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PLANTING DATE AFFECTS MOTES, NEPS AND WHITE SPECKS

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Abstract

Early cotton planting in the Texas Coastal Bend has the potential for higher yields and improved fiber quality through the avoidance of drought during the fiber development period. Drought increases long-fiber mote frequency. Motes are developmentally arrested seeds in which development stopped prior to or after fertilization. Long-fiber motes have fiber longer than one half the length of normal fibers in a boll and weigh 60 mg or less. Fiber from long-fiber motes is more immature than fiber from normal seeds in the same boll. Neps are clusters of fibers or entanglements of fibers. White specks are neps that contain immature fiber and appear as light or white spots on dyed fabric. The objective of this research was to evaluate the effect of staggered planting dates on fiber properties, long-fiber motes, neps and white specks.

Cotton (Deltapine 5409) was planted early March, mid March and early April in 1997 and 1999 at the Texas A&M Agricultural Research Center, Corpus Christi, TX. Experimental design was a randomized complete block with four replications. Plots were six rows wide. Bolls were hand picked from a one meter section of a middle row. Bolls were categorized on a per boll basis. A fiber sub sample was taken from each boll and analyzed. The remaining fiber from the bolls was combined and saw ginned on a 10 saw laboratory gin. Fiber was analyzed for fiber properties and neps using the Advanced Fiber Information System (AFIS) v2.0 and v4.22. Fiber was processed at the mini spinning facility in Clemson, SC. Cotton was carded, drawn and slivers were processed into yarn (22/1's) on an open end spinning frame. Yarn was knitted on a 3 in. FAK knitter, scoured and dyed with direct Blue 80. White specks were counted manually on 40 sq. in of fabric.

In 1997, the drier of the two years, the micronafis values and maturity ratios decreased from the first to the second planting date. Immature fiber fraction was 12.4 ± 0.9% for the first planting date and 1.45 ± 1.2% for the second planting date. In 1999, the micronafis values and maturity ratios increased from the first to the second planting date. Immature fiber fraction was 11.2 ± 1.3 % for the first planting date and 7.9 ± 0.9% for the second planting date. Long-fiber motes/g seed cotton increased with lateness of planting in 1997 and decreased with lateness of planting in 1999. In 1997, fiber from the first planting date had a micronafis value of 3.86 ± 0.15 and 205 ± 20 neps/g. In 1999, fiber from the first planting date had a micronafis value of 4.32 ± 0.26 and 218 ± 15 neps/g. In 1997 fiber from the second planting date had a micronafis value of 3.51 ± 0.17 and 308 ± 77 nep/g, while in 1999 fiber from the second planting date had a micronafis value of 4.82 ± 0.29 and 155 ± 7 neps/g. Fabric white specks for the first through third planting dates in 1997 were 2.5 ± 1.1, 1.5 ± 0.9 and 0.25 ± 0.4, respectively and in 1997 were 9.5 ± 4.8, 1.8 ± 1.5 and 5.0 ± 3.1, respectively. Post-ginning processing may have changed the percentages of immature fibers and nep counts. Neither long-fiber mote or nep frequency appeared to be a good indicator of white speck potential. Long- fiber mote frequency for the second planting date was 1.29 ± 0.18 motes/g seed cotton in 1997and 0.18 ± 0.07 motes/g seed cotton in 1999. In both years the first planting date had the highest white speck counts. The propensity to form white specks may be related to the degree of fiber property variability. Immature fibers may be more easily detected in white specks if the range of fiber maturities making up the fabric is wide. If the distribution of boll weights is an indicator of the distribution of fiber maturities then measuring the range of boll weights may prove valuable in predicting white specks. The range of boll weights was greater for the first planting date than the third planting date in 1997. The percentage of bolls in weight categories below 3.3g was less than 50% for the first planting date and greater than 50% for the third planting date in 1997. In 1999 all planting dates had less than 50% of their bolls in weight categories below 3.3g.