance to foliar diseases such as Powdery Mildew
- Seen remarkable results in source trials with resistance to Spider Mites



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Important Considerations

- **Grafting doesn't necessarily improve all varieties' performance**
  - Important to know when and where it's needed
- **Cost**
  - Set up
  - Added seed cost
  - Time
- **Special cultural management**
  - Pruning/training
  - Fertility to match growth
- **<u>Preparation is key</u>**



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Preparation is Key

Pre-Grafting Set-Up

Prepare for Sowing

- Getting the timing right
- Practice round(s)
- Sow successions (at least 2) 1-2 weeks prior to top-grafting
- Ideal germination
- Monitor growth rates

Prepare for Grafting

- Be ready to go (chamber, tools, supplies)
- Deep water beforehand
- Sanitize work area and tools

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Pre-Grafting Set-Up

Required Materials

- Scion seed (top or fruiting variety)
- Rootstock seed (bottom or base variety)
- Your preferred growing medium
- Plug trays of your desired cell size
- Shallow leakproof trays
- A disinfectant, such as Virkon® or a 1:10 bleach solution
- An old-fashioned, double-edged razorblade
- Grafting clips
- Narrow plastic straws, or similar, for supporting the grafted seedling
- A spray bottle or hose mister
- 7" Humidity domes and/or a healing chamber



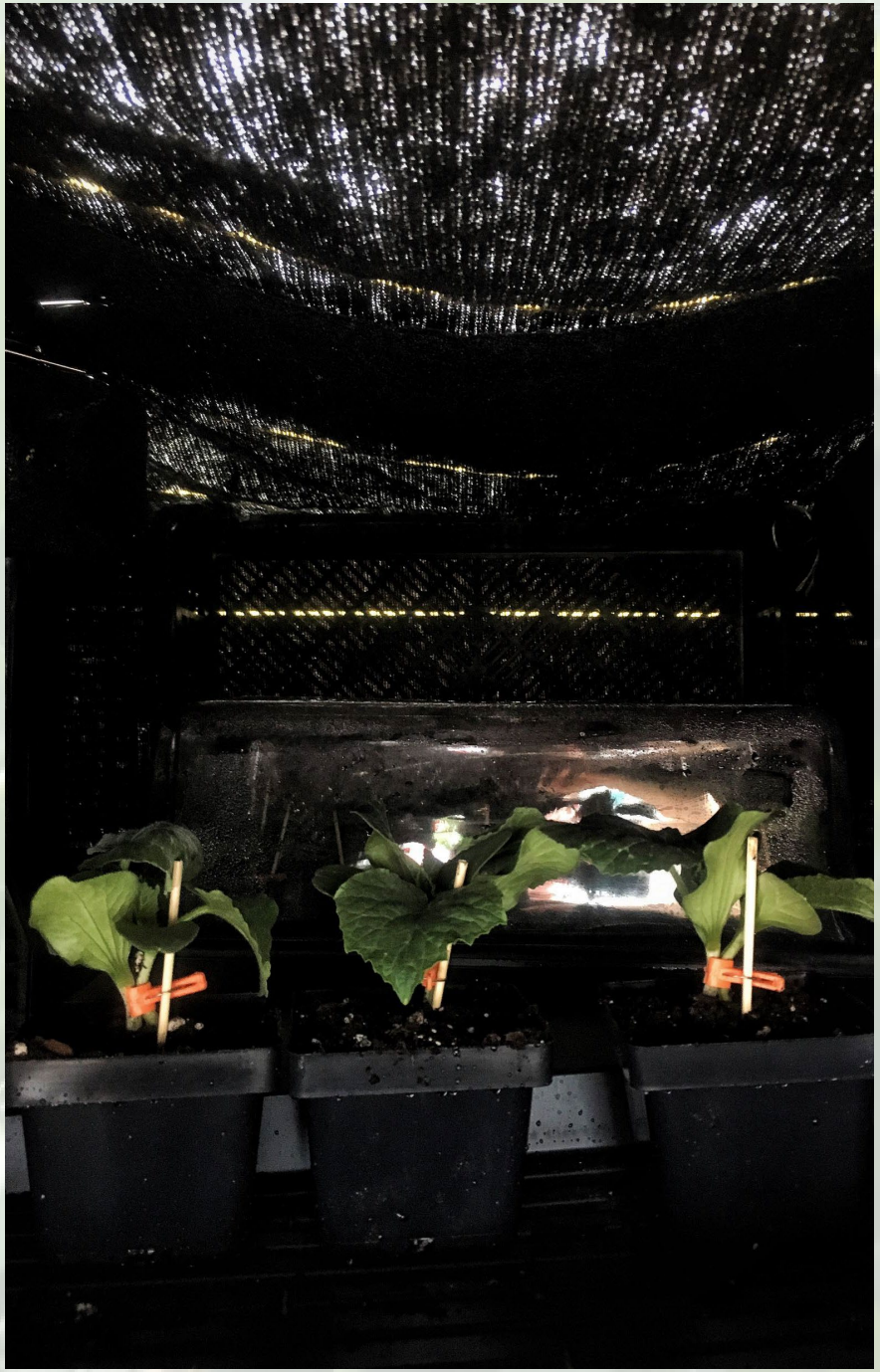
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Pre-Grafting Set-Up

