

MOISTURE DISTRIBUTION IN A LABORATORY MICROWAVE DRYER**Kevin D. Baker****USDA, ARS, Southwestern Cotton Ginning Research Laboratory
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A laboratory dryer was equipped with a single set of electrical components needed to generate microwave radiation at a frequency of 2.45 GHz. The purpose was to determine if microwave radiation could successfully be used to dry seed cotton that was greater than 12 % moisture content, wet basis, and to determine how far the drying front could penetrate seed cotton at a density of 4 lb/ft³ (approximately what would be found in a feed control unit) and at a density of 12 lb/ft³ (approximately the density in a standard seed cotton module). Moisture variation in front of and to the left and right of the microwave emitter were not significantly different at all three moisture levels tested as well as for both seed cotton densities tested. Significantly more moisture was removed above the emitter than in front of or below it over all conditions tested. At a density of 4 lb/ft³, drying was evident across the entire 15 inch thickness of seed cotton after 5 minutes of drying. At a density of 12 lb/ft³, drying was evident across the entire thickness of seed cotton after 15 minutes of drying. Data from this study will be helpful in designing a dryer using multiple microwave emitters.