

Revision to Planting Mother Trees for **Two-Tree Orchards**

We need to plant mother trees now so we can produce blight resistant nuts as quickly as possible after our blight resistant tree is approved for release.

There are several items that control how and why this is needed and done.

- **First is the fact that American chestnut trees are self-sterile so they need another tree for pollination to produce viable nuts.**
- **Second is the fact that we do not want to plant two of the blight resistant trees adjacent to each other as the resulting nuts will be inbred. Therefore, initially we want to cross the blight resistant trees with nonresistant (also called wild type) trees to get good genetic diversity for the long range health of the American chestnut.**
- **Third, with good sunlight an American chestnut will usually produce male catkins and pollen in about 5 years, but usually start producing female flowers, or burs, only after about 8 years. If planted in the forest it may take 30 years for a tree to flower.**
- **Fourth, in order to have “mother” trees producing female flowers by the time the blight resistant trees start to produce pollen, they will need a “head start”.**
- **Fifth, if two or more non-resistant “mother” trees are growing close together, and producing pollen, they will mostly pollinate each other and few or none of the resulting nuts will have been pollinated by the smaller and younger blight resistant tree.**
- **Sixth is the fact that we expect to have our blight resistant tree approved for release to the public in 3 to 5 years.**
- **Finally, our recommendation now is to plant 3-5 mother trees in small orchards spaced 15’ apart, with orchards 2-300 yards apart. Then when your blight resistant tree gets big enough to produce pollen you will need to trim back all the mother trees that are producing pollen, except one and collect nuts from the mother tree. When your blight resistant tree gets big enough to produce burs and nuts you can then let all the mother**

trees grow and produce pollen and collect nuts from your blight resistant tree.

- I am now also recommending that you plant several isolated mother trees where the orchard mother trees will not pollinate them. Then when your transgenic tree starts to produce pollen, you can remove some catkins and hand pollinate any flowering isolated trees without bagging or removing any catkins. And you could also graft a piece of your transgenic tree into the top of the isolated trees for a permanent pollinator.
 - Later, when the transgenic tree in the original orchard starts to produce nuts you would just collect the nuts from that tree, and never have to bag flowers, remove any catkins or cut back any of the mother trees.
 - If you have the area you can also plant a long row of trees spaced about 15' apart. When the transgenic tree is available, cut down every other tree and graft a piece of blight resistant material onto the stump of the ones you cut down. That would give a long row of trees with every other one a wild type mother tree and the rest all being grafted trees that would all be clones. The clones will not pollinate each other and the closest tree to every wild type tree will be a blight resistant tree. Therefore most of the nuts from the wild type trees will be pollinated by the close blight resistant tree and all of the fertile nuts from the blight resistant trees will have been pollinated by one of the mother trees.
 - One advantage is that scions grafted onto established root systems can reach maturity, producing nuts, within three to four years versus seven to ten years for a nut to grow into a nut-producing tree.
-