



## WATER RESOURCES RESEARCH GRANT PROPOSAL

**Project ID:** 2002AZ4B

**Title:** The effect of mycorrhizae on competitive ability and drought tolerance of cottonwood (*Populus fremontii*) and saltcedar (*Tamarix ramosissima*)

**Project Type:** Research

**Focus Categories:** Ecology, Wetlands, Drought

**Keywords:** mycorrhizae, soil microbiology, restoration, competition, drought, *Populus fremontii*

**Start Date:** 03/01/2002

**End Date:** 02/28/2003

**Federal Funds:** \$9,017

**Non-Federal Matching Funds:** \$26,098

**Congressional District:** 1

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**Abstract**

This study investigates the effects of mycorrhizal fungi on growth and competitive ability of Fremont cottonwood and saltcedar, under drought and non-drought conditions. By monitoring growth, productivity, and survivorship of seedlings grown with and without fungi, we will determine the importance of mycorrhizae to the survival and recovery of cottonwood forests. The results of this project will benefit restorationists and riparian site managers by putting another tool in their restoration tool box: They will know whether addition of fungal symbionts is necessary for aiding in natural recovery of the native cottonwood forests. This will be useful for managers dealing with riparian sites such as those along the Lower San Pedro River, where reductions in ground water pumpage are expected to increase downstream stream flow rates, and could result in a decline in cottonwood densities and an invasion of saltcedar.

Results from this study will also increase chances of restoration success at the many sites in Southwest at which more active restoration interventions are being undertaken. There are many on-going and planned cottonwood-willow planting projects in the Southwest, include several Army Corps of Engineer funded projects on the Salt, Gila and Santa Cruz Rivers, and US Fish and Wildlife funded projects along the Lower Colorado and Rio Grande. At these and other degraded river sites, cottonwoods are being planted as poles or nursery grown plants, or seeded into the area following at least partial restoration of a natural flow regime. Stakeholders at these and other sites could use information from our study as a basis for deciding whether to inoculate their tree plantings or the soils of their restoration site with specifically identified types of mycorrhizal fungi to increase transplant survival.