The Healing Chamber

Create a space for plants to survive for 3 to 4 days without roots while they heal

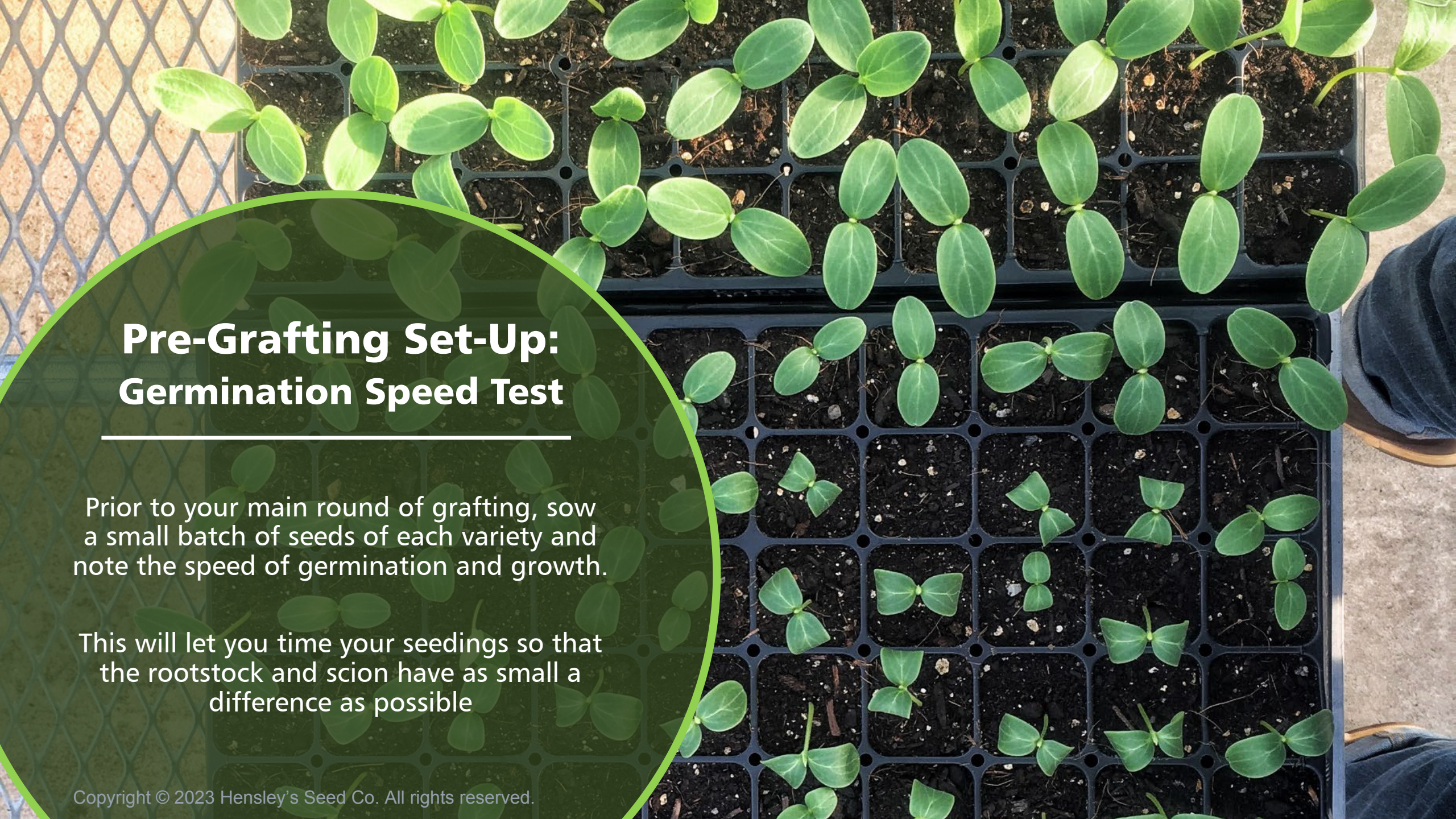
- High Humidity of 95-100%
- Constant Temperature of 77-89°F
- Controlled Lighting
  - Darkness at first to prevent respiration
  - Light gradually increased as grafted plants heal







