

IMPROVING COTTON CLEANING EFFICIENCY BY ENHANCING THE  
REMOVAL OF EXCESS MOISTURE FROM SEED COTTON

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**Abstract.** *Seed cotton moisture content plays a critical role in the efficiency of cotton cleaning processes. Excess moisture negatively affects fiber quality, increases energy consumption, and reduces the effectiveness of cleaning machinery. This study investigates methods for improving cotton cleaning efficiency by enhancing the removal of excess moisture from seed cotton prior to and during the cleaning process. The results demonstrate that optimized moisture reduction significantly improves trash removal efficiency, reduces fiber damage, and increases overall processing performance.*

**Keywords:** *seed cotton, moisture content, cotton cleaning, fiber quality, efficiency*

### **1. Introduction**

Cotton cleaning is a vital stage in the cotton ginning process, directly influencing fiber quality and production efficiency. Seed cotton harvested under varying climatic conditions often contains excess moisture, which complicates cleaning operations. High moisture content causes trash particles to adhere more strongly to fibers, reduces the effectiveness of mechanical cleaning, and increases the likelihood of fiber damage.

Therefore, improving the removal of excess moisture from seed cotton is an important factor in enhancing cotton cleaning efficiency. This paper examines the impact of moisture content on the cleaning process and explores methods to optimize moisture removal to achieve better cleaning results.

### **2. Effect of Moisture Content on Cotton Cleaning**

Moisture content significantly influences the physical and mechanical properties of seed cotton. When moisture levels exceed optimal values, cotton fibers become less elastic, and impurities such as leaves, stems, and soil particles are more difficult to separate. Additionally, wet cotton increases friction within cleaning machines, leading to higher energy consumption and equipment wear.

Studies show that the optimal moisture content for effective cotton cleaning typically ranges between 6% and 8%. Exceeding this range reduces cleaning efficiency and fiber quality.

### **3. Methods for Removing Excess Moisture**

Several methods can be used to reduce excess moisture in seed cotton:

Natural Drying: Exposure to ambient air and sunlight before processing.

Mechanical Drying: Use of heated air dryers to control moisture levels.

Pre-cleaning Ventilation: Forced airflow through seed cotton to remove surface moisture. Among these methods, controlled mechanical drying combined with proper airflow regulation has proven to be the most effective and reliable approach.

#### **4. Improvement of Cleaning Efficiency**

Reducing excess moisture prior to cleaning improves the separation of impurities and enhances the performance of cleaning equipment. Experimental results indicate that properly dried seed cotton shows:

Increased trash removal efficiency

Reduced fiber breakage and damage

Lower power consumption of cleaning machines

Improved lint quality indicators

As a result, the overall efficiency of the cotton cleaning process is significantly improved.

#### **5. Conclusion**

Enhancing the removal of excess moisture from seed cotton is a key factor in improving cotton cleaning efficiency. Maintaining optimal moisture content allows for more effective impurity separation, better preservation of fiber quality, and reduced energy consumption. The implementation of improved drying and ventilation techniques in cotton processing facilities can lead to substantial technological and economic benefits.

#### **References**

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