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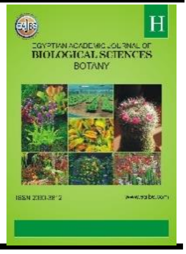

An Efficiency of Standard Procedures for Moisture Analysis Tests Used in The Egyptian Cotton Trade.

Nassar, M.A.A.[1], I.A.E. Ibrahim[1], M.I. El Bagoury[2] and Samar.A.M. Abdel Gaber[2]
1-Fac. Agric., Saba Basha, Alex. Univ., Egypt.
2- Cotton Arbitration and Testing General Organization
***E-Mail :** samar_ahmed1283@yahoo.com

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ABSTRACT

This investigation was carried out at Plant Production Department, Faculty of Agriculture (Saba-Basha), Alexandria University, Egypt and Cotton Arbitration and Testing General Organization (CATGO), Egypt, on some Egyptian cotton varieties, and some drying instruments, during 2018/2019 season. Six commercial Egyptian cotton varieties, *G. barbadense* representing the two categories of Egyptian cotton were used. The first group represents the Extra-long staple, extra fine (ELS) category these varieties were Giza 87 and Giza 96 (over 1 3/8-inch fiber length = > 35 mm). The second group represented the long staple (LS) category (1 1/4 -1 3/8-inch fiber length =30:34 mm) included long staple white i.e., Giza 86, Giza 94 and Long staple creamy i.e., Giza 95 and Giza 90. The Aqua Lab, Good Brand Jefferys(NEW), Good Brand (Developed), and H.V.I classing 1000 were used to determine the moisture, physical and mechanical properties. The Extra-long cotton varieties had a highly significant effect on fiber properties the highest mean value of fiber length (UHML) (35.60 mm), uniformity index (88.09%) were recorded for the Egyptian cotton variety Giza 87. The highest mean value of fiber strength (44.33 g/tex), spinning consistency index (SCI) (223.75) were shown by the Egyptian cotton variety Giza 96. The long staple varieties had a highly significant effect on the fiber properties the maximum value of micronaire reading (4.56), short fiber index (7.02%), maturity index (0.87) were recorded by the Egyptian cotton variety Giza 95. The highest mean value of fiber elongation (7.62%) was shown by the Egyptian cotton variety Giza 90. The maximum value reflectance degree (RD) (78.52%). The drying instruments differed significantly for five properties i.e., fiber strength, short fiber index, spinning consistency index, reflectance degree and yellowness degree. The maximum value of the short fiber index (6.32%) was shown after Good Brand (New). The highest mean value of fiber strength (40.57g/tex), spinning consistency index(SCI) (192.88) were recorded after Aqua Lab. The maximum value of reflectance degree (RD) (73.85%) was shown before drying treatment. The highest mean value of yellowness degree (+b) (10.84) was recorded after Good Brand (Developed). The Egyptian cotton varieties(V) revealed highly significant differences for all moisture properties i.e., moisture regains (MR) and moisture content (MC). The highest mean value of moisture regain (MR) (8.32%), moisture content (MC) (7.68%) were shown by the Egyptian cotton variety Giza 87. Concerning the drying instruments(I) revealed highly significant differences for moisture properties. The highest mean value of moisture regain(MR) (7.75%), moisture content (MC) (7.68%) were recorded by Good Brand (dev.).

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INTRODUCTION

Cotton is a soft, fluffy staple fiber that grows in a boll, or protective case, around the seeds of the cotton plants of the genus(*Gossypium*) in the mallow family (*Malvaceae*). The fiber is almost pure cellulose. Under natural conditions, the cotton bolls will increase the dispersal of the seeds.

Egyptian cotton (*Gossypium barbadense* L.) has a long and noble heritage of providing sumptuous comfort to millions of people right across the world. Synonymous with quality and luxury, our cotton has always stood for strength, durability and glorious softness. The fiber is most often spun into yarn or thread and used to make a soft, breathable textile. The use of cotton for fabric is known to date to prehistoric times; fragments of cotton fabric dated to the fifth millennium BC have been found in the Indus Valley Civilization. Although cultivated since antiquity, it was the invention of the cotton gin that lowered the cost of production that led to its widespread use, and it is the most widely used natural fiber cloth in clothing today.