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Pre-Grafting Set-Up:
Germination Speed Test

Prior to your main round of grafting, sow a small batch of seeds of each variety and note the speed of germination and growth.

This will let you time your seedings so that the rootstock and scion have as small a difference as possible

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Pre-Grafting Set-Up

Seeding Your Scion & Rootstock

- Sow seed about 4–5 weeks before your desired transplant date
- The healing process adds 1–2 weeks to the seedling propagation phase
- It is ideal for stem diameters of the rootstock and scion seedlings to be as closely matched as possible
- Sowing multiple successions and overseeding will raise chances of success
- Plants will be ready to graft approx. 5–7 days after the seedling emerges.
- The ideal time to graft your plants is when the first true leaves on both scion and rootstock have just begun to grow and expand.



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Grafting Methods

- There are typically three established methods of cucurbit grafting
  1. Top grafting
  2. Side/Approach grafting
  3. Hole-Insertion grafting

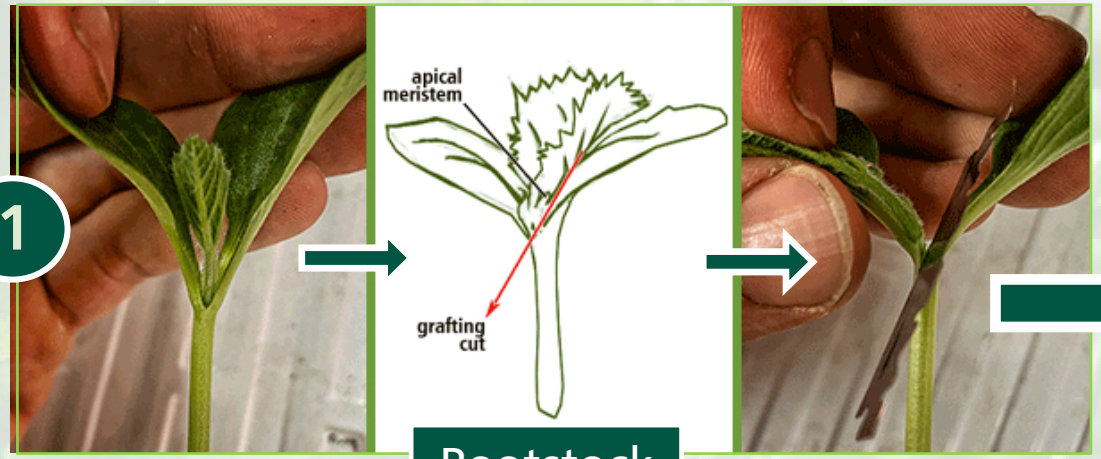
- Each has its pros and cons, but I have personally had the most success with top grafting
  - Simpler/efficient
  - Likely to be more familiar



