CRYOGENICALLY TREATED GIN SAW WEAR TEST – SECOND SEASON

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Abstract

This abstract includes the final report for an initial gin saw test that was conducted during the 2014/15 ginning season and reported at the 2015 Beltwide Cotton Conferences, as well the initial report for a separate test being conducted during the 2015/16 ginning season. The objectives of the 2014/15 gin saw test were to determine: 1) if cryogenically treated (test) gin saws were more durable than standard saws (control), 2) if there were any observable HVI fiber quality differences during the season between the test and control saws, and 3) if there were any power usage differences between gin stands using the test and control saws. A fourth objective was added for the 2015/16 ginning season, which was to determine if there were any differences in ginned seed properties during the ginning season.

Both the test and control saws were installed in three different cooperating commercial gin plants located across the cotton belt in Arizona, Texas, and Arkansas, for the 2014/15 ginning test. Each commercial gin plant had multiple gin stands so that the test and control saws were operated side by side during the ginning season. The test saws performed well at all three ginning locations with each gin manager indicating they thought that the test saws were more durable than the control saws. However, due to decreased cotton production in all three areas and some mechanical problems, neither the test or control gin saws were run to the end of their useful life at any location and therefore no life cycle data was obtained. Visual examination of a random sampling of the test and control saws from each location indicated less wear for the test saws, but difficult to quantify objectively at this point. Ginned fiber quality data was inconclusive and no seed data was taken. Lessons learned from the 2014/15 test were: 1) too much test variability was introduced by testing at the three widely separated gin locations, 2) need to take ginned seed samples as well as fiber samples, and 3) need to be able to run the test and control gin saws for their full useful life.

To implement the lessons learned for the 2015/2016 ginning season, a cooperating gin was found in Mississippi that essentially had two separate saw ginning systems under the same roof. Each separate two stand system (called north and south) had identical Lummus 170 saw gin stands and were each fed by the same seed cotton cleaning system. The common seed cotton processing system operating under the same management greatly decreased the expected physical and environmental variability of the incoming seed cotton being processed through the season. All four stands were equipped with new gin saws from the same production batch at the beginning of the ginning season. Two stands (one north and one south) were equipped with untreated gin saws (control) and two stands (one north and one south) were equipped with cryogenically treated saws (test). The test protocol through the ginning season was: 1) periodically take simultaneous lint and seed samples at each stand (10 subsamples each time), 2) evaluate seed for linters content and damage, 3) evaluate ginned lint quality by AFIS and HVI, and 4) run both sets of control and test saws until gin management determines that each saw set is no longer properly performing.

Cotton availability for the 2015/16 season was such that the two gin stands on the north side system had each ginned approximately 11,000 bales per stand and the south side system approximately 9,500 bales per stand. At this point there were no significant differences in ginned fiber properties as determined by AFIS or HVI from either the test or control saws from either side. Seed data are not yet available but will be analyzed once seed property determinations are made.

Neither the test nor control saw sets from either side had reached the limits of their productive life at the end of the ginning season. All four gin saw sets will be left in their respective gin stands to start the beginning of the 2016/17 ginning season and run for the full extent of their productive life.

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