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THE EFFECTS OF SEEDLING SELECTION ON MATURE PLANT TRAITS IN ALFALFA *(Medicago sativa* L.)

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ABSTRACT

The relationship between seedling and mature-plant traits were evaluated in 30 half-sib families of alfalfa (*Medicago sativa, L.*) resulted from polycross nursery. The leaf number per seedling, length of longest stem, cotyledon length and width, unifoliate internode length, leaf blade length and width were measured on 2000 individual 30 -day- old seedlings. All seedling traits were significantly correlated with each other. The seedlings were transplanted to the field, and individual plant fresh and dry weight, number of shoots and plant height were measured on 900 plants in each of three harvests. The results indicated that nearly all of the correlation coefficients between seedling and mature plant traits were significant, but ranged from ±0.03 to ±0.24 Selection for leaf number per seedling increased individual plant dry and fresh weight by 18.8% and 13.7%, respectively. It seems that plants and families with low yield potential can be eliminated at the seedling stage in alfalfa. Among the four selection schemes tested, mass selection produced the largest genetic gain.

Key Words: *Alfalfa, Seedling traits, Mature plant traits, Response to selection.*