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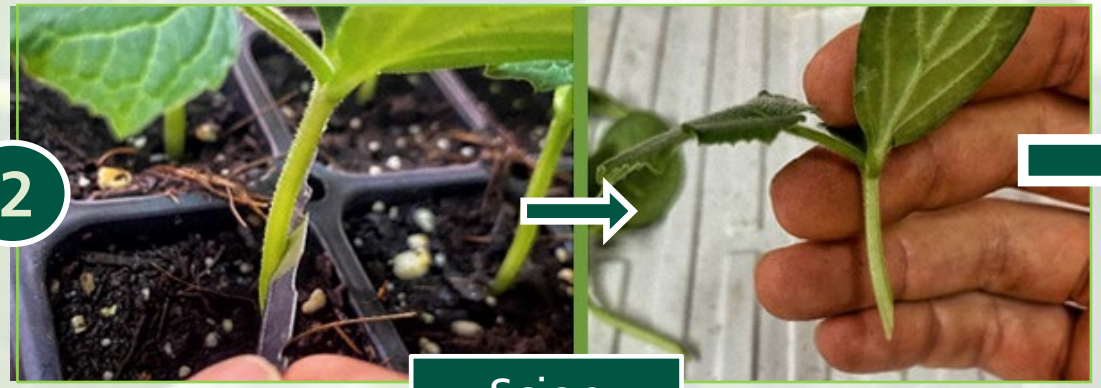
Top Grafting Process

