

SOIL CARBON MANIPULATION FOR CONTROL OF ANNUAL WEEDS

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Annual weeds that proliferate following wildfires dominate millions of hectares of rangeland in the western United States. Revegetation with native perennial plants is not feasible in these areas without some form of weed control. Carbon application in the form of sucrose has been shown to suppress annual weeds by temporary immobilization of nitrogen in the soil profile. Our objective was to assess the efficacy of sucrose for annual weed suppression under a wide range of treatment applications in multiple years. The study was conducted on an area in the Snake River Birds of Prey National Conservation Area that burned in 1997. Sucrose was applied in either early December or in both December and February at 0, 200, 400, 600, 800, 1000, 1200, 1600, or 2000 total kg-C ha⁻¹. In the first 2 years of this 3-year study, the maximum carbon treatment resulted in a >75% reduction in biomass production of the 2 main weed species, cheatgrass (*Bromus tectorum*) and tumble mustard (*Sisymbrium altissimum*). For the same total amount of sucrose, a single application in December was more effective than the December/February application. Application rates necessary for adequate weed control are probably not economical for broad-scale application after wildfire. Use of sucrose as a carbon source may still be feasible for some high-intensity, small-area applications and in areas where herbicide use is not acceptable.