ABSTRACT

TITLE:	Arbuscular and Ecto-Mycorrhizal Propagule Densities in Various Levels of Sudden Aspen Decline in Southwest Colorado
AUTHOR(S):	Cumbie, Brooke ; Korb, Julie
PRESENTED AT:	6th Annual Natural & Behavioral Sciences Undergraduate Research Symposium Program, Fort Lewis College, 2011

ABSTRACT: Sudden aspen decline (SAD) is rapid mortality that results in the loss of whole aspen (Populus tremuloides) stands. Southwestern Colorado has the greatest occurrence of SAD in the state. The purpose of our study was to look at mycorrhizal associations in different levels of SAD. We conducted our study June-September 2010. Our study plots were located in the Dolores Ranger District of the San Juan National Forest in Southwestern Colorado. We quantified aspen forest stand characteristics, which include tree canopy cover, tree density, basal area, shrub cover, pathogens present, and tree regeneration, for three levels of SAD (categorized by percent canopy cover low 0-30%, moderate 30.1-70%, and high 70.1-100%). We also quantified arbuscular (AM) and ecto-mycorrhizae (ECM) root colonization across the levels of SAD and determined correlations between AM and ECM root colonization and aspen forest stand characteristics. The main findings were a higher abundance of ECM and AM in low (healthy) SAD plots. Significant correlations found were between AM and tree density, along with basal area. ECM was significantly correlated with tree density and with tree canopy cover. The low abundance of mycorrhizae colonizing roots in high SAD plots could cause a shift in the aspen understory plant communities by allowing invasive plant species, which are generally non-mycorrhizal, to establish. Higher densities of AM and ECM propagules in the low (healthy) SAD stands make plants more drought tolerant by having increased uptake of water and nutrients and less susceptibility to pathogens, making them more resilient to climate induced dieback and changes.