

## **Forage Yield Potential Among the Alfalfa Core Collection and Combining Abilities of 18 High Performing Accessions**

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Characterization of plant germplasm repository populations can facilitate their utilization in commercial breeding programs. One hundred and ninety eight accessions from the National Plant Germplasm System's alfalfa core collection were evaluated for forage yield potential at Las Cruces, New Mexico from 1998 through 2000. Accessions with similar fall regrowth were grouped resulting in 3 field nurseries, dormant (0-10cm plant height), semi-dormant (11-20cm plant height), and non-dormant ( $\geq 21$ cm plant height) with each nursery having 88, 68, and 42 accessions, respectively, and check cultivars of similar fall regrowth. In total, 36% (72) alfalfa core collection accessions exhibited forage yield performance which was equivalent to the highest yielding check cultivar in their respective nursery. Forage yield data for all 198 alfalfa core collection accessions will be submitted for inclusion in the Germplasm Resources Information Network's database.

Eighteen high yielding accessions were selected across all 3 fall regrowth nurseries and, therefore, possessed varied fall dormancy response. These accessions were subsequently characterized for genetic parameters using two diallel analyses during 2002 & 2003. Significant general and specific combining ability effects were detected among accessions in both diallel analyses (Bhandari et al., 2007; Al Lawati et al., 2010). Crosses between populations possessing high per se performance and different fall regrowth response had the greatest chances of producing high-yielding hybrids.

Al Lawati, A.H., C.A. Pierce, L.W. Murray, and I.M. Ray. 2010. Combining ability and heterosis for forage yield among elite alfalfa core collection accessions with different fall dormancy responses. *Crop Sci.* 50:150-158.

Bhandari, H.S., C.A. Pierce, L.W. Murray, and I.M. Ray. 2007. Combining abilities and heterosis for forage yield among high-yielding accessions of the alfalfa core collection. *Crop Sci.* 47:665-673.