

**FIBER LENGTH DEVELOPMENT OF FIVE
UNIQUE COTTON GENOTYPES**
Chris Braden and C. W. Smith
Texas A&M University
College Station, TX

Abstract

One objective of research conducted during 1998 and 1999 was to compare fiber length development times of genotypes having long fiber length with standard cultivars when grown with and without supplemental irrigation at College Station, TX. The two experimental strains of interest were TAM 94L-25 and TAM 94M-14, which are early fruiting sister lines that have excellent fiber length. These strains may carry length genes that will aid the textile industry and may make Texas dryland production competitive in length with dryland production areas east of Texas. The five genotypes compared were experimental strains TAM 94L-25 and TAM 94M-14, and commercial cultivars Suregrow 125, Acala Maxxa, and Tamcot CAMD-E. White blooms were tagged with dated tags throughout the growing seasons of 1998 and 1999. Approximately thirty green bolls subsequently were harvested by hand at pre-determined days post anthesis (DPA). The pre-determined DPAs were 16, 19, 22, 25, 28, 31, 35, 38, 42, and 45. Green bolls were allowed to dry open in a greenhouse and the fiber was hand removed from the bur and ginned on a roller gin. Fiber quality parameters were determined by HVI testing at the Texas Tech International Textile Research Center and by Cotton Incorporated. TAM 94L-25 and TAM 94M-14 were not different ($p=0.05$) in fiber length when grown with or without supplemental irrigation at any DPA. Under dryland conditions both strains reached their maximum length at 22 DPA and had a boll maturation period of 38 DPA. Even under the harsh drought conditions of 1998, L-25 had an upper half mean (UHM) fiber length of 1.25 inches, and M-14 reached 1.24 UHM. Under irrigated conditions averaged over two years, L-25 reached its maximum fiber length by 28 DPA while M-14 achieved its maximum length at 31 DPA. Both genotypes had a boll maturation period of 45 DPA and an UHM length of 1.30 inches. Under dryland conditions, Suregrow 125 initially had a longer fiber length at 16 DPA than L-25. However, TAM 94L-25's UHM length was longer ($p=0.05$) than SG 125 by the 25th DPA and maintained this extra length until cutout. Suregrow 125 reached its maximum UHM length at 22 DPA (same as 94L-25 dryland) and achieved a final length of 1.15 inches. Under irrigation, SG 125 had a significantly shorter fiber length than L-25 from 22 DPA until open boll. Irrigated SG 125 reached its maximum length at 25 DPA, three days earlier than 94L-25, and had a final UHM length of 1.14 inches. Acala Maxxa, under dryland

conditions, had a fiber length development period of 22 DPA, compared to 28 DPA under irrigation. Under both treatments Maxxa achieved an UHM length of 1.18, statistically shorter than L-25. Tamcot CAMD-E had a fiber development period of 22 DPA when grown with and without supplemental irrigation. Fibers length of CAMD-E was significantly shorter at 1.10 inches, dryland, and 1.13 inches, irrigated than L-25. TAM 94L-25 and TAM 94M-14 when grown under drought conditions in 1998 had a fiber length development period not longer than Suregrow 125, Acala Maxxa, or Tamcot CAMD-E. TAM 94L-25 and M-14 achieved their extra length by a faster growth rate than the commercial varieties when grown under dryland culture and through an extended fiber length development period when grown with supplemental irrigation at College Station, TX.