Registration of AZ-97MEC AND AZ-97MEC-ST
Very Nondormant Alfalfa Germplasm Pools with Increased Shoot Weight and Differential Response to Saline Irrigation

Two alfalfa (Medicago sativa L.) germplasm pools, AZ-97MEC (Reg. no. GP-331, PI 597643) and AZ-97MEC-ST (Reg. no. GP-332, PI 597644), were released in 1997 by the University of Arizona Department of Plant Sciences and the Arizona Agricultural Experiment Station.

AZ-97MEC is a broad-based, very nondormant (fall dormancy rating > 9), composite population adapted to long-season, low-elevation desert environments. It is intended as a source of potentially novel variation for use in alfalfa breeding and research, especially where increased cool-season productivity is desired. AZ-97MEC was formed using 51 2-yr-old plants from Arabian and North African ecotypes grown in a yield trial in Tucson, AZ, between 1987 and 1989 (1). Ecotypes were selected for inclusion in this pool based on multivariate analysis of agronomic and morphological variables from a field evaluation trial of these ecotypes conducted in Tucson (6). Selection of ecotypes and calculation of the contribution of each ecotype to the pool was based on the average distance among ecotypes in cluster analyses (2) with the goal of maximizing genetic diversity within the pool. The ecotypes (for descriptions and sources, see Ref. 5 and 6) included in the study and their approximate contributions were: Ed-Darner (8%), Egypt II (6%), Egypt III (6%), Egypt IV (6%), Egypt V (10%), Gaidun (12%), Hasawi (8%), Hejazi (8%), Hudieba (8%), NE-NAF-1 (10%), NE-NAF-4 (10%), and Qassimi (8%).

AZ-97MEC-ST was derived from two cycles of selection within AZ-97MEC for increased shoot weight under saline and nonsaline irrigation. AZ-97MEC-ST was developed to provide a broad-based source of very nondormant germplasm with the potential for increased forage production under moderate salt stress. Selection in Cycle 1 was based on shoot fresh weight of 448 plants of AZ-97MEC grown using the methods described by Johnson et al. (4). Briefly, plants were irrigated with 80 mM NaCl and individual shoot weights measured for two regrowth harvests. These plants were then grown with nonsaline irrigation and harvested for an additional two regrowth harvests. A total of 56 plants (12.5%) were selected and used to form Cycle 1 Syn-1 seed. In the second cycle, 525 Syn-1 plants were grown and evaluated. Plants (14.3%) were selected and interpollinated by hand to form Cycle 1 Syn-1 seed. A total of 120 Cycle-2 Syn-1 plants were intermated by hand in the greenhouse to produce AZ-97MEC-ST (Cycle 2-Syn-2).

In a greenhouse trial conducted using the conditions used in selection, AZ-97MEC-ST produced mean shoot weights significantly (P < 0.05) greater than AZ-97MEC with both saline (+53%) and nonsaline (+21%) irrigation. Mean shoot weights of AZ-97MEC-ST were also significantly greater than 'CUF-101', and AZ-90-NDC-ST, a nondormant germplasm selected for increased shoot weight under NaCl stress and derived primarily from elite North American cultivars (3). Mean shoot weight of AZ-97MEC did not differ from that of CUF-101 under saline conditions, but was significantly greater than CUF-101 (+39%) with nonsaline irrigation.

Seed of AZ-97MEC and AZ-97MEC-ST is available upon written request to the corresponding author and agreement to make appropriate recognition of its source when either of the germplasm pools contributes to the development of a new cultivar, hybrid, or strain cross. Requests should be directed to the corresponding author. Requests from outside the USA should be accompanied by the appropriate customs control documents.

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References and Notes
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