Cotton has been spun, woven, and dyed since prehistoric times. It clothed the people of ancient India, Egypt, and China. Hundreds of years before the Christian era, cotton textiles were woven in India with matchless skill, and their use spread to the Mediterranean countries.

Egyptian cotton is hand-picked so puts less stress on the fibers, leaving them straight and intact. These fibers can be made longer to create very fine yarns which makes it possible to make yarns without sacrificing the length, giving stronger and softer cotton, unlike regular cotton which has more splice.

Since pure Egyptian cotton consistent of finer threads, they can be woven into each square inch and produce a finer and more consistent finish, ending up as a softer and more flexible fabric. As well as this, since they have not been picked by machines the fibers are stronger and more resistant to stress.

Most of the textile fibers – and cotton in the foreground – have a hygroscopic characteristic that enables it to absorb moisture from the surrounding humid atmosphere or loss of moisture to the surrounding dry atmosphere until it reaches a state of balance between its moisture content and the humidity in the surrounding atmosphere. On the other hand, many of the physical properties of the fibers are affected by the proportion of moisture content, as in the properties of strength, elongation and elastic.

Since the vast majority of fibers are used in the textile industry, the relationship of fibers to moisture becomes especially important in determining the suitability of textile for a particular use. From these different aspects, the relationship of cotton fibers to moisture is of great importance and deserves a lot of studies conducted on this subject.

When a fiber absorbs moisture, its total weight includes both the weight of the dry fiber and the weight of the moisture. The amount of moisture in the body of the fiber can be expressed in one of two measures: -

- Moisture Regain: it is defined as the weight of water in a fiber expressed as a percentage of the dry weight of the fiber.
- Moisture content: it is the weight of water in fiber, expressed as a percentage of the total weight or weight of dry fiber and moisture content.

Cotton fiber moisture is a very important aspect of cotton harvesting and processing affecting many important properties such as length, strength and uniformity. A reliable, convenient, rapid, precise and accurate means of measuring is desirable. Montalvo *et al., (*2009).

The HVI strength and length were both significantly improved by ginning at higher moisture content while the other HVI factors included were either unaffected or not consistently affected by the mc differences. Byler and Boykin (2006).

Reducing the drying capability of the air surrounding the card by increasing the degree of saturation of the surrounding ambient air (cool treatment) minimized the loss of moisture in the cotton fiber. As a result of minimizing the loss in moisture, short fiber content is reduced in card sliver and finisher drawing sliver regardless of the number of passes of drawing. This reduction in short fibers, as a result of the treatment, did not translate into improved rotor spinning performance or yarn quality. On the contrary, in the cool treatment yarn evenness was improved and yarn defects were reduced for vortex and ring spinning, and efficiency was improved for ring spinning. David *et al*. (2005).

The aim of this study was to: Determination of moisture absorption, moisture content and relative humidity of commercial cotton samples by approved instruments in Cotton Arbitration and testing general organization (CATGO). Comparison of moisture measurements with approved instruments to the standard levels of moisture content. Determine the most suitable measurements for the moisture of Egyptian cotton. Determine the most efficient methods for measuring moisture content in Egyptian cotton. Determine the efficiency of the newest instrument to measure the moisture regain and moisture content of different varieties of Egyptian cotton. Determine the appropriate weight to sell Egyptian cotton. Study the properties of the fibers estimated to have moisture properties.

MATERIALS AND METHODS

This study was conducted at Plant Production Department, Faculty of Agriculture (Saba-Basha), Alexandria University, Egypt, and Cotton Arbitration and Testing General Organization (CATGO), Egypt, on some Egyptian cotton varieties, and some drying instruments, during 2018/2019 season.

