Effect of Location and Seed Cotton Level on The Fiber Quality Index of The Egyptian Cotton

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ABSTRACT

The fiber properties of the three Egyptian cotton varieties, i.e. Giza 85, Giza 86 and Giza 88, with four lint grades from three locations were tested using the HVI Spectrum II system and spun at 60's with 3.6 twist multiplier to study the effect of location and seed cotton level on the fiber quality index for the two seasons 2006 and 2007.

Multiple regression analysis and relative contribution percentage of the fiber properties were computed. The attained results reveal that micronaire reading, strength and elongation were significantly affected by the growing location in the first season, while micronaire reading, maturity index, length uniformity index, strength, yellowness degree (+b) and trash count were significantly affected by the growing location in the second season. The highest values of fiber strength and elongation in the first season and micronaire reading, maturity index, length uniformity index, strength and trash count in the second season were recorded by the cotton grown in Al-Rahmania, while the highest values of yellowness degree (+b) was gained by the cotton grown in Shobrakhit in the second season.

The highest values of the fiber properties were attained from the highest cotton grades and gradually decreased as the lint cotton grade decreased in both seasons except short fiber index, trash count and trash area whereas their highest values were attained by the lowest cotton grade and gradually decreased as the lint cotton grade increased. The cotton location and grade interaction was insignificant for most of the studied fiber properties in both seasons while there were significant for most yarn properties in both seasons.

Fiber quality indices based on the relative contribution of each fiber character to the corresponding yarn quality using both single yarn strength and lea product as indicators for yarn quality couldn't be established because the contribution percentage for the major fiber properties was very weak. This is may be due to low variability in those fiber properties within the variety as they are varietal properties mainly affected by the genome.

Regression equations for predicting two yarn quality parameters were obtained as shown later.

INTRODUCTION

Cotton is grown in a large area, from south to north of the world. Environmental conditions may vary from one location to another and from year to year in the same area. Thus the evaluation of commercial varieties in different locations and seasons is of great importance for the cotton quality.

From the spinner's point of view, the reasonable uniformity in quality of cotton in terms of grade is essential and required to attain even-running of cotton in processing and produce yarns of satisfactory performance.

It is worthy to mention that we are, in Egypt, still in need for the visual classification for application in the local marketing system, as producers sells seed cotton.

Fiber quality index (FQI), was proposed by Lord (1961) and used, later by Foster *et al.* (1983) as follows: FQI = Stelometer strength X 2.5% Span length / Standard fineness.

El-Mogahzy *et al.* (1989) stated that, there is a major problem with regression analysis on cotton fiber and yarn properties, is the lake of generality. El-Mogahzy *et al.* (1990) proposed an equation for calculating the fiber quality index (FQI) as follows: FQI = FL*LU*FS/FF. Where: FL: Fiber Length, LU: Length Uniformity, FS: Fiber Strength, FF: Fiber Fineness.

A Trash Code = 0.1 X Trash Count X Trash Area, is highly significant and negatively correlated with the classer's grade, and a simple equation for calculating the Instrumental Grade (IG) = 10 Rd% / Trash Count X Trash Area, were proposed by, Hossam El-Din *et al.* (2002).

Beheary (2004) modified the equation proposed by El-Mogahzy et al. (1990) to be convenient for the Egyptian cotton by replacing the micronaire value bythe intrinsic fiber fineness or the average fiber perimeter (P) multiplied by the maturity index (Mat) and the modified fiber quality index (mFQI) was calculated as follows : mFQI = FL x LU x FS / (P x Mat). Where: FL: Fiber Length, LU: Length Uniformity, FS: Fiber Strength, P: The average perimeter of Giza 70 cotton variety (39.6μ) Mat.: Maturity index.

Beheary *et al.* (2004) proposed the following formula of the Fiber Quality Index (FQI) that can be used as a reliable measure for determining the actual or technological value of the Egyptian cotton.
FQI = 11.43 Mic. + 38.75 FL + 12.67 FS /7.69 MI. Where: Mic. = Micronaire value, FL = Fiber Length (inches), FS = Fiber Strength (g/tex.), MI = Maturity index.

The micronaire value, maturity index, upper half men length and length uniformity index were gradually decreased as the lint cotton grade decreased and vice versa (Fouda 2004). The effect of genotypes, location, years and the first order of interactions, i.e. location by years, were highly significant for all fiber and yarn properties except genotype by years for micronaire reading trait and years effect for yarn unevenness (Hassan and Sanad 2006).

Excessive fiber length variation tends to increase manufacturing waste and adversely affect processing performance, including spinning performance and yarn quality (Hunter 2006).

The good performance of linear regression models in explaining yarn properties indicates that the relationships between fiber properties, roving properties, yarn count and twist, as well as yarn properties are very nearly linear (Ureyen and kadoglu 2007).

The present study was conducted to demonstrate the effect of the growing location and season on the lint grade and fiber quality index. Besides, the relative contribution of the Giza 88 HVI fiber properties to the different yarn quality parameters.

