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Improving reseeding success after catastrophic wildfire with surfactant seed coating technology

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The application of soil surfactants in wildfire-affected ecosystems has been limited due to logistical and economic constraints associated with the standard practice of using large quantities of irrigation water as the surfactant carrier. We tested a potential solution to this problem that uses seed coating technology to harness the seed as the carrier. Through this approach, precipitation transfers the surfactant from the seed into the soil where it can work to ameliorate water repellency within the seed microsite. We evaluated this technology within a burned, highly water repellent, piñon-juniper woodland. Within a randomized complete block design, we separately seeded two bunchgrass species (Indian ricegrass and crested wheatgrass), whose seeds were left either uncoated or coated with a surfactant blend of alkylpolyglycoside and ethylene oxide/propylene oxide block copolymer. Plots were monitored through two growing seasons. In the spring after seeding, plant density and cover in the surfactant coated treatments were 222% and 215% higher than the uncoated treatments, respectively. Two years after seeding, differences in plant density between the treatments decreased slightly, with the surfactant coating having 183% higher density, as compared to the uncoated treatment. Over this same period, relative differences in cover between the treatments had increased, with surfactant coating having 244% higher cover than the uncoated treatment. Overall, the results of this study demonstrate the ability of surfactant seed coating technology to improve seedling emergence and establishment. Future research is merited for evaluating the technology at larger-scales and within different ecosystems.