The aim of the present investigation is to estimate the percentage of absorbed moisture content and relative humidity of commercial cotton samples in the approved devices by (CATGO), and determination of the most suitable devices and most suitable measurements for the moisture of Egyptian cotton.

Six commercial Egyptian cotton varieties representing the two categories of Egyptian cotton were used. The first group represents the Extra-long staple, extra fine (ELS) category these varieties were Giza 87 and Giza 96 (over 1 3/8-inch fiber length = > 35 mm).

The second group represented the long staple (LS) category (1 1/4 -1 3/8-inch fiber length =30:34 mm) included long staple white i.e., Giza 86, Giza 94 and Long staple creamy i.e., Giza 95 and Giza 90.

Table 1: The pedigree and origin of some cotton varieties the genotypes

Cotton genotypes	Pedigree	Color	Category	Original source	Year released
First Group:					
Giza 87	(G. 77 x G. 45 A)	White	Extra long	Egypt	2002
Giza 96	(G.84x G.70 x 51B) x S62	White	Extra long	Egypt	2017
Second Group:					
Giza 86	(G 75 x G 81)	White	long	Egypt	1996
Giza 94	(G 86 x 10229)	White	long	Egypt	2016
Giza 95	(G83 x Dandara)	Creamy	long	Egypt	2016
Giza 90	G 83 (G75 x 5844) xG80	Creamy	long	Egypt	2001

All tests were performed at the laboratories Fiber and Spinning Testing Sector of cotton tests at the Cotton Arbitration and Testing General Organization (CATGO), Alexandria, Egypt.

Fiber properties:

All samples were opened and left for 24 hours at least under the standard condition of (65% ± 2) relative humidity and (20 ±1°C) temperature before being tested. The treatments were arranged in a completely randomized design with three replications.

1. High Volume Instrument (HVI classing 1000): was used to determine the fiber physical properties according to the standard method of the ASTM (D5867-05).

2.The drying instruments Aqua Lab: was used to determine the moisture properties according to ITMF 2014 (International Textile Manufacturers Federation)**,** Good Brand Jeffreyes (New) and Good Brand (Developed), were used to determine the moisture properties according to the standard method of the ASTM (D 2495-19).

Studied Characteristics:

Fiber Properties:

1-Micronaire reading.
2- Maturity index (%).
3- Upper Half Mean Length (mm).
4- Uniformity index. (%)
5- Fiber strength (g/tex).
6- Fiber elongation (%).
7- Short Fiber index (%).
8-Spinning Consistency Index (SCI).
9- Reflectance degree or Fiber brightness (Rd).
10-Yellowness degree (+b) or Chroma

Moisture Properties:

Lint cotton samples were tested under the standard conditions of (65 ±2 %) relative humidity (RH) and (20 ± 1 °C) temperature during testing.

1-Moisture Regain (MR).

Was estimated before and after drying in drying instruments according to formula:

$$M.R\% = \frac{\text{Net weight(g)} - \text{Dry weight(g)}}{\text{Dry weight(g)}} \times 100$$

2. Moisture Content(MC).

$$M.C\% = \frac{\text{Net weight(g)} - \text{Dry weight(g)}}{\text{Net weight(g)}} \times 100$$

Statistical Procedures:

This investigation was conducted in a Completely Randomized Design (CRD) with three replicates and analyzed as a factorial experiment according to the technique of analysis of variance (ANOVA) for the completely complete random (Gomez and Gomez, 1984). The data was computed using the Co-Stat program version 6.400, to test differences among the studied mean of treatments, the least significant difference (L.S.D.) was used at a 0.05 level of probability.

RESULTS AND DISCUSSION

HVI Fiber Properties as Affected by The Egyptian Cotton Varieties (V), Drying Instruments (I) and Their Interactions:

Regarding HVI fiber data in Tables (2 and 3), it is obvious that Egyptian cotton varieties (v) recorded highly significant difference for all studied properties i.e. micronaire value, maturity index, upper half mean length (U.H.M.L), uniformity index, fiber strength, fiber elongation, short fiber index, spinning consistency index, reflectance degree and yellowness degree. On the other hand, the drying instruments differed significantly for five properties i.e. fiber strength, short fiber index, spinning consistency index, reflectance degree and yellowness degree.