1



Rootstock

2

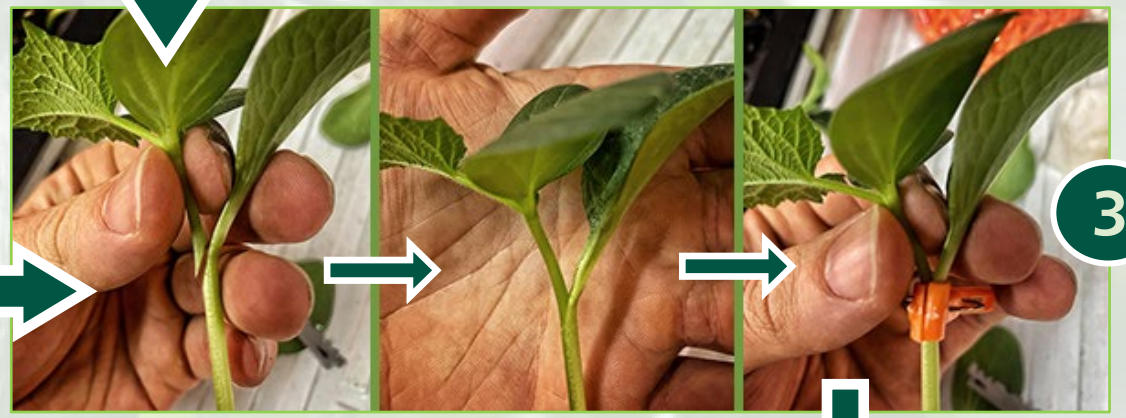


Scion

Left: Correct angle depth **Center**: Too deep **Right**: Too shallow



1.5



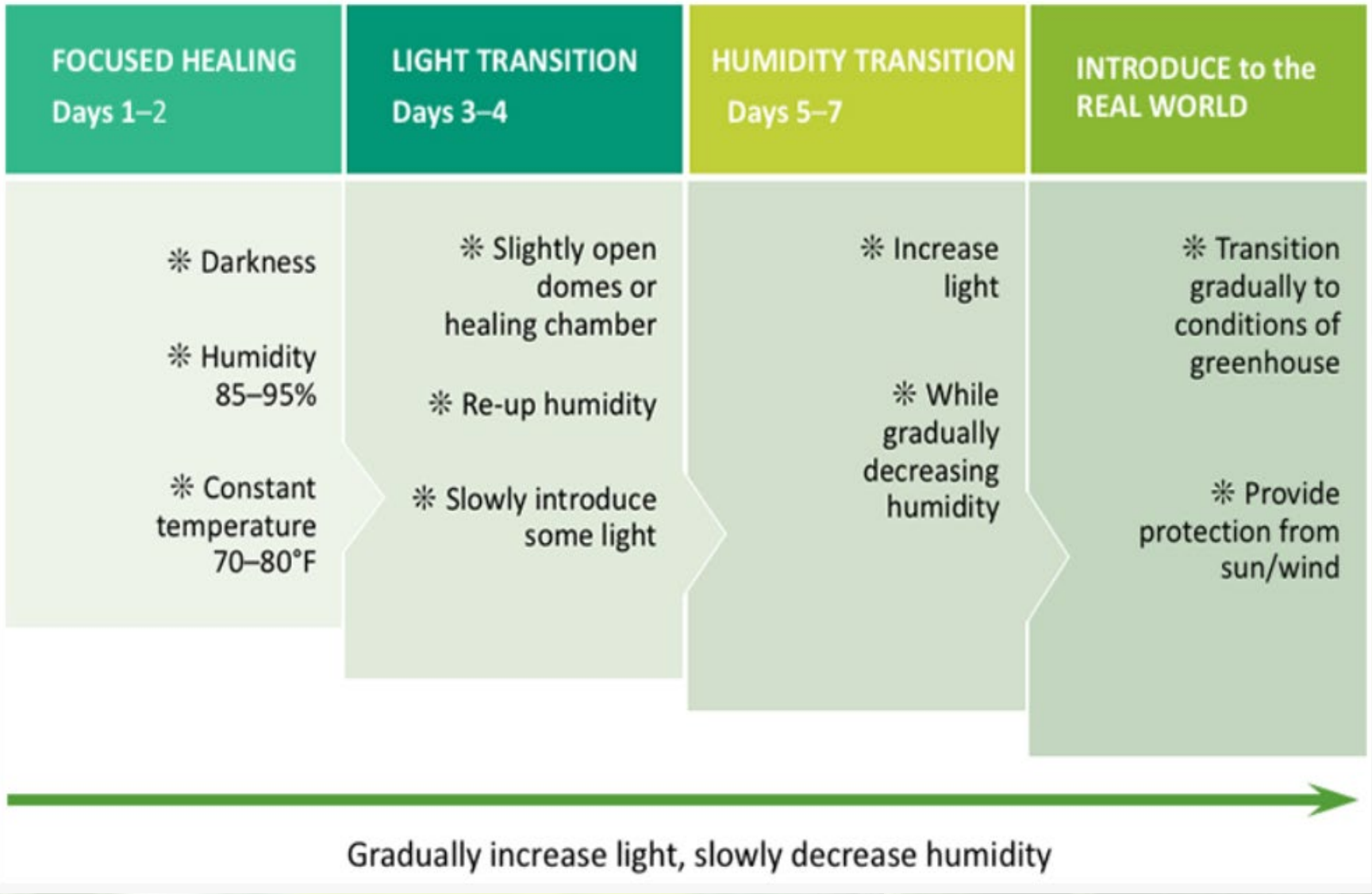
3



4

Completed Graft

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Healing Process

Requires:

- Regular monitoring
- Adjustments
- Fiddling & more fiddling

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VIDEO

Top Grafting Demonstration

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Grafting Technique Comparison

In a 2021 trial at the original source, One-Cotyledon Grafting with Rootstock Root Removal was much more successful:

- Higher survival rate
- More vigorous, healthier grafted plants.



Variety Name	Rootstock with Roots Removed % Survival After Grafting	Rootstock with Roots Kept % Survival After Grafting
Corinto	65	60
Nokya	95	60
Poniente	70	45
Unagi	35	20
Katrina	55	25
Picolino	45	30
Excelsior	65	15
Quirk	50	0

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Transplanting

- Care should be taken when transplanting to keep the graft-union above the surface of the soil.
- If the scion touches the soil, you open the plant up to soil-borne disease

