

P2.2 EFFECTS OF FIRE AND SOIL CONDITIONS ON GERMINATION AND SEEDLING SUCCESS OF DIFFUSE KNAPWEED (*CENTAUREA DIFFUSA*) IN NORTHERN ARIZONA FORESTS

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We hypothesized that diffuse knapweed (*Centaurea diffusa*) germination and seedling growth respond positively to fire in ponderosa pine forests. We are the first to address this hypothesis in pine forests of the Southwestern US. With an increase in the size and number of high severity wildfires in the Southwest, we believe diffuse knapweed may increase, leading to reduced forage and land values, and major ecosystem changes.

We used both controlled ex situ pot experiments and field comparisons. We obtained large intact soil cores from two forest conditions, severely burned and unburned, from the Coconino National Forest, near Flagstaff, Arizona. We planted knapweed seeds in pots with severely burned and unburned soils, allowed native plant competitors to grow in half, and clipped competition in the other half. Pots were exposed to natural weather conditions on the grounds of the Rocky Mountain Research Station Greenhouse Facility. Preliminary measurements showed that diffuse knapweed dry weight was greater in burned soil versus unburned soil. Several diffuse knapweed plants bolted, flowered, and produced seed heads, and all these plants were in the severely burned soil. A combination of drought and high temperature conditions likely affected the success of native competitors and many died prior to harvest of knapweed plants.

For the field experiment, we planted knapweed seeds in sealed nylon packets in four forest floor conditions on the Coconino National Forest: severely burned, moderately burned, unburned with litter removed, and unburned with litter intact. We removed seed packets every month for 9 months and measured germination. Germination percentage was higher under the severely burned condition than under the other conditions. Overall, these preliminary results suggest that severe fire may promote germination and seedling success of diffuse knapweed in northern Arizona ponderosa pine forests.

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