Concerning the first-order interaction between the Egyptian cotton varieties (v) and drying instruments, each of (U.H.M.L), fiber strength, short fiber index, spinning consistency index and reflectance degree revealed highly significant differences during 2018/2019 season.

These results were in the same trend as those obtained by Abd El-Gawad (2006), Beheary. (2005), and Eman, Z. Batisha (2005).

The Extra-long cotton variety (Giza87) recorded the highest value for fiber properties i.e., fiber length (35.60mm), uniformity index (88. 09%). While the Extra-long cotton variety (Giza 96) recorded the highest values for fiber strength (44.33 g/tex), spinning constant index (223.75). The long staple cotton variety (Giza 94) showed the maximum mean value for reflectance degree (78.52). On the other hand, the long staple cotton variety (Giza 95) recorded the higher values for fiber properties i.e., micronaire reading (4.56), maturity index (0.87), short fiber index (7.02 %). Finally, the long staple cotton (Giza 90) showed the highest values for fiber properties i.e., fiber elongation (7.62 %), short fiber index (6.97%) and yellowness degree (12.92).

Presented data in Tables (2 and 3), also showed that the drying instruments had insignificant effects on all the studied fiber properties except fiber strength, short fiber index, spinning constant index, reflectance degree and yellowness degree were most highly significant.

The treatment before drying possessed the highest mean values of fiber properties i.e., fiber elongation (6.27%), reflectance degree (73.85). while, after Aqua Lab showed the higher mean values for fiber properties micronaire reading (3.95), maturity index (0.86), fiber length (32.63 mm), uniformity index (86.62 %), fiber strength (40.57 g/tex), spinning constant index (192.88). The maximum mean value of the short fiber index (6.32%) was obtained from Good Brand (New). The highest mean value of yellowness degree (10.84) was showed by after Good Brand (Developed). These results were in harmony with those obtained by Byler and Boykin (2006), and Montalvo and Hoven (2008a, b).

These results could be explained on the basis of the highest drying instrument (Aqua Lab) contains the highest percentage of mature fibers which properties as (high values of micronaire reading, maturity index, fiber length, uniformity index, fiber strength, spinning constant index and low fiber elongation and short fiber index). Drying instruments differed from one instrument to another that due to the ability of each instrument to completely dry and measure the moisture in the cotton sample.

Concerning the first order interaction between Egyptian cotton varieties and drying instruments it can be mention that the best mean values of the highest fiber properties i.e., fiber strength (44.68 g/tex), spinning constant index (228) were obtained from the Egyptian cotton variety (Giza 96) after Aqua Lab, fiber length (35.76mm) was recorded by the Egyptian cotton variety (Giza 87) after Good Brand(New), reflectance degree (79.06) was showed by the Egyptian cotton variety (Giza 94) after Aqua Lab and the short fiber index (7.30%) was recorded by the Egyptian cotton variety (Giza 95) before drying treatment, however the minimum mean values of the lowest fiber properties i.e., fiber length (27.59mm) and fiber strength (32.45g/tex) were obtained by the Egyptian cotton variety (Giza 90) before oven, the short fiber index (5.55%) was showed by the Egyptian cotton variety (Giza 87) after Aqua Lab, spinning constant index (134.66) was recorded by the Egyptian cotton variety (Giza 90) before oven and reflectance degree (66.36%) was showed by the Egyptian cotton variety (Giza 90) after Good Brand(developed), as shown in Table (4). These results were in line with those obtained by Bragg *et al.*, (1998), Byler and Anthony (1998) and Byler *et al.*, (2001).

Table 2: Mean squares of fiber properties as influenced by the Egyptian cotton varieties (V), drying instruments (I) and their interactions during 2018/2019 season.

