

# Alfalfa

## GERMINATION OF ALFALFA IN HIGH SALT SOLUTIONS

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### Summary

We continue to research the development of alfalfa that will germinate at higher salt levels. Comparisons were made between the 1982 germination salt tolerant alfalfa with seed that had been produced by plants that would germinate at -2.45 MPa in 1983 and found that we have increased the ability of the seed to germinate at -2.2, -2.25, -2.30, -2.35 and -2.40 MPa salt concentrations.

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The improvement in germination of alfalfa under high saline conditions has been the objective of this research project. Each year seed from the experimental salt tolerant alfalfa is germinated in a NaCl solution that will restrict 99 percent of the seed from developing a root and resuming growth. The 1 percent of the alfalfa seedlings which do demonstrate the ability to germinate under extremely high saline conditions are transplanted into crossing blocks at the Marana Agricultural Center and honey bees are used to facilitate cross pollination among the superior plants. The seed which is collected from plants that will germinate in high saline conditions is then used to screen for individual seed that will germinate at even a higher level than the parents that were used to produce the seed.

We released Germ-Salt-I germplasm in the summer of 1983. This alfalfa germplasm displayed the ability to germinate 77 percent better at 15,900 ppm NaCl than Mesa-Sirsa alfalfa, which represented the original population we selected from. This increase in germination was accomplished over a 5-year period of selection, cross pollination and re-selection for individual seed which could germinate in higher levels of salinity. This AZ-Germ-Salt-I seed is being used to develop more salt tolerance during the germination stage.

AZ-Germination Salt Tolerant 1982 and AZ-Germination Salt Tolerant 1983 alfalfa seed were germinated at 6 NaCl levels (Figure 1). At all levels of salinity the new 1983 cycle seed germinated better than the 1982. This was particularly evident at -2.2 MPa NaCl. Those 1983 AZ-Germination Salt Tolerant seed, which germinated at -2.45 MPa, were transplanted this spring at Marana and seed is currently being produced for the 1984 cycle.

### Germination of Alfalfa in High Salt Solutions

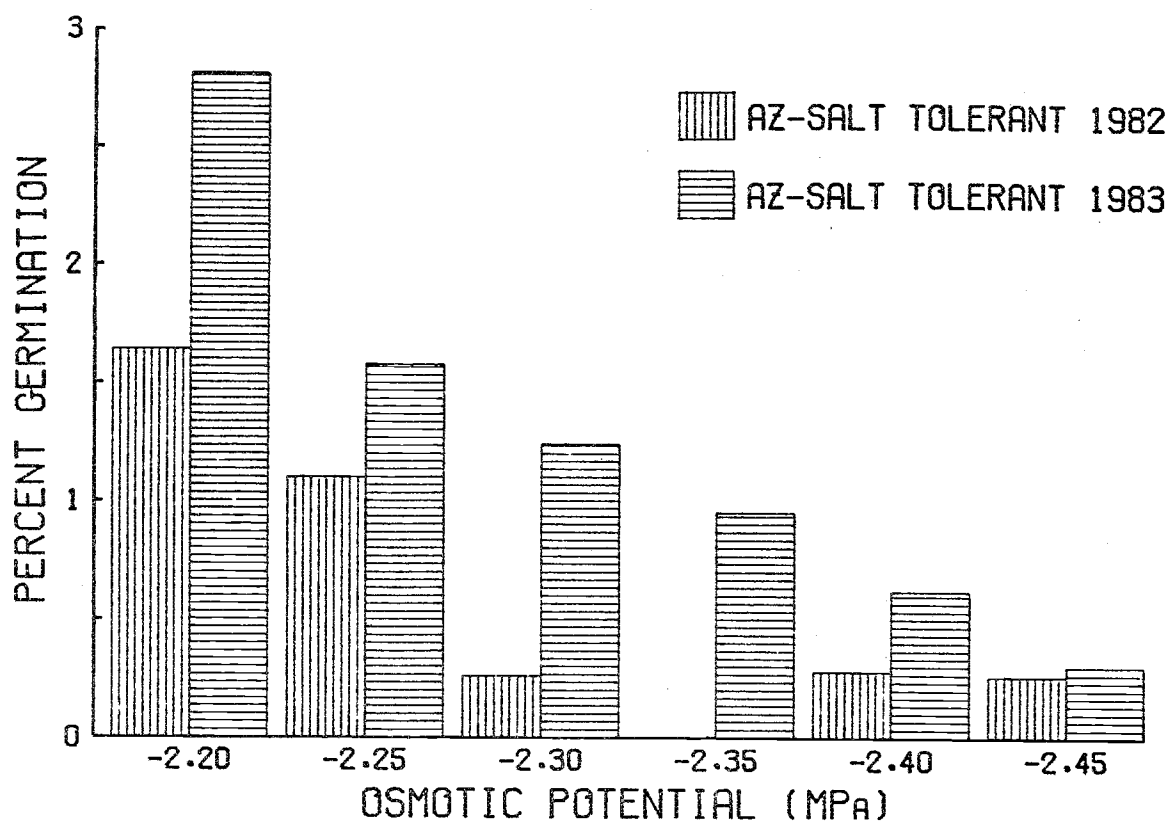


Figure 1. Germination of 1982 and 1983 salt tolerant alfalfa at several NaCl levels.