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VIDEO

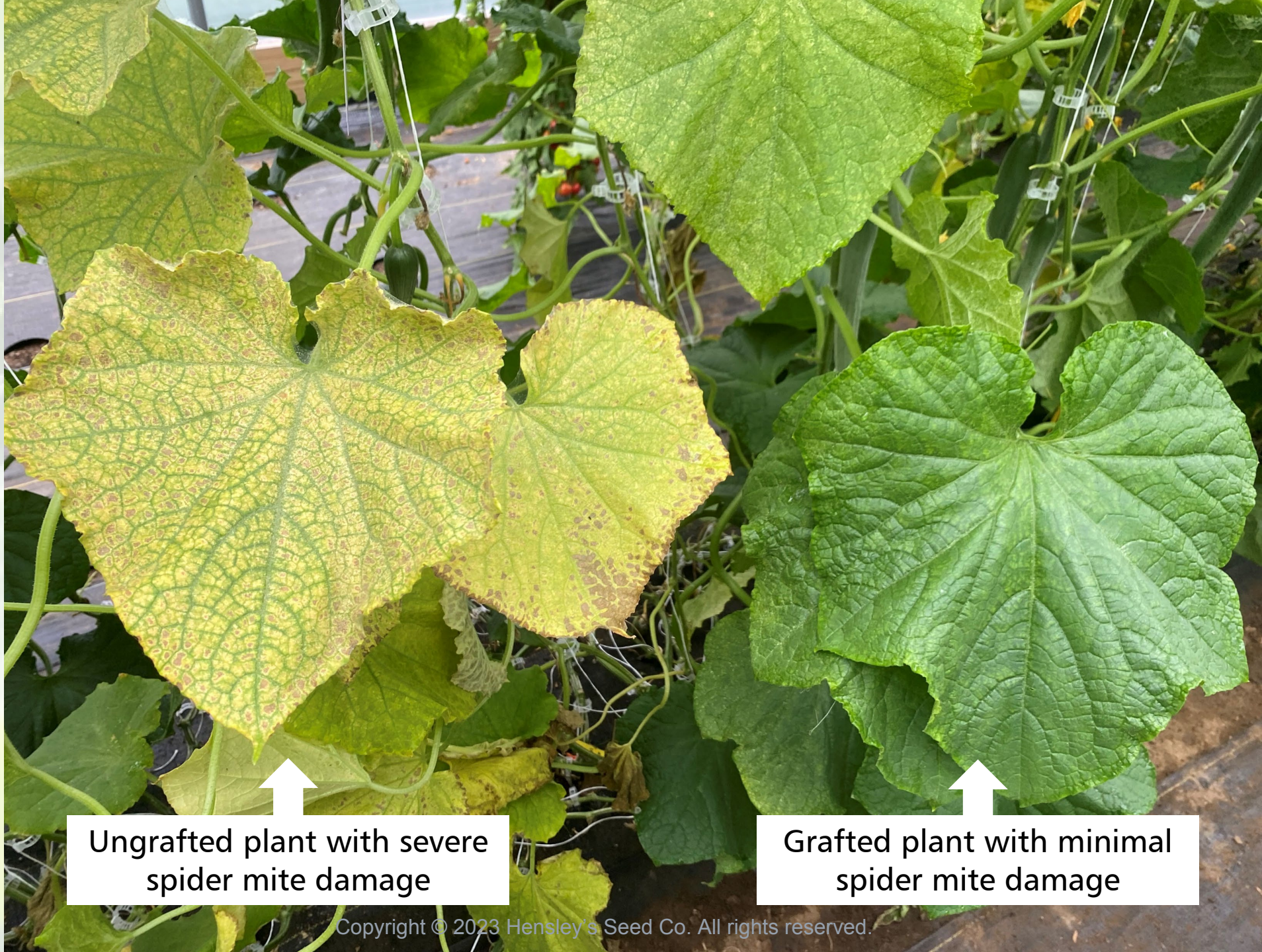
The Grafting Trial at the original research farm