S.O.V	d.f	Micronaire Reading	Maturity index	Fiber length		Mechanical properties		Short fiber index	Spinning Constant Index	Color	
				Length (U.H.M.L.)	Uniformity Index	Fiber strength	Fiber elongation			Reflectance degree	Yellowness degree
Blocks	2	0.01n.s	0.001n.s	0.04n.s	0.66n.s	1.08n.s	0.04n.s	0.05n.s	43.56n.s	0.05n.s	0.01n.s
Cotton Variety(V)	5	3.27**	0.012**	118.53**	36.50**	191.40**	7.41**	5.73**	12904.82**	268.31**	27.22**
Drying Instruments(I)	3	0.02n.s	0.001n.s	0.35n.s	0.95n.s	4.82**	0.04n.s	0.17**	268.92**	0.85*	1.87**
Interaction (V x I)	15	0.011n.s	0.005n.s	0.53**	0.42n.s	4.14**	0.09n.s	0.21**	132.68**	0.77**	0.04n.s
Error	48	0.009	0.003	0.17	0.40	0.50	0.12	0.04	44.15	0.288	0.03
Total	71	---	---	---	---	---	---	---	---	---	---

*, ** Significant and highly significant differences at 0.05 and 0.01 levels of probability, respectively.
n.s: Not significant difference at 0.05 level of probability.

Table 3: Mean performance of fiber properties as affected by the Egyptian cotton varieties (V), drying instruments (I) and their interactions during 2018/2019 season.

Fiber properties Entries	Micronaire Reading	Maturity index	Fiber length		Mechanical properties		Short fiber Index (%)	Spinning Consistency Index	Color	
			Length (U.H.M.L)	Uniformity index (%)	Fiber strength	Fiber elongation (%)			Reflectance degree (Rd)	Yellowness degree(+b)
			(mm)		(g/ tex)			(SCI)		
Cotton Variety (V)										
Giza 87	3.14 f	0.84 d	35.60 a	88.09 a	42.14 b	5.39 d	5.56 c	215.75 b	75.46 c	9.59 c
Giza 96	3.58 e	0.85 c	35.25 b	87.59 ab	44.33 a	5.72 c	5.62 c	223.75 a	76.02 b	9.41 d
Giza 86	4.08 c	0.86 b	32.44 d	86.58 c	41.84 bc	5.89 c	6.42 b	195.66 d	76.43 b	9.32 d
Giza 94	3.77 d	0.85 c	34.13 c	87.56 b	41.34 c	6.25 b	5.63 c	202.25 c	78.52 a	9.57 c
Giza 95	4.56 a	0.87 a	29.04 e	84.46 d	36.11 d	6.49 b	7.02 a	152.66 e	69.14 d	11.62 b
Giza 90	4.35 b	0.85 c	28.31 f	84.00 d	33.99 e	7.62 a	6.97 a	145.25 f	66.50 e	12.92 a
L.S.D 0.05	0.07	0.004	0.34	0.51	0.57	0.28	0.15	5.45	0.44	0.14
Drying instruments (I)										
Before drying	3.92 a	0.85 a	32.39 a	86.07 a	39.79 bc	6.27 a	6.23 ab	185.611 b	73.85 a	10.14 c
After Aqua Lab	3.95 a	0.86 a	32.63 a	86.62 a	40.57 a	6.18 a	6.09 c	192.88 a	73.82 a	10.18 c
After Good Brand (New)	3.92 a	0.86 a	32.32 a	86.43 a	39.35 c	6.18 a	6.32 a	186.16 b	73.66 ab	10.47 b
After Good Brand (Developed)	3.86 a	0.85 a	32.51 a	86.40 a	40.13 ab	6.26 a	6.18 bc	192.22 a	73.38 b	10.84 a
L.S.D 0.05	0.16	0.003	0.38	0.47	0.47	0.23	0.12	4.45	0.36	0.12
Interaction										
(V x I)	n.s	n. s	**	n. s	**	n. s	**	**	**	n. s

Means within each column followed by the same letter are not a significant difference at 0.05 level of probability
* * Highly significant difference at 0.01 level of probability.
n.s: Not significant difference at 0.05 level of probability.

