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Effect Of Moisture Contenent In The Process Of Storing, Drying And Cleaning The Seed Cotton

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ABSTRACT: Since 1972, there has been a steady increase in the use of Garam for storing harvested cotton. By 1992, more than half of Republic of Uzbekiston. Cotton crop was stored in Garams before ginning. A cotton Garam is a freestanding stack of cotton; the stack is produced by dumping harvested material into a form known as a Garam builder. A Garam is made of workforce in Cotton factory Several variables affect seed and fiber quality during seed cotton storage. Moisture content is the most important. Other variables include length of storage, amount of high-moisture foreign matter, variation in moisture content throughout the stored mass, initial temperature of the seed cotton, temperature of the seed cotton during storage, weather factors during storage (temperature, relative humidity, rainfall), and protection of the cotton from rain and wet ground.

KEYWORDS: Garam, Lint quality, seed cotton—fiber, seed—hygroscopic , Dry cotton.

INTRODUCTION

Today's harvesters are often used in conjunction with seed cotton storage equipment such as Garam. The type of storage or seed cotton processing may place additional constraints on the harvest process. For example, if the seed cotton is to be placed in a garam for storage, the cotton should not be harvested until it has dried to a moisture content of 12 percent or less

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on the plant and the harvested seed cotton should be free of green material, such as leaves and grass.

Early research by Uzbekistan Department of Agriculture on quality changes during seed cotton storage involved storage in bins, trailers, and bales.

Prestorage treatments included various levels of drying and cleaning. In storage treatments included aeration and drying. These studies examined the importance of moisture, trash, temperature, and length of storage on both lint and seed quality. The lint withstood higher levels of moisture than the seed before losing quality. Before this research it was considered impractical to dry or aerate seed cotton to preserve quality during storage.

The recommended procedure was to use good harvesting practices and store only low-moisture seed cotton. When seed cotton is stored, the length of the storage period is important in preserving seed quality and should be based on the moisture content of the seed cotton. Seed quality is sacrificed (germination is reduced and free fatty acid content and aflatoxin level are increased) if the relationship between moisture content and storage length is not understood.

If quality seed cotton is to be stored safely without harming lint or seed quality, it should be harvested at a moisture content below 12 percent and should contain a minimum of green trash. Water added in the picking process can also be a significant factor in creating an excess moisture condition.

Cotton possesses its highest fiber quality and best potential for spinning when it is on the stalk. Lint quality of the cotton in the bale depends on many factors, including variety, weather conditions, cultural and harvesting practices, moisture and trash content, and ginning processes.

2. The moisture of seed cotton in Garam that seed cotton stored in a rectangular shape

The Seed cotton is taken in cotton factory is made laboratory tests by Laboratory assistant. The seed cotton is tested in according to UzSt-615-2008.It is sorted according to its moisture and trash. By comparison with the following table-1, it is divided into a selection type and class of seed cotton. If there are a lot of trash and moisture in seed cotton , the price and degree of its quality turn down.

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Table-1

Type of Seed cotton	1-class		2-class		3-class	
	Percent of Trash mass	Percent of Moisture mass	Percent of Trash mass	Percent of Moisture mass	Percent of Trash mass	Percent of Moisture mass
I	3,0	9,0	10,0	12,0	16,0	14,0
II	5,0	10,0	10,0	13,0	16,0	16,0
III	8,0	11,0	12,0	15,0	18,0	18,0
IV	12,0	13,0	16,0	17,0	20,0	20,0
V	-	-	-	-	22,0	22,0

The following table-2 is indicated the amount of trash and percent of efficiency cleaning of seed cotton in comparison with Moisture

Table-2

Moisture of seed cotton, %	Efficiency of cleaning,%			Amount of trash		
	Sort of seed cotton					
	I	III	IV	I	III	IV
7-8	90,0	88,2	85,1	2,2	2,1	5,7
8-9	88,7	85,0	83,2	2,8	2,2	6,9
9-10	84,7	76,4	80,8	2,9	2,9	7,8
10-11	79,7	71,4	74,2	3,2	3,6	8,5
11-12	69,2	68,5	70,9	4,7	5,0	9,3
12-13	65,2	67,5	58,8	5,6	6,8	9,7
13-14	-	61,8	56,6	-	7,8	10,9

Both constituents of seed cotton—fiber and seed—are hygroscopic but at different levels (fig.1). Dry cotton placed in damp air will gain moisture, and wet cotton placed in dry air will lose moisture. For every combination of ambient air temperature and relative humidity, there are corresponding equilibrium moisture contents for the seed cotton, fiber, and seed. For example, if seed cotton is placed in air of 50-percent relative humidity and 70 °F, the fibers will tend to reach a moisture content (wet basis) of approximately 6 percent; the seed will tend to reach a moisture content of about 9 percent; and the composite mass will approach a moisture content of 8 percent. The equilibrium moisture content at a given relative humidity is also a function of the temperature and barometric pressure.

