



Chestnuts are Coming Back

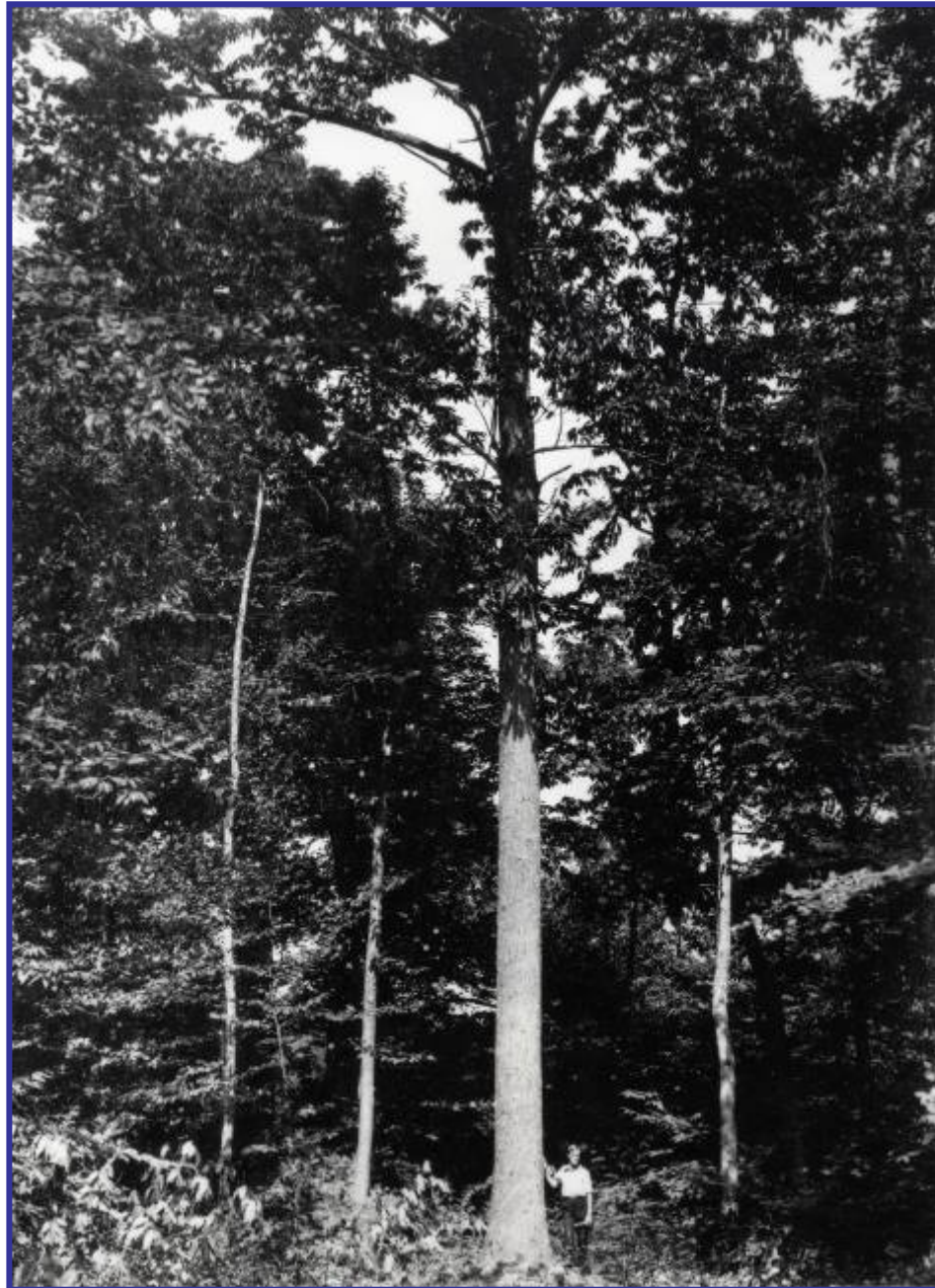
Dr. Sandra L. Anagnostakis

