

**Progress report - year 1
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Title: Defining methods for reintroducing American chestnut to oak-hickory forests of the Allegheny Plateau

Principal Investigators

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Study summary

This study will examine the establishment success of BC₃F₃ hybrid American chestnut seed and seedlings planted on the Allegheny National Forest following each of three cuts of a three-stage shelterwood sequence commonly used to regenerate oak on the Allegheny Plateau of western Pennsylvania. The shelterwood sequence involves a preparatory cut (prep-cut), which reduces a fully-stocked stand to approximately 70 percent relative density in order to improve light conditions for establishment of new oak seedlings. Once the oak regeneration on site has developed an average root collar diameter of one-quarter inch, a shelterwood cut is implemented, which will leave about 50 percent relative density. Finally, once oak seedlings are three feet in height on average, an overstory removal cut will occur, removing most of the residual trees and releasing the developed regeneration to full sunlight. The results of this study will help refine our understanding of the growth, survival, and competitive ability of chestnut planted across a gradient of light and competition intensities. This information will help managers incorporate chestnut reintroduction into oak regeneration management activities.

Progress to date

Chestnut seedlings: TACF donated 2000 seeds from five BC₃F₃ families (D3-27-46, D5-28-88, W2-21-29, W4-32-87, and W5-12-148) for the use in this study. The seeds were hand planted at the Vallonia Nursery in Vallonia, Indiana on November 13, 2015 (Fig. A). A tally in late August, 2016 showed about 65% germination success of the seedlings (Fig. B.).

Site selection: We had originally planned on using four sites per treatment for this study. However, only three suitable sites per treatment were available. Between June and November, 2016, three prep-cut sites (Fig. C) three shelterwood sites (Fig. D) and three overstory removal sites (Fig. E) on the Allegheny National Forest (ANF) were selected for this study. These nine sites, selected from a larger pool of sites, were chosen based on year of treatment (between 2014 and 2016), similarity of density and height of competing vegetation within treatments, and ease of access. The chestnut seedlings will be lifted in March, 2017, characterized for size and phenotype, and planted in an experimental design in April, 2017.

Outreach: We have recruited high school science classes from the Tidioute Charter School, in Tidioute, PA, to help plant and monitor the chestnuts.



Figures: **A.** Sowing the chestnut seed at Vallonia nursery (11/15), **B.** tallying seedlings at Vallonia nursery (8/16), **C.** one of three pre-cut sites (11/16), **D.** one of three shelterwood sites (6/16), **E.** and one of three overstory removal sites (6/16).

