

**IMPROVING ENERGY EFFICIENCY IN SEED COTTON CONVEYING AND DRYING**

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**Abstract**

Cotton seed produced in the fields naturally contains moisture. The moisture content of the seed cotton is an important parameter for the ginning process. The seed cotton having too high moisture content will leave the gin and clean properly. In addition, it will not easily separate into single locks. The condition will lead to form wads that may choke and damage the gin machinery or entirely stop the ginning process. On the other side, the cotton with too low moisture content gets stick to the metal surfaces leading to generation of static charge on fibers. Other than being destructive for the ginning machinery, the moisture level below 5% damages the fiber. Cotton dryers need to be optimized to supply the gin stand lint having a moisture content of 6%–7% to preserve fiber quality. The moisture content over 7% helps preserving the fiber length at the cost of poor cleaning. Ginning above 8% may produce rougher lint, decreased gin capacity, and less effective cleaning. Thus, an efficient and controlled drying process would allow achieving required moisture level in the cotton seeds for efficient ginning. The presentation is focused on controlled drying of cotton fibers and improving the energy efficiency of pneumatic conveying and drying process. Electric power consumption is the major cost at these processing facilities. In reference to the cotton gins, electric power acclaims 20% of the variable cost. Fans used for pneumatic conveying consume the majority of electricity at cotton gins. Optimization of these conveying and drying systems is difficult and linked to exploration of the cotton drying process. It requires extensive studies on physics of flexible porous material while getting conveyed and having considered the irregular shape, size and heterogeneous nature of the cotton boll.