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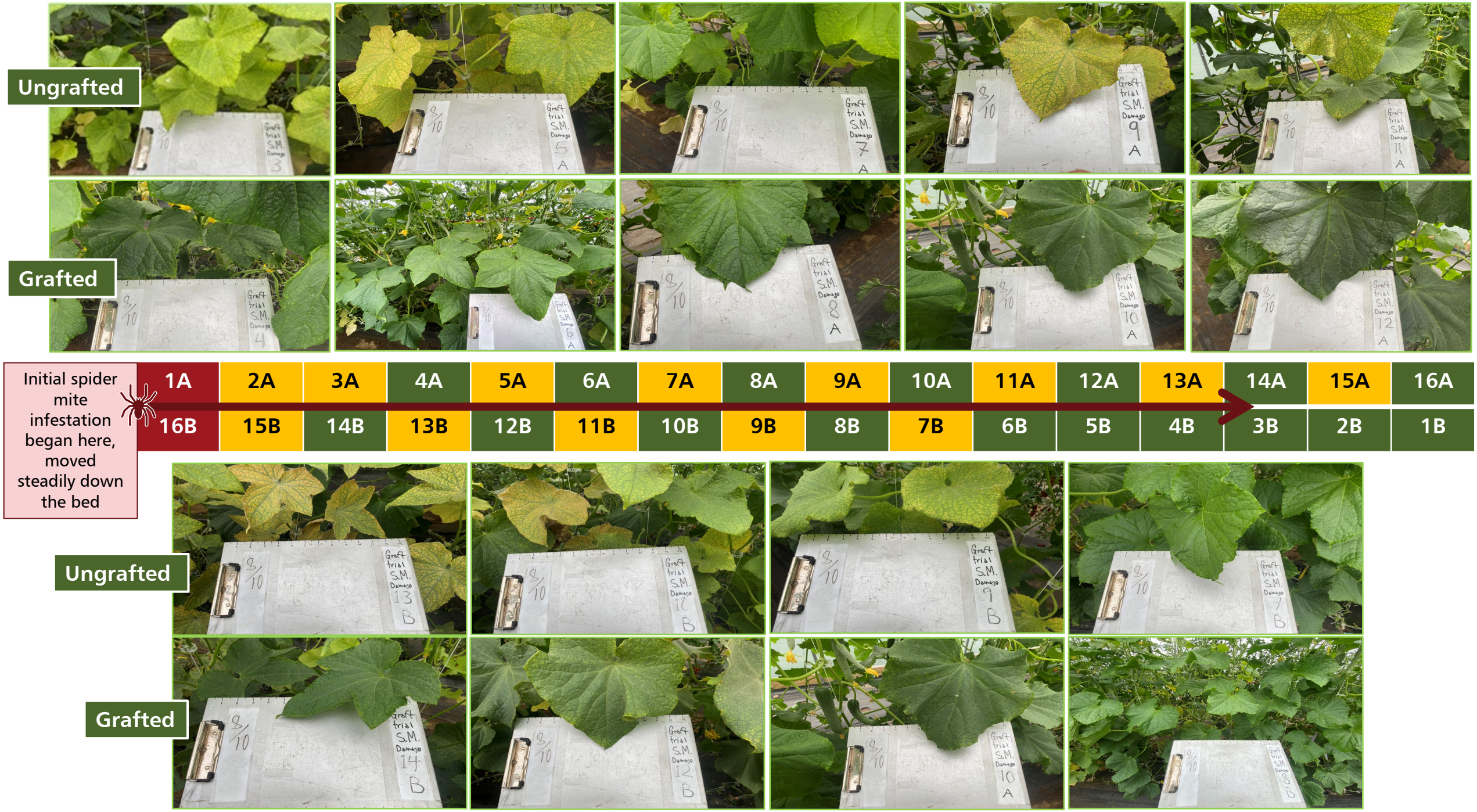
Grafting and Two-Spotted Spider Mite

In the 2022 grafted cucumber trial, we saw an additional benefit:

- Plants grafted to Tetsukabuto were virtually untouched by an infestation of two-spotted spider mites
- In contrast, those ungrafted “control” plants of the same scion variety, *planted right next* to the grafted plants, were severely damaged



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What Can Go Wrong?

What other issues can you encounter with grafted plants?

