

**SALINITY EFFECTS ON COTTON N UPTAKE AND ASSIMILATION OF UREA APPLIED
WITH NBPT AND DCD****E.M. Kawakami****D.M. Oosterhuis****J.L. Snider****University of Arkansas****Fayetteville, AR****Abstract**

Salinity is an abiotic stress factor that can cause significant crop yield losses. It is usually common in irrigated areas with arid climates. Cotton is classified as a moderately salt-tolerant species with a salinity threshold level of 7.7 dS m⁻¹. However cultivation of cotton in high salinity soils is known to cause significant reductions in growth and yield. Nitrogen is an essential plant element that is usually limited in most agricultural soils. It is reported that cotton is able to recover only 20.5 to 30 % of the total N applied. Recently, incorporation of additives such as NBPT and DCD into N fertilizers has been done with the objective of increase N use efficiency of crops. The objectives of this study were to evaluate the effect of salinity on the growth and stress physiology of cotton and to investigate if toxic effects of NBPT and DCD would occur in salt-stressed cotton plants. The treatments consisted of three levels of salinity: low (<1 ds-m), moderate (8 ds-m), and high (16 ds-m) and five N treatments: untreated control, full recommended N rate with urea, 75% of the recommended N rate with urea, 75% of the recommended N rate with urea plus NBPT and, 75% of the recommended N rate with urea plus NBPT and DCD. The results indicated that high salinity levels significantly reduced plant growth, N uptake, and the activity of glutamine synthetase and nitrate reductase. On the other hand high salinity significantly increased leaf antioxidants GR and SOD activity. No toxicity of NBPT or DCD was observed; but addition of NBPT significantly increased cotton N use efficiency.