Propagation & Growth of Chokecherry

UtahState University UNDERGRADUATE RESEARCH

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Utah fruit growers have shown interest in chokecherry (*Prunus virginiana*) as an alternative crop that has low requirements for water and soil fertility. Currently, the limiting factor in developing a chokecherry industry in Utah is the ability to propagate large numbers of plants for orchard establishment. Chokecherries are difficult to propagate by traditional means because of their low rooting percentages. Plant numbers can be increased in tissue culture but methods are lacking for efficiently inducing roots and acclimating tissue culture plantlets. We are also working on other propagation methods including mound layering, a technique currently used to propagate apple rootstocks. Finding the most efficient propagation method for chokecherry will overcome the last hurdle in developing a new fruit crop uniquely adapted to Utah.

WHY CHOKECHERRIES?

- Drought tolerance
- Cold hardy
- Adapted to alkaline soils
- Potential health benefits of the fruit.
- Local demand for fruit
- Established industry for harvesting and processing.

Figure 1. Chokecherry growing in the wild in the Intermountain West.

Needs:

1. Fruiting varieties suitable for mechanical harvest and production.
   - Compact growth habit.
   - Precociousness.
2. An efficient method of propagation in order to begin large scale production.
3. Optimized mechanical harvesting techniques.

Figure 2. Chokecherry Jelly made from wild chokecherries collected in the Central Utah Mountains. Produced by local business, South Ridge Farms.

OVERCOMING BUD DORMANCY

Problem: A terminal bud is set on seedlings after a short growth period, interfering with large-scale propagation.

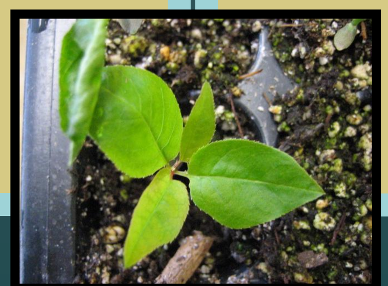
Objective: Determine the optimum chilling time to overcome bud dormancy

- Maximum budbreak
- Optimum shoot elongation

Conclusions

- Response to chilling treatments differed among seedling populations, suggesting genetic variation in chilling requirement.
- Chilling time to budbreak was not correlated with latitude or elevation of origin.
- The effect of chilling time on terminal shoot elongation also differed among seedling populations.
- Chilling requirements for budbreak and terminal shoot elongation were not closely correlated.

Figure 3 – The effect of chilling time on plant growth characteristics of two seedling populations of chokecherry, representing short (6022) and long (6012) chilling requirements.



PROPAGATION

We are developing methods to commercially propagate promising selections.

- Growing seedlings in the field and selecting for desirable characteristics.