Table 4: The first order interaction between Egyptian cotton varieties (V) and drying instruments (I) for fiber properties on HVI 1000 instrument during 2018/2019 season.

Cotton Variety (V)	Drying Instruments (I)	Fiber Properties				
		Fiber Length (U.H.M.L) (mm)	Fiber strength (g/ tex)	Short fiber Index (%)	Spinning Constance Index (SCI)	Reflectance degree (Rd)
Giza 87	Before Oven.	35.56 ab	42.81 cde	5.56 g	213.66 bcde	74.76 h
	After Aqua Lab.	35.45 ab	41.00 f	**5.55 g**	209.33 cdef	75.23 gh
	After Good Brand(new)	**35.76 a**	41.13 f	5.56 g	216.66 bc	76.41 def
	After Good Brand(dev.)	35.63 ab	43.64 abc	5.56 g	223.33 ab	75.45 gh
Giza 96	Before Oven.	35.60 ab	44.36 a	5.63 g	224.00 ab	76.90 cd
	After Aqua Lab.	35.18 ab	**44.68 a**	5.63 g	**228.00 a**	76.38 def
	After Good Brand(new)	35.24 ab	44.13 ab	5.63 g	215.33 bcd	75.56 fgh
	After Good Brand(dev.)	35.00 bc	44.14 ab	5.60 g	227.66 a	75.25 gh
Giza 86	Before Oven.	32.87 f	43.03 bcd	6.03 f	200.33 fgh	76.58 de
	After Aqua Lab.	32.58 fg	42.80 cde	6.05 f	205.66 defg	76.50 de
	After Good Brand(new)	31.98 g	39.58 g	7.20 abc	182.00 i	76.00 efg
	After Good Brand(dev.)	32.32 fg	41.93 def	6.41 e	194.66 h	76.65 de
Giza 94	Before Oven.	34.30 d	41.34 f	5.60 g	197.33 gh	78.93 a
	After Aqua Lab.	34.25 de	41.78 ef	5.66 g	204.33 efgh	**79.06 a**
	After Good Brand(new)	33.56 e	41.21 f	5.66 g	201.66 fgh	78.33 ab
	After Good Brand(dev.)	34.43 cd	41.05 f	5.60 g	205.66 defg	77.76 bc
Giza 95	Before Oven.	28.41 j	34.73 hi	**7.30 a**	143.66 kl	69.43 i
	After Aqua Lab.	29.88 h	38.65 g	6.70 de	163.33 j	69.23 i
	After Good Brand(new)	28.76 ij	35.24 hi	7.13 abc	149.33 k	69.10 i
	After Good Brand(dev.)	29.14 i	35.82 h	6.98 bcd	154.33 jk	68.81 i
Giza 90	Before Oven.	**27.59 k**	**32.45 j**	7.26 ab	**134.66 l**	66.53 j
	After Aqua Lab.	28.48 ij	34.50 i	6.95 cd	146.66 k	66.53 j
	After Good Brand(new)	28.62 ij	34.80 hi	6.75 d	152.00 k	66.58 j
	After Good Brand(dev.)	28.55 ij	34.23 i	6.91 cd	147.66 k	**66.36 j**
LSD 0.05		**0.68**	**1.15**	**0.31**	**10.90**	**0.88**

Means within each column followed by the same letter are not a significant difference at 0.05 level of probability.

