MEASUREMENT AND RELATIONSHIPS OF LEAF, STEM AND BRACT TRICHOMES ON COTTON

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Abstract

Trichomes (plant hairs) may be present over much of the cotton plant. Genotypes that lack trichomes on leaves and stems can reduce trash in ginned cotton. But, when properly defoliated, most of the trash in ginned cotton is associated with bract tissue. The objectives of this work were to evaluate the variation and relation of trichomes on leaves, stems and bracts, and to determine the effectiveness of visual ratings for evaluating these trichomes. Knowledge regarding trichomes on different plant parts is needed to assist with breeding efforts. Random plants (120 each year) from F2 populations segregating for leaf and stem pubescence were chosen from plots at Keiser, Arkansas, in 2000, 2001 and 2002. Pubescence on a leaf, stem and bract of each plant was visually rated in the field. The plant material was then taken to a laboratory where leaf (abaxil and marginal), stem and marginal bract trichomes were counted using a stereo-microscope. Trichomes on abaxil leaf, stem and bract margin were significantly and positively correlated each year. However, the relatively low magnitude of the correlation coefficients suggests some level of independence of the traits. Trichomes on leaf margins were not correlated with trichomes on abaxil leaf, but were correlated with stem and marginal bract trichomes in two of the three years. Number of trichomes increased as the visual rating of pubescence increased for each specific plant part. Pubescence on leaves and stems were effectively rated each year. The effectiveness of visual ratings of bracts was improved in 2001 and 2002 over 2000. It may be possible to decrease marginal bract trichomes within various leaf and stem pubescent types. Visual ratings may be used to screen plants for pubescence on leaves, stems and bracts. Some magnification of bract trichomes may be required to facilitate visual rating.