

Table 1. Average photosynthesis (PHS), respiration (RSP), and PHS/RSP ratio values for Mesa Sirsa (MS) and AZST 1982 (82) grown in four levels of NaCl.

Germplasm	NaCl (ppm)	mg CO ₂ dm ⁻² hr ⁻¹		
		PHS	RSP	PHS/RSP
MS	0	20.63	13.24	1.98
82	0	11.59	7.07	1.72
MS	6000	17.47	6.58	2.79
82	6000	14.13	6.39	2.28
MS	12000	19.66	7.01	2.84
82	12000	20.19	6.36	3.45
MS	18000	13.86	4.36	3.14
82	18000	15.34	4.63	3.46

synthesis/respiration ratio results indicate that the rate of photosynthesis increases relative to the dark respiration rate as salinity increases. Observation of the data in Table 1 would suggest that respiration may be decreasing with increasing NaCl concentration, even though this observation is not supported statistically.

Although AZST 1982 exhibits much greater germination in NaCl media than Mesa Sirsa, there is apparently no difference between the two germplasm sources for photosynthesis or respiration.

The wide variation found within each germplasm for photosynthesis and respiration may indicate the possibility of selection for these traits under stress conditions.

RHIZOCTONIA ROOT CANKER OF ALFALFA

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Black root canker of alfalfa is caused by the fungus, *Rhizoctonia solani* (Kuhn), and occurs in the irrigated desert regions of Arizona and California. The disease is characterized by a reduction in a number of secondary roots, and dark brown elliptical lesions on the tap and secondary roots. The results of this disease are stunting of the plants, stand thinning and decline, and lowered yields. Sometimes fields must be reseeded after two years.

The fungus is most active during the summer months, although the lesions seem to heal over during the fall and winter months and the plants appear to recover. Reinfection can occur the following summer, apparently at new sites on the roots. It is possible that low level infections may cause symptoms that can be mistakenly attributed to other factors, such as scald or salt damage, since the symptoms occur during the summer when temperatures are highest.

Although *R. solani* is a common soil inhabitant and is widely distributed throughout Arizona, there are many strains, and not all of them are capable of causing this disease. The fungus can survive in the soil or in plant material as sclerotia, and can survive saprophytically.

The economic importance of this disease statewide is not known, but it has been reported to have caused stand losses of 10-40%. Recently, severe incidences of this disease were found near Holtville, California and Litchfield, Arizona. There are currently no control measures known for this disease, nor any resistant varieties of alfalfa.

We are involved in a survey of the state to determine the extent and severity of this disease. Except for the field near Litchfield, we have not found any incidences of *Rhizoctonia* root canker, although our survey has not yet been completed. We are also involved in determining the strain(s) of *R. solani* involved with this disease so that we may develop varieties of alfalfa resistant to this fungus. In addition, we are studying the effects of temperature, moisture, and other factors which may affect the host-pathogen interaction.