Carpal Separation or "Hollow-Heart"

- Fruit growth rate too fast
- Variety-dependent
- Manipulating growing conditions can help

Poor Flavor

- Some squash rootstock can impart off-flavors to the fruit
- Variety-dependent





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Resources

Cucumber Grafting: Advantages, Materials, Technique [article]

Original-source Cucumber Library

Original-source Grafting Library

Vegetable Grafting Research-Based Information Portal

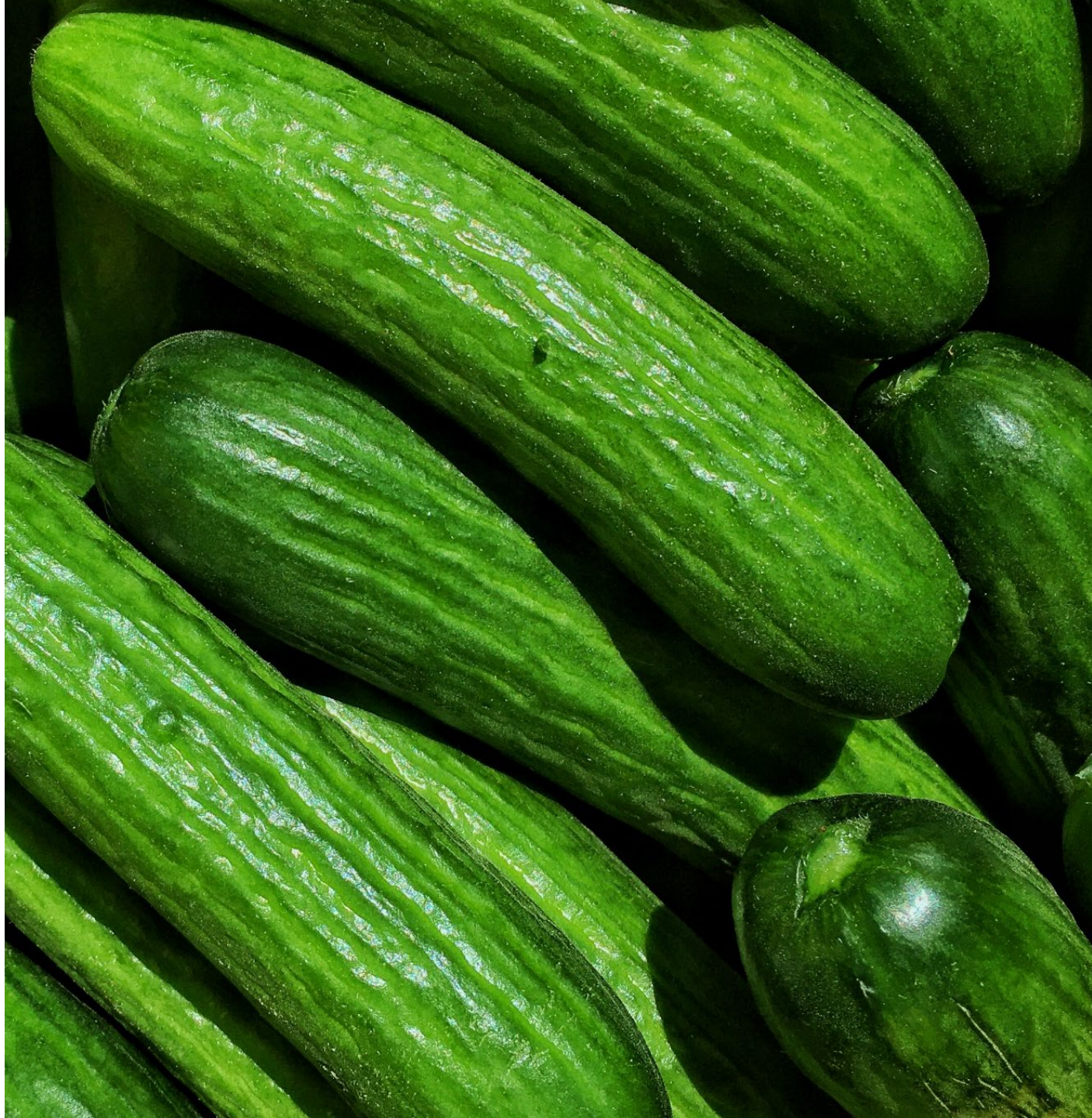
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THANK YOU

FOR JOINING US

A recording of this webinar and the presentation slides will be available on March 13, 2023.

Growing resources



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