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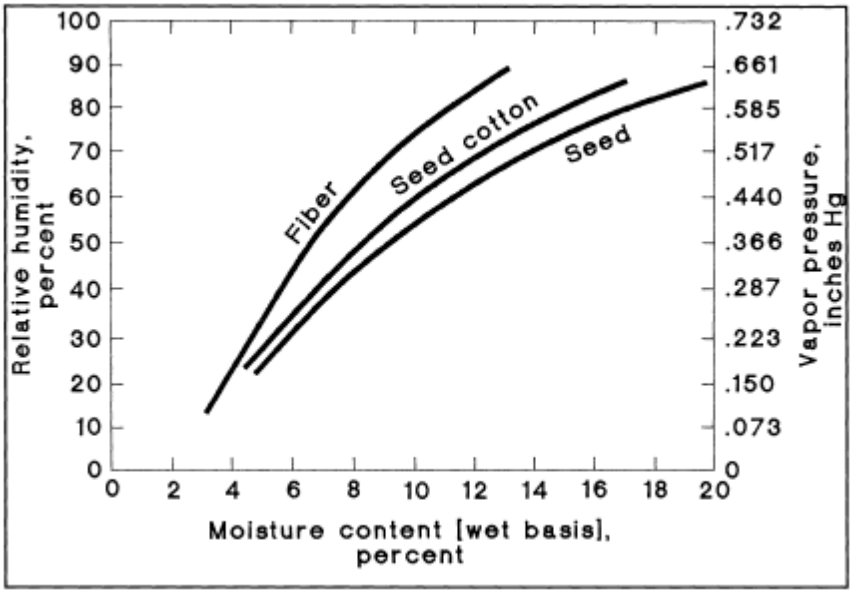
FIGURE 1



Equilibrium moisture contents of cotton fiber, seed cotton, and seed at different relative humidifies at about 70 °F and 30 inches barometric pressure.

Moisture occurs not only in fibers and seed (hygroscopic moisture) but also sometimes on their exterior surfaces (surface moisture). The ratio of hygroscopic moisture to surface moisture varies considerably unless the cotton has been stored for some time in a stable atmosphere of constant relative humidity.

The moisture contents (both hygroscopic and surface) of the fiber, seed, and trash of the seed cotton are influenced by weather, method of harvest, and time of storage between harvesting and ginning. Seed cotton that is damp or wet from rain or dew may have excessive surface moisture, whereas seed cotton exposed to moist air will have a high hygroscopic moisture content.

The Moisture content of seed cotton is very important in the ginning process. Seed cotton having too high a moisture content will not clean or gin properly and will not easily separate into single locks but will form wads that may choke and damage gin machinery or entirely stop the ginning process. Cotton with too low a moisture content may stick to metal surfaces as a result of static electricity generated on the fibers and cause machinery to choke and stop. Fiber dried to very low moisture content becomes brittle and will be damaged by the mechanical process

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required for cleaning and ginning. When pressing and baling such low-moisture cotton, it is often difficult to achieve the desired bale weight and density without adding moisture. Drying cotton at high temperatures may damage the cotton fiber. Most of the moisture removed during the short drying time in commercial gin dryers comes from the fibers rather than from the seed and trash. The seed constitute about 60 percent of the weight of spindle-harvested seed cotton. Moisture results based on oven drying of seed cotton do not necessarily indicate the ginning condition of the fibers. The moisture content of the seed is considerably less important from a ginning standpoint than the moisture content of the fibers, unless the seeds are so wet that they are soft or mushy. For satisfactory ginning, seed moisture content should not exceed 12 percent.

Effect of moisture on drying of seed cotton

The effects of atmospheric conditions, particularly relative humidity, must be considered when harvesting seed cotton. As discussed earlier, ambient conditions at the time of harvest influence the moisture content of the harvested seed cotton. The effect of relative humidity on cotton moisture is relatively simple, useful, and easily understood for ambient conditions but is less useful or meaningful as air is heated in a gin drying system. As air is heated above the boiling point of water, the term "relative humidity" is no longer appropriate and must be replaced by vapor pressure gradient" to define water movement in drying. Therefore, the discussion of cotton drying should be based on whether ambient or heated air is used for drying.

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A connection between moisture of dried seed cotton and temperature ,moisture of air used should be like a following table-3

Table-3

Moisture of dried seed cotton, %	Moisture od air used, %	Temperature od air used, °C
7	40	70……..75
8…….9	60	60……..75
12…….13	80	55…….....60

The drying continues as the warm air moves the seed cotton to the cylinder cleaner, which consists of six or seven revolving spiked cylinders that rotate at 400-500 rpm. These cylinders

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scrub the cotton over a series of grid rods or screens, agitate the cotton, and allow fine foreign materials, such as

leaves, trash, and dirt, to pass through the openings for disposal. Cylinder cleaners break up large wads and generally condition the cotton for additional cleaning and drying. Processing rates of about two bales per hour per foot of cylinder length are common.

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