

**RECOVERABILITY OF RECURRENT PARENT WITH ONE
BACKCROSS IN UPLAND COTTON**

**Ross Rosenbaum and C.W. Smith
Texas A&M University
College Station, TX**

Abstract

Twenty-three F₂ and BC₁F₂ populations were developed by crossing and backcrossing twenty-three converted race stocks of upland cotton to TAM 94L-25 as the recurrent parent. TAM 94L-25 was used as the recurrent parent because of its high quality fiber properties. The converted race stocks were obtained from Dr. Jack McCarty, USDA, Mississippi State, MS. The objective of this study was to determine the recoverability of the recurrent parent and the remaining variability following one backcross. The initial crosses were made during the summer of 1998 and the backcrosses made during the winter of 1998-99 by Mr. Zeke Nasirci. F₁ and BC₁F₁ populations were grown during 1999 with open pollinated seed hand harvested. Parents, F₂, and BC₁F₂ populations were grown in single row plots, 1m x 12m, during 2000. After plot establishment, plants were thinned to one plant per 0.3m. Morphological data, node of first fruiting limb and plant height, were collected from ten randomly selected plants within each population. Three boll samples from the middle fruiting zone were harvested from approximately twenty plants per population and ginned on a laboratory roller gin. The fiber samples were sent to Cotton Incorporated for HVI analysis. Yield per plant was determined by hand harvest of approximately 20 plants per population. SAS was used to obtain one-way analysis of variance, means, and standard deviations. Forty-seven percent of the BC₁F₂ populations were equal to TAM 94-L25 for upper-half mean (UHM) length with a standard deviation range approximating that of the F₂ generation. For uniformity, twelve of the twenty-three F₂ populations equaled the recurrent parent with one backcross resulting in fifteen BC₁F₂ populations equaling TAM 94L-25 with variances equal to that of the F₂ generation. Two of the backcross populations were greater than the recurrent parent for strength with a standard deviation range of 2.4 – 3.1 g/tex. Another nineteen BC₁F₂ populations equaled the mean of the recurrent parent. The recovery of reduced short fiber content equal to that of the recurrent parent increased from seventeen populations in the F₂ to nineteen populations in the BC₁F₂ with standard deviations ranging from 0.7 to 1.5%. Plant height in the backcross generation was recovered in forty-three percent of the populations while all F₂ populations were taller than TAM 94L-25. In conclusion, one backcross to a desirable parent (in this case TAM 94-L25) increases the probability of recovering desirable traits while maintaining variability for further improvement through single plant selections in the BC₁F₂ or BC₁F₃.