

Evaluating Sagebrush Establishment Techniques on Reclaimed Bentonite Lands in Wyoming's Big Horn Basin

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Historic sagebrush reestablishment attempts on bentonite reclamation in Wyoming's Big Horn Basin have not reestablished sagebrush habitat in pre-mine amounts. This reduced habitat has impacted obligate species such as sage-grouse. This study investigated utilization of several sagebrush establishment techniques on reclaimed bentonite mines during the 2007 and 2008 growing seasons. Efforts in 2007 examined gravity-fed, drip-irrigation systems for supplemental watering of sagebrush bare-rootstock transplants on three sites. Supplemental water was periodically applied from June-September. Several hundred sagebrush tublings of two size classes (four and ten inch) were transplanted at each site. Two thirds were drip-irrigated, 1/3 were not. At two sites, irrigated ten inch seedlings averaged 70% first season survival; four inch tublings averaged 35%. The third site and all three non-watered controls had no survivors of either size. Efforts in 2008 included treating sagebrush transplants with supplemental quart size, cellulose-based watering gel (Rainbird®) and granular form cellulose-based supplements (Zeba®). Transplants were protected with coconut mats for moisture conservation and weed control. Tublings were given up to ½ gallon of supplemental water at planting. Additional areas were hand-broadcasted with Zeba® treated sagebrush seed (1.5 to 8 PLS pounds/acre). Mycorrhizal inoculant and granular Zeba® were concurrently hand-broadcasted with treated sagebrush seed at nominal rates of approximately 40-60 bulk pounds/acre, each. Areas were lightly hand-raked. First season transplant survival rates for gel-treated tublings ranged from 58% to 85% (average 74%). Areas broadcasted with treated seeds averaged 24 sagebrush seedlings/ft². Subsequent observations indicate substantial reductions in first-season survival rates.