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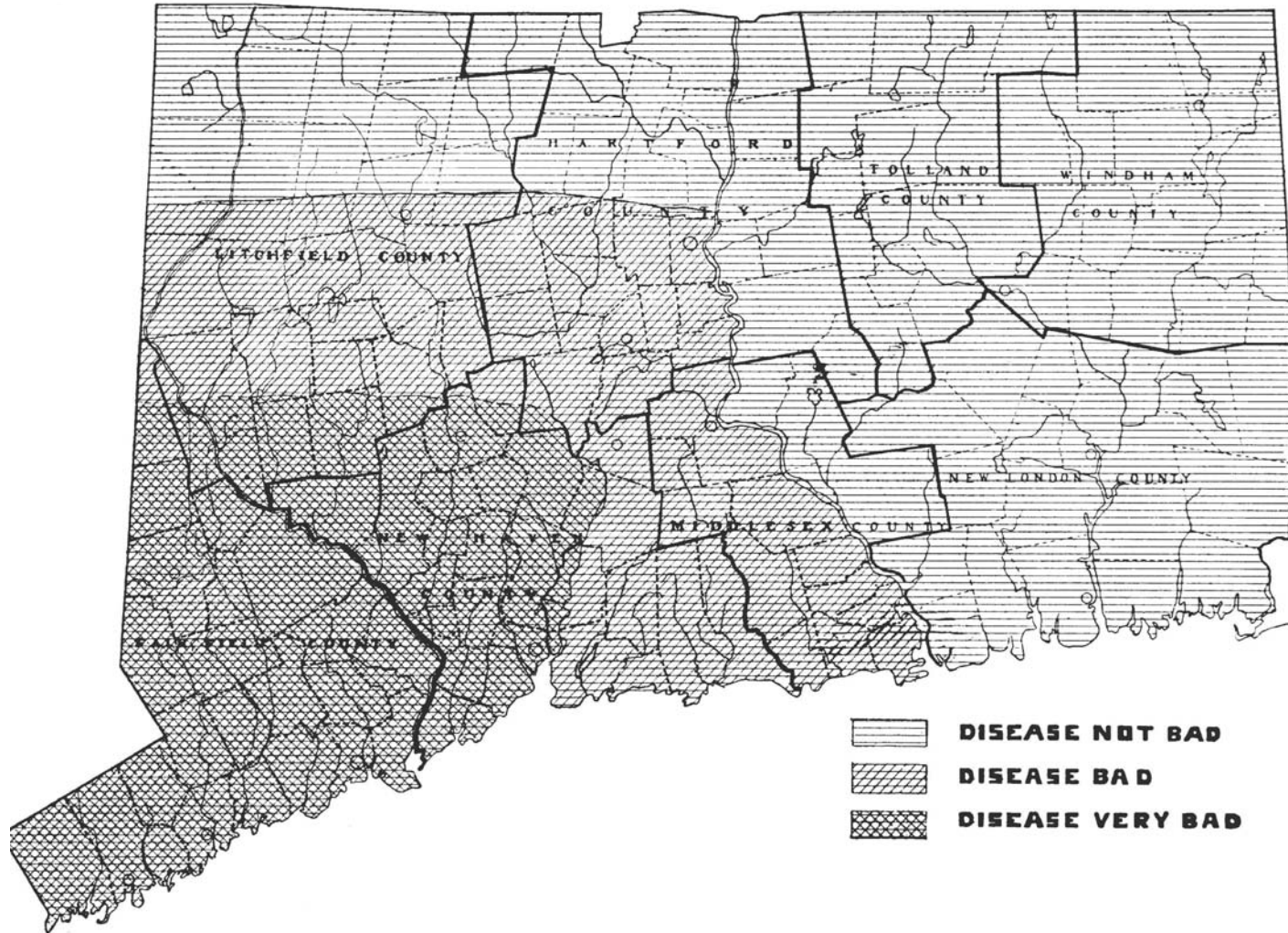
The Connecticut Agricultural Experiment Station