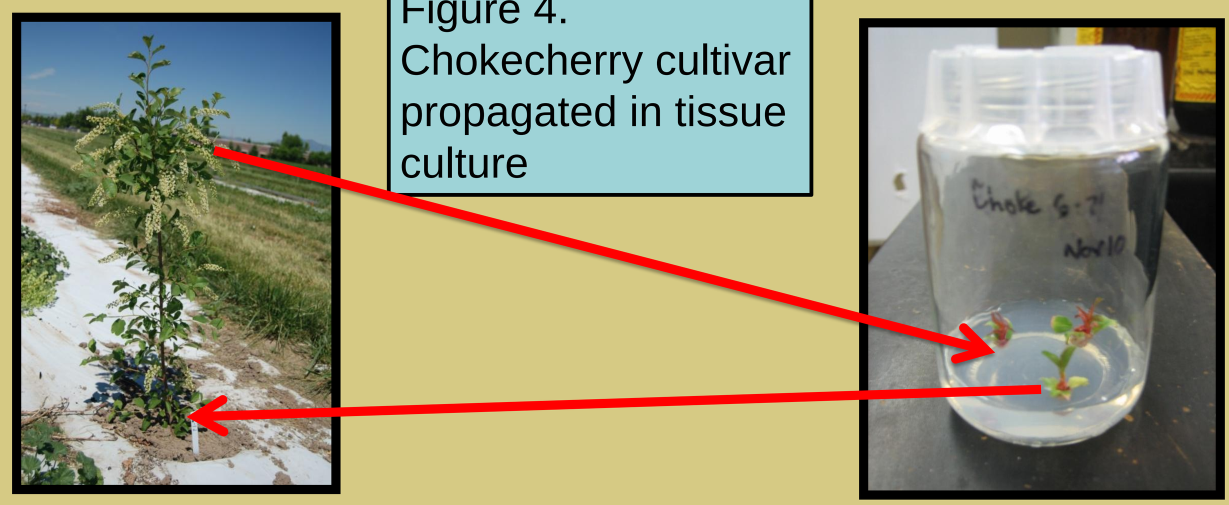


Figure 4. Chokecherry cultivar propagated in tissue culture

- Developing efficient clonal propagation techniques for commercial propagation.
- Chokecherries are being grown in tissue culture (*in vitro*) to mass produce plants.
  - Media components are being tested and compared for optimal shoot development .
  - Hormone levels in the media affect the plant's ability to root for transplanting into soil.

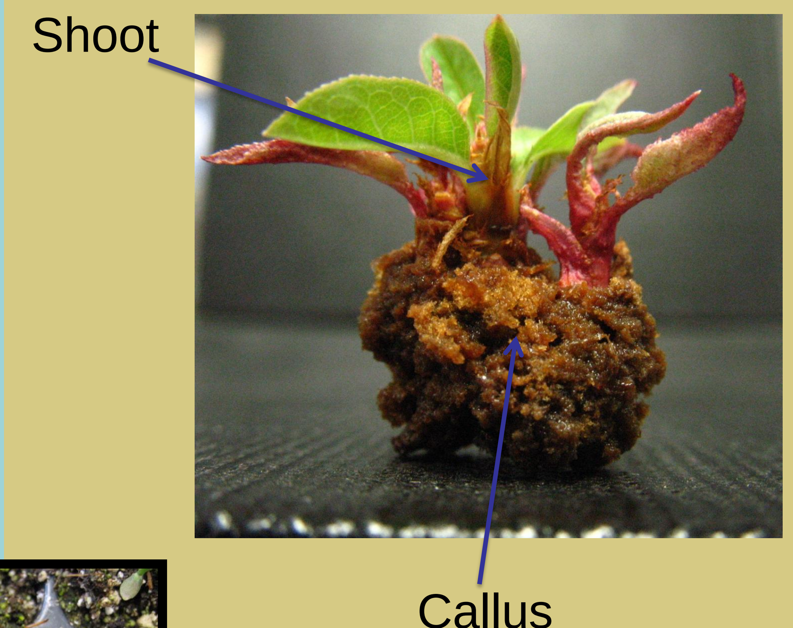
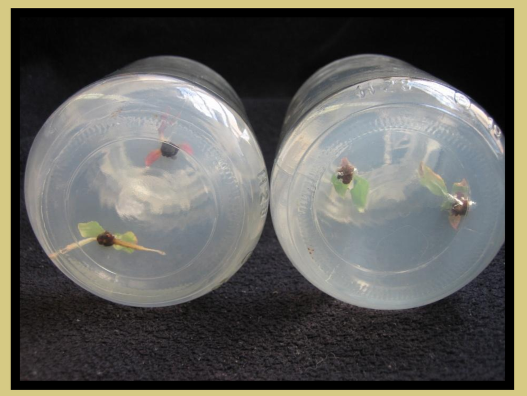


Figure 5. Plants grown in Tissue Culture.



FUTURE PROJECTS

- Determine optimal tissue culture rooting protocol.
- Determine the optimal environmental conditions for continued growth after culture.
- Develop mechanical harvesting methods and processing opportunities.

Figure 6. Existing mechanical harvest technology includes tart cherry harvester (Santaquin, UT) and a raspberry harvester (Laketown, UT)

Acknowledgments

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