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Mulching and Soil Depressions for Revegetation of Oil and Gas Wells in Arid Ecosystems

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Surface mulching and soil depressions (e.g., pitting) have long been tools for ecosystem restoration. Although these techniques can improve plant establishment, they are not commonly used in oil and gas well pad reclamation, and in cases where they have been used, their effects have varied due to treatment and site factors. To better understand the application of these techniques, we first performed a review of scientific literature related to oil and gas reclamation practices in the intermountain west, which revealed that only 9% of studies evaluated mulching and 3% soil shaping/depressions. Second, we performed field studies on oil and gas wellpads in the Uinta Basin, UT, in cooperation with federal agencies (BLM, USFWS) and industry practitioners. At six locations representing a spectrum of plant community types, we compared the outcome of seeding in plots receiving surface mulching, soil depressions, artificial plant shelters, or no treatments. Regardless of seedmix or site, both mulching and soil depressions (but not shelters) increased plant density in all years except those with extremely low precipitation. Whether seeded plants benefitted more from mulching or soil depressions varied by site and year, but when used together, the effect of these tactics were additive. At several locations, mulching resulted in fewer non-native weedy species than did soil depressions, and it proved more beneficial than integrated compost where they were tested side by side at one site. In a comparison of inexpensive, locally-sourced woodchips to commercial cedar mulch, we found that the benefits of both products were equal, suggesting that affordable, effective mulch options may be readily available. This research provides new evidence that both surface mulching and soil depressions can benefit plant establishment for oil and gas reclamation in the arid west.

Keywords: mulch, pitting, revegetation