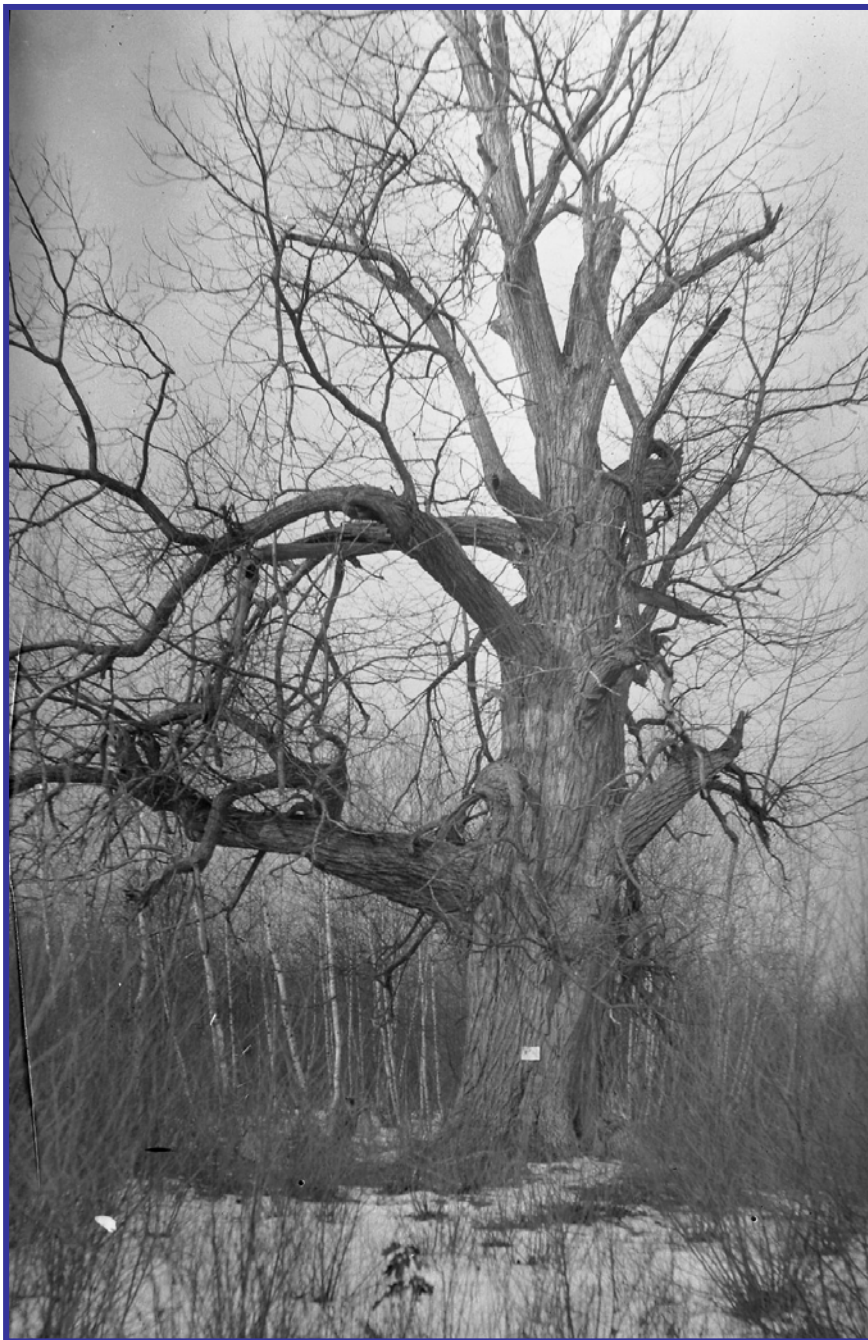
American chestnut in Scotland, CT in 1905



Blight in CT in 1913



Pomfret, CT 1915



Breeding Trees for Resistance

- **CAES had been breeding chestnut trees since 1930.**
- **Arthur Graves and Donald Jones**
 - **Hans Nienstaedt**
 - **Richard Jaynes**



Early CAES Hybrids



Timber tree 'Sleeping Giant'

Orchard tree 'Lockwood'



Help from a Biological Control

- **Hypovirulent strains imported from France in 1972.**
- **Test orchard of American chestnut trees shows that the biocontrol can keep them alive.**



American Chestnuts planted 1976



Not All the Same



Breeding Plan

- **Cross trees with the form that you want (timber or orchard) with trees resistant to disease.**



