Sunflower's Impact on Soil Recovery and Native Grass Growth

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Fire, caused by the combustion of flammable material and characterized by heat, flames, and often smoke, can profoundly affect soil properties and nutrient availability. Its impact on soil fertility depends largely on intensity. This was evident in the spring of 2024 in West Texas during the Panhandle wildfires which impacted over 50 counties and more than 1 million acres of land. The purpose of this project was to assess the impact sunflowers had on native grass germination and soil fertility following fire exposure. Loam soil samples were subjected to two heat intensities for ten minutes. Nutrients and pH levels were analyzed before planting, after sunflower germination, and after grass seed germination. Fifteen sunflower seeds were planted in pans containing the control, low-heat, and high-heat soils. Germination rates and plant height were recorded over 22-days. Buffalo grass and blue grama grass seeds were planted in six pans containing the control with sunflowers, low-heat with sunflowers, high-heat with sunflowers, control, low-heat, and high-heat and germination rates recorded over a 12-day period. The hypothesis was supported and sunflowers proved to have a positive impact on high heat soil, neutralizing soil alkalinity, and improving grass growth with buffalo grass germinating at 100% and blue grama at 82%. Native grass seeds in high heat soil germinated on day 4 and 50% by germination by day 6. This research is particularly important with the increasing frequency of wildfires in West Texas and surrounding states affecting soil structure and function, crop and forage availability, and ecosystem sustainability.

Awards Won:
Arizona State University: Arizona State University ISEF Scholarship (valued at up to $32,000 each)