



Grafted vs Seedling Chinese Chestnut Trees for Orchard Production

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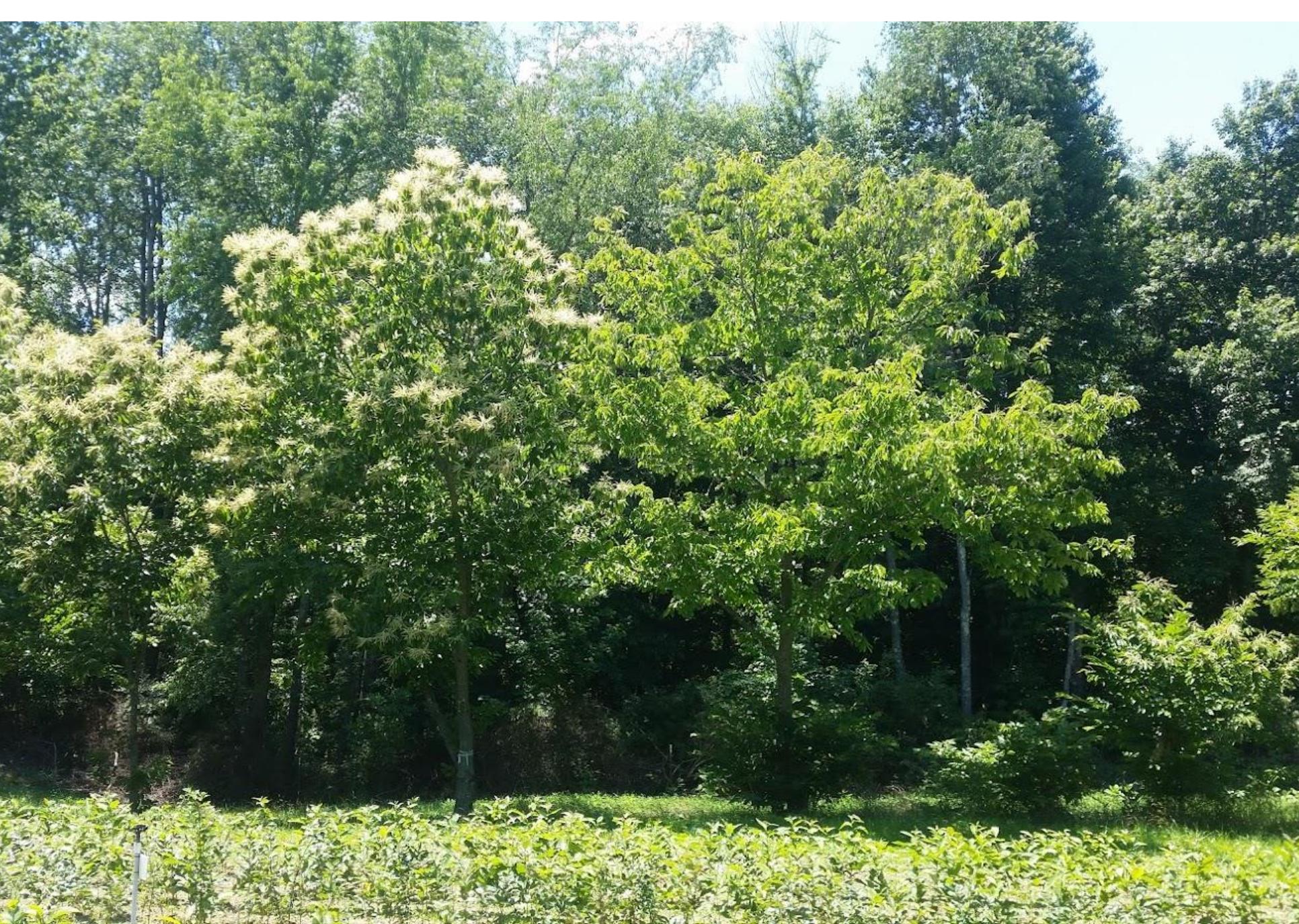


Chinese chestnuts are notoriously problematic to graft, often exhibiting delayed graft failure some weeks to years after initial graft success.





















- The problem seems to be worse for Chinese chestnuts than other chestnut species.
- However, a reasonably large percentage of grafted Chinese chestnut trees are normal-looking, long-lived, and have invisible graft unions



- The failure rate is quite variable, due to many factors.
- A general principle seems to be that stress leads to higher rates of graft failure, esp water stress and cold stress. Good care = better success.



Basic question: For commercial production is it better to put up with graft problems or put up with seedling problems?



Seedling Problems

- Genetic variability and unpredictability
- Longer preproductive period



Current Situation

- Strong opinions and recommendations both ways
- Little supporting data



2013 Planting

- Alternating rows of grafted and seedling trees
- Spaced 12 m between rows; 8 m within rows (39 x 26 ft)
- Including 2 rows of Peach/Qing full sibs adjacent to a grafted row of each parent







PEACH



R11 T16



QING



PEACH



R11 T17



QING

		lb/tree	lb/tree	lb/tree
	N	Mean	range	top 50%
Peach	16	4		
Qing	18	17		
PQ F1	40	22	1 to 61	35



Results

- Seedlings grow faster and survive better than grafted trees.
- Nut quality and nut size from seedling trees ranged from better than to worse than grafts, but mostly comparable.
- Average yield from seedling trees substantially exceeded that from grafted trees.
- The top 50% of seedling trees substantially out-performed the grafted trees in quality and yield.



Recommendations

- For production orchards, plant seedlings from superior parents, representing broad genetic diversity.
- Use grafting for seed orchards.
- Plant orchards at double density (or more) to allow culling of poor performers.
- Evaluate and select the best orchard trees for the next generation of seedlings.



Epilogue

- This is not a definitive study.
- I invite further study and comparisons.
- These recommendations apply only to Chinese chestnut orchards; it's different for other chestnut species and certainly other nut species.
- Chinese chestnuts remain the best chestnut species in both consumer preference and adaptation to eastern North America



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