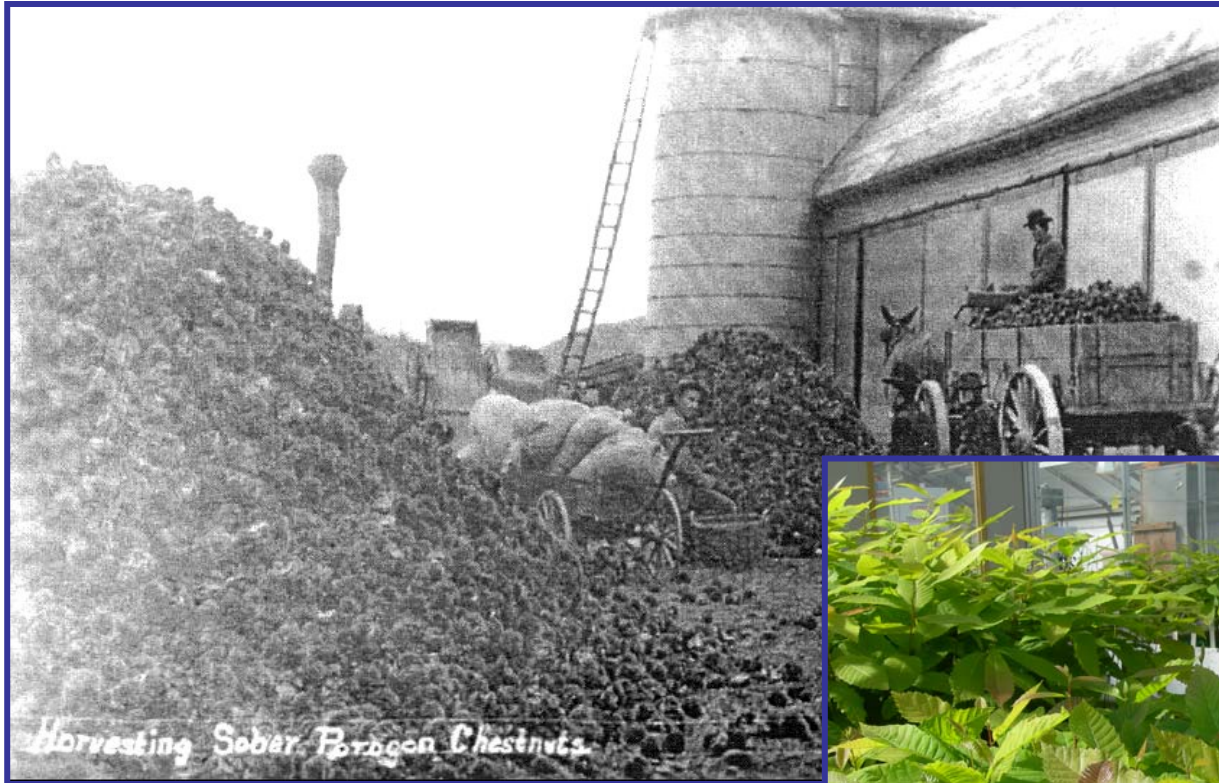
Chestnut Tree Flowers



Making Crosses



Harvest, Store, and Plant in Greenhouse



- **Plant the seedlings outside, and select those that have the desired form.**
- **Further select for resistance to disease.**



New Hybrids, Farm center



Back-Cross Breeding

- Begun 1989

Japanese X American



F1 Hybrid X American



BC1 Hybrid X American



BC2 Hybrid X American



BC3 Hybrid



How Many of the Genes are “American”

- **F1** **50% American**
- **BC1** **75% American**
- **BC2** **87.5% American**
- **BC3** **93.8% American**



BC3 Chestnut Trees 11 years old



Next cross resistant BC3's with each other

BC3 X BC3



**1 out of 64 fully resistant,
93.8% American genes**



- **Plant a *Seed Orchard* to provide seedlings for the forests of Connecticut.**