Moisture Properties (moisture regain and moisture content) as Influenced by The Egyptian Cotton Varieties (V), Drying Instruments (I) and Their Interactions (VxI) During 2018/2019 Season:

Looking forward to the data in Tables (5 and 6), it could be noticed that the Egyptian cotton varieties(v), drying instruments(I) and their interaction (VXI) recorded highly significant differences for all moisture properties i.e., moisture regain(MR) and moisture content(MC). The highest mean values of moisture regain (8.32%) and moisture content (7.68%) were recorded by the Egyptian cotton variety Giza 87. Whereas, the lowest mean values of the same traits (6.46% and 6.07%) were attained by the Egyptian cotton variety Giza 95. Concerning, the drying instruments the highest mean values of moisture regain (7.75%) and moisture content (7.20%) were showed by Good Brand (Developed), while the lowest mean values of the same traits (7.27% and 6.77%) were recorded by Good Brand (New). These results were in agreement with those obtained by ASTM (2004), David *et al.*, (2004a) and David *et al.*, (2004b).

Table 5: Mean squares of moisture regain and moisture content as influenced by the Egyptian cotton varieties (V), drying instruments (I) and their interactions (VxI) during 2018/2019 season**.**

S.O. V	d.f	Mean Square	
		Moisture Regain (%)	Moisture Content (%)
Blocks	2	0.03n.s	0.03n.s
Cotton Variety(V)	5	4.93**	3.69**
Drying Instruments(I)	2	1.03**	0.82**
(V x I)	10	0.42**	0.31**
Error	36	0.039	0.02
Total	**53**	---	---

* *Highly significant difference at 0.01 level of probability**.**

Table 6: Mean performance of moisture regain and moisture content as affected by the Egyptian cotton varieties (V), drying instruments (I) and their interactions during 2018/2019 season.

Properties Entries	Moisture Regain (%)	Moisture Content (%)
Cotton Variety (V)		
Giza 87	8.32 a	7.68 a
Giza 96	7.80 c	7.24 c
Giza 86	7.52 d	7.00 d
Giza 94	8.10 b	7.49 b
Giza 95	6.46 f	6.07 f
Giza 90	6.76 e	6.34 e
L.S.D 0.05	**0.18**	**0.16**
Drying instruments (I)		
Aqua Lab	7.46 b	6.93 b
Good Brand (New)	7.27 c	6.77 c
Good Brand (Developed)	7.75 a	7.20 a
L.S.D 0.05	**0.13**	**0.11**
Interaction		
(V x I)	**	**

Means within each column followed by the same letter are not a significant difference at 0.05 level of probability.
**Highly significant difference at 0.01 level of probability.

Tabulated data in Table (7) showed that the Egyptian cotton variety (Giza 87) with the Good Brand (developed) instrument recorded the desirable and highest mean values for moisture regain (8.64%) and moisture content (7.95%). On the other side, the Egyptian cotton variety (Giza 95) with the Good Brand(new) instrument recorded the lowest mean values for moisture regain (6.12%) and moisture content (5.76%). Similar results were attained by Byler (2012) and Byler (2014).

Table 7: The interaction between Egyptian cotton varieties(V) and drying instruments (I) for moisture regain and moisture content during 2019 season.

Cotton Variety (V)	Drying Instruments (I)	Moisture Properties	
		Moisture Regain (%)	Moisture Content (%)
Giza 87	Aqua Lab	8.18 bc	7.56 bc
	Good Brand(new)	8.13 bc	7.52 bc
	Good Brand(dev.)	**8.64 a**	**7.95 a**
Giza 96	Aqua Lab	7.89 cd	7.31 cd
	Good Brand(new)	7.18 f	6.70 f
	Good Brand(dev.)	8.34 ab	7.70 ab
Giza 86	Aqua Lab	7.55 e	7.01 e
	Good Brand(new)	7.98 cd	7.40 cd
	Good Brand(dev.)	7.02 f	6.60 f
Giza 94	Aqua Lab	8.15 bc	7.54 bc
	Good Brand(new)	7.70 de	7.15 de
	Good Brand(dev.)	8.45 ab	7.79 ab
Giza 95	Aqua Lab	6.40 hi	6.01 hi
	Good Brand(new)	**6.12 i**	**5.76 i**
	Good Brand(dev.)	6.87 fg	6.44 fg
Giza 90	Aqua Lab	6.58 gh	6.17 gh
	Good Brand(new)	6.53 h	6.13 h
	Good Brand(dev.)	7.17 f	6.71 f
LSD 0.05		**0.33**	**0.28**

Means within each column followed by the same letter are not a significant difference at 0.05 level of probability.

