NEW SEED-COTTON RECLAIMER FOR HIGH SPEED ROLLER GINS

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Abstract

An experimental laboratory prototype reclaimer is being developed by the USDA-ARS in cooperation with Lummus Corporation. The objective of the project is to develop a seed-cotton reclaimer for high speed roller ginning that has a higher operational capacity and reduced seed loss in comparison to current seed-cotton reclaimers now used by the industry. The new seed-cotton reclaimer should also have no increased negative impacts on either ginned fiber or seed quality in comparison to current technology.

The initial design of the prototype has undergone several modifications to date by observing operation through high speed imaging techniques and by some comparative testing with a standard reclaimer. This is an initial report on the first full scale laboratory test of the experimental prototype using a standard seed-cotton reclaimer as a control. Operational factors of comparative interest were overall seed-cotton reclaimer capacity, percentage of ginned seed lost through lack of separation of seed cotton and ginned seed, and seed damage for both Pima and upland cotton. The Pima cotton used for the test was Phytogen 802 and the upland cotton was Phytogen 375. Both cottons were grown in the Mesilla Valley of New Mexico, using standard production practices for the growing area. The test design used two cotton and two reclaimer designs (standard and experimental) for four ginning treatments. Each treatment was replicated four times for a total of 16 ginning lots. Each cotton was processed at high speed roller ginning rates which were approximately 4.4 and 5.0 bales per stand per hour for the upland and Pima varieties respectively. Fiber and seed samples were taken during each ginning lot for quality analysis. There were no significant differences in lint turnout or fiber properties (HVI and AFIS) between any of the treatments before lint cleaning. The only significant difference in ginned seed properties for any of the ginning lots was that upland seed processed through the standard reclaimer was significantly lower in linters content than seed processed through the experimental reclaimer (7.1 versus 10.2 % respectively). The conclusions from this initial test were: 1) the experimental reclaimer capacity exceeded the levels tested, 2) there were essentially no negative fiber or seed factors with the experimental reclaimer, and 3) the experimental reclaimer laboratory prototype met or exceeded design goals. The only factor that was not satisfactorily evaluated by this test was seed loss by either reclaimer. The roller gin feeder will be put back to original manufacturer's specification so that seed loss through loss by the feeder trash removal may be fairly evaluated in a future test.