

Biological and Ecological Aspects of Big Sagebrush Subspecies: Influences on planting success and community restoration

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Efforts to restore big sagebrush (*Artemisia tridentata*) communities require the identification of the species and subspecies of sagebrush encountered and characterization of the ecological conditions of the environment in which the project is located. Populations of big sagebrush display close alliance to certain habitats, yet various species of sagebrush hybridize and form rather broad and important communities. Morphological specialization and adaptations have evolved along environmental gradients. Significant differences in growth occur within and among subspecies indicating adaptations to site of origin. Differences in photosynthetic characteristics also occur among subspecies that correlate with environmental conditions. Seed dormancy and germination patterns are habitat correlated among all three subspecies of big sagebrush. Individual subspecies also exhibit separate strategies to tolerate abiotic stress, produce seeds, complete germination, establish new seedlings, and adjust seasonal growth rates. Multiple ploidy levels occur among the major species of sagebrush, and may facilitate adaption to ecologically extreme conditions. Seed germination characteristic are closely correlated to habitat, and movement of seed from one environment to a different habitat is usually unsuccessful. Sagebrush seeds require specific seedbed conditions, and high mortality results from planting amid unfavorable conditions. Various machines have been developed and modified to effectively plant sagebrush seeds, and the use of specific equipment is critical to planting success. It is important to utilize specific practices to retain a desire amount of the existing shrubs and encourage recruitment of new individuals.