Griswold Research Center

Formerly Pachaug State
Nursery



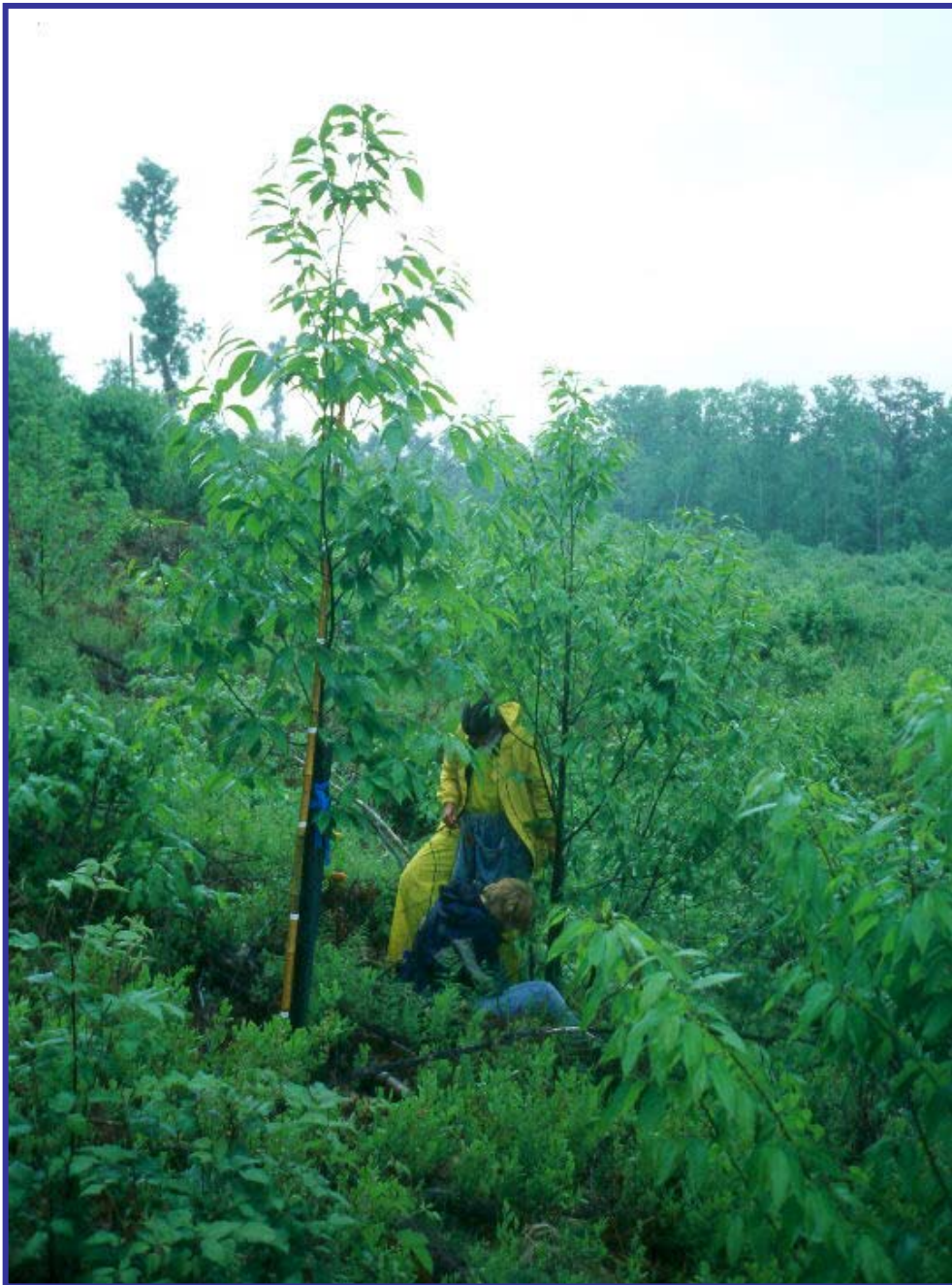
Photo from Microsoft Virtual Earth



Combine Biocontrol and Breeding

- **Plant new resistant timber trees in places where timber has been harvested and native chestnuts are sprouting.**
- **Treat native chestnuts with the biocontrol to keep them alive.**





Sessions Woods Burlington, CT



- **They will cross with each other and the next generation of chestnuts will have the resistance from the planted trees and all the diversity that evolved in that place.**





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