Competitive Dynamics among Crested Wheatgrass and Native Forbs and Grasses

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Extensive monocultures of exotic crested wheatgrass (*Agropyron* spp.) in the interior western United States replaced former wildlife habitat and in many cases are susceptible to or currently invaded by exotic annual grasses and forbs. Approaches are being examined for adding native species to improve diversity and structure of these stands. Residual wheatgrass may, however, interfere with establishment of natives. Our objective was to determine competitive interactions of native grass/forb mixtures with crested wheatgrass. Five species used in this study were the exotic grass Agropyron sibiricum (AGSI), 2 native forbs, Achillea millefolium (ACMI) and Penstemon speciosus (PESP), and 2 native grasses, *Elymus elymoides* (ELEL) and *Poa secunda* (POSE). Treatments were: 1) AGSI (1 plant); 2) AGSI (2); 3) AGSI (1), ELEL, ACMI, PESP; 4) AGSI (2), ELEL, ACMI, PESP; 5) ELEL, ACMI, PESP, 6) AGSI (1), POSE (2), ACMI, PESP; 7) AGCR (2), POSE (2), ACMI, PESP and 8) POSE (2), ACMI, PESP. Ten replicates of treatments were grown in a greenhouse for 5 months. Greatest aboveground biomass was produced by AGSI (2 plants) (39.1 g), AGSI (1), ELEL, ACMI, PESP (37.4 g), and AGSI (1) (34.9 g). AGSI biomass was smaller when grown with any of the native plant combinations (24.7 g) than when grown alone (37.0 g). Treatments with only native plants produced less biomass (20.5 g) than treatments including AGSI (29.3 g). Biomass was twice as great for ELEL and nearly 3 times as great for POSE when grown without AGSI. Forb biomass was generally reduced by 2 AGSI (5.4 g vs 1.4 for ACMI, 0.9 g vs 0.6 g for PESP). Although competitive effects appear reciprocal, the impact on natives underscores the need to provide good wheatgrass control prior to seeding these natives into Siberian wheatgrass monocultures.