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ARABIC SUMMARY

تقدير كفاءة الطرق القياسية لإختبارات الرطوبة المستخدمة في تجارة القطن المصرى.

محمد أحمد عبد الجواد نصار [1], ابراهيم عباس السيد [1], محمود اسماعيل الباجوري [2], سمر أحمد محمود عبد الجابر[2]

1- قسم الأنتاج النباتي- كلية الزراعة – سابا باشا – جامعة الأسكندرية
2- الهيئة العامة للتحكيم واختبارات القطن – الأسكندرية

أجري هذا البحث في قسم الأنتاج النباتي بكلية الزراعة- سابا باشا جامعة الأسكندرية ومعامل الهيئة العامة للتحكيم وأختبارات القطن بالاسكندرية, لقياس مدى كفاءة أحدث جهاز لتقدير الرطوبة ومقارنته بالأجهزة التقليدية الموجودة حاليا, ودراسة خواص الألياف المقدر لها خواص الرطوبة سابقا خلال موسم 2019/2018 تم أستخدام ست أصناف من القطن جيزة 87 وجيزة 96 اللذان يمثلان طبقة الأقطان فائقة الطول , جيزة 86, جيزة 94, جيزة 90, جيزة 95 ويمثلوا طبقة الأقطان الطويلة وينتموا جميعا الي مجموعة الأقطان *(Gossypium barbadense L.)*, كما أستخدمت أجهزة HVI 1000, Aqua Lab , Good Brand (new), Good Brand (developed) لتقييم الخواص الطبيعية والميكانيكة وخواص الرطوبة للألياف.

ويمكن تلخيص أهم النتائج المتحصل عليها فيما يلي :

- أختلفت الأصناف أختلافا عالي المعنوية لصفات الألياف حيث سجل الصنف جيزة 87 أعلي القيم 35.60 مم (لطول الربيع الأعلي), 88.09% (نسبة أنتظام الألياف). بينما سجل الصنف جيزة 96 أعلي القيم 44.33 جم/تكس (متانة الخصلة), 223.75 (معامل ثابت الغزل), في حين القيمة الأعلي 78.52(معامل الأنعكاس) كانت لصنف جيزة 94, بينما سجل الصنف جيزة 95 القيم الأعلي 4.56 (قراءة الميكرونير), 0.87 (نسبة النضج), 7.02% (نسبة الشعيرات القصيرة), أخيرا سجل الصنف جيزة 90 القيم الأعلي 7.62% (استطالة الألياف), 12.92 (درجة الأصفرار).

- كما أختلفت أجهزة قياس الرطوبة أختلافا معنويا لكل صفات الألياف المدروسة حيث سجلت كلا من صفات الألياف الأتية أعلي القيم 3.95 (قراءة الميكرونير), 0.86 (نسبة النضج), 32.63 مم(طول الربيع الأعلي), 86.62% (نسبة أنتظام الألياف), 40.57 جم/تكس (متانة الخصلة), 6.18% (أستطالة الألياف)و 192.88(معامل ثابت الغزل) لجهاز الأكوالاب, بينما سجل جهاز جود براند (الحديث) أعلي قيمة 6.32 % (نسبة الشعيرات القصيرة), أما جهاز جود براند (المطور) سجل أعلي قيمة 10.84(درجة الأصفرار).
- أختلفت الأصناف أختلافا عالي المعنوية لصفات الرطوبة حيث سجل الصنف جيزة 87 أعلي القيم 8.32% (نسبة الأسترداد الرطوبي), 7.68% (نسبة المحتوي الرطوبي).
- سجل جهاز جود براند(المطور) أعلي القيم لصفات الرطوبة المذكورة سابقا.