EVALUATION OF SALT-TOLERANT ALFALFA GERMPLASM AT SEEDLING STAGE

KATELIN FRERICHS, South Dakota State University
ARVID BOE, South Dakota State University
LAN XU, South Dakota State University

There is an urgent need to develop salt-tolerant, economically valuable plants to minimize loss and sustain agriculture production. Some yellow-flowered alfalfa (Medicago sativa subsp. falcata) have exhibited morphological and physiological drought tolerance. Since soil salinity is associated with physiological drought, it is reasonable to expect that these drought tolerant falcata populations could be used for selecting potential parent materials for breeding salt-tolerant cultivars. The objective of this study was to identify potential parent materials from the USDA Plant Introduction Collection and naturalized populations for breeding salt-tolerant alfalfa cultivars by characterizing variations in their emergence rate, seedling survival, and growth. Emergence rate, survival, growth stage, and height were measured at the end of 62 days. The results showed that overall, relative emergence decreased as soil salinity levels increased. Generally, relative emergence of most populations increased sharply then plateaued in low saline soil. Whereas a pattern similar to that of delayed emergence was observed in populations in medium and high saline soil. PI631678 and PI502441 appeared to show characteristics in line with those of drought-tolerant alfalfa under drought stress, having the most promise as potential parent materials. Most populations consisted of primarily Growth Stage Classes 1 and 2 aside from Persist II and Wind River which had a significant amount of Class 3 growth (more advanced development). Persist II and Wind River populations also had the highest relative emergence despite not being regarded as drought-tolerant populations in previous study. These unexpected results could be due to relative large seed size.