

OVEREXPRESSION OF MULTIPLE GENES TO GENERATE SALT-TOLERANT COTTON**Ruvini W Mathangadeera****Li Sun****Hong Zhang****Department of Biological Sciences, Texas Tech University****Lubbock, Texas****Abstract**

Crop production is threatened by abiotic stresses worldwide. Among those abiotic stresses, soil salinity, drought, and heat are the major stresses encountered in many places of the world including West Texas. To meet the increasing global demand for food and fiber, it is important to come up with novel technologies that are capable of improving crop production. Genetic engineering is a major approach that can generate plants capable of withstanding severe abiotic stresses, while improving the quality of the product. Cotton is considered as an important agricultural crop worldwide. United States is the biggest cotton exporter in the world, and West Texas is a major cotton production area in the United States, accounting for about 1/3 of US total cotton production. Soil salinity is a main abiotic stress that adversely impacts the growth, yield, and quality of cotton. Over the years several genes have been introduced into transgenic plants to increase salt resistance, and these genes include AtNHX1 and SOS1. However, the improvement in salt tolerance that can be achieved is limited when only one gene is over-expressed in transgenic plants. Therefore, we hypothesized that co-overexpression of the above two genes would lead to a higher salt tolerance in transgenic plants than single gene overexpressing plants, and we confirmed this hypothesis in *Arabidopsis*. We are now introducing the AtNHX1-SOS1 double gene construct into cotton in order to make cotton significantly more salt tolerant.