MATERIALS AND METHODS

Seed cotton samples of three cotton varieties attained from three locations: Giza 88 from "Shobrakhit, Al-Rahmania and Etay El-Baroud", Giza 86 from "Sidi Salem, Disouq and Biyala" and Giza 85 from "Tala, Berket El-Sabea and Quesna" with four lint grades, namely: Good to Fully Good (G/FG), Good +1/4 (G+1/4), Good (G) and Good -1/4 (G-1/4), were used in this study for the two seasons of 2006 and 2007.

Each sample was thoroughly blended and ginned in order to make it as homogenous as possible, then classed by a committee of three expert classers. Four sub samples (replicates), half kilo grams lint cotton in weight each, were drawn from each grade. Those samples were obtained from: ALCOTAN Cotton Trading & Export Co., El-Wady Trading & Cotton Ginning Co., and Modern Nile Cotton Co.

The fiber properties were tested using the High Volume Instrument (HVI) Spectrum II system under the standard conditions at the Fiber Testing Labs of Cotton Arbitration & Testing General Organization (CATGO), Smouha, Alexandria.

Those samples were spun at 60's with 3.6 twist multiplier using a conventional ring-spinning machine and yarn properties were determined according to ASTM at the Cotton Technology Research Laboratories, Cotton Research Institute Agriculture Research Center, Giza, Egypt. Card waste percentage was calculated as the total loss in weight, include: dust, some long fibers, short fibers, neps and trash.

The experimental work was carried out in a completely randomized design with four replicates for each season. Analysis of variance as a factorial experiment and Least Significant Difference (L.S.D.) as well as the multiple regression were computed according to Steel and Torrie (1961). The relative contribution percentage of the HVI fiber properties to yarn

quality was determined using the values of the standard partial regression coefficients which are denoted by B*. The relative contribution percentage of the fiber property (C_i) was calculated using the following equation: $C_i\% = 100 (B_i^* / \Sigma B_i^*) R^2$, Where: B_i^* is the partial coefficient of the variable ($i = 1, 2, ..k$) and R^2 is the coefficient of determination.

RESULTS AND DISCUSSION

The attained results will be presented and discussed in six main categories as follows:

1. Location effect:

1.1. Location effect on HVI fiber properties:

Table (1) shows that the studied cotton growing locations significantly varied for Giza 88 in the micronaire value in the two seasons, while the differences in the maturity index, length uniformity index, yellowness degree (+b) and trash count were only significant in the second season due to the same factor.

On the other hand, the upper half mean length (U.H.M.), the short fiber index, fiber reflectance degree (Rd. %) and trash area were insignificantly affected by the growing location in both seasons.

In case of Giza 86, the studied cultivating locations had a highly significant effect on micronaire reading, fiber bundle strength and elongation in the second season only, and significant effects for trash area in the first season, as well as maturity index, reflectance (Rd %), yellowness degree (+b) and trash count in both seasons. While,the fiber length parameters (U.H.M. length, length uniformity % and short fiber index) were insignificantly affected by this factor in the two seasons.

As for Giza 85, cultivating locations significantly varied in in U.H.M. length, fiber bundle strength, elongation (%), color reflectance degree (Rd %), trash count and area in the first season and yellowness degree (+b) in the second season, as well as micronaire reading and maturity index in both seasons. While, length uniformity % and short fiber index were insignificantly affected in the two seasons.

1.2. Location effect on yarn properties:

As shown in Table (2), highly significant differences were found in the lea product and card waste percentage % among the studied cotton growing locations in the first season and significant differences in single yarn strength in the second season and elongation (%) in the two seasons for Giza 88.

As for Giza 86, there were significant differences in the lea product due to the growing location in the second season and in elongation (%) and

card waste percentage (%) in both seasons, while it was insignificant for single yarn strength in the two studied seasons.

In case of Giza 85, significant differences among the studied cotton growing locations were found for lea product in the first season only and for single yarn strength and elongation (%) in the two studied seasons.

2. Grade effect.

2.1. Grade effect on HVI fiber properties:

The studied cotton grades of Giza 88 significantly varied for micronaire value, maturity index, length uniformity index, short fiber index, fiber bundle strength, color reflectance degree (Rd. %), yellowness degree (+b), trash count and trash area in the two seasons, there was a significant effect for the elongation percentage in the first season and in the upper half mean length (U.H.M.) for the second.

As for, Giza 86, there were significant differences for the micronaire value, maturity index, reflectance degree (Rd %), trash count and trash area among the studied cotton grades in both studied seasons and for the U.H.M. length and fiber bundle strength in the second season.While length uniformity %, short fiber index, elongation (%) and yellowness degree (+b) were insignificantly affected.

In case of Giza 85, highly significant differences for the micronaire value, maturity index, length uniformity, fiber bundle strength, elongation, color reflectance degree (Rd. %), yellowness degree (+b), trash count and trash area due to lint grade in both studied seasons and for the short fiber index in the first season, U.H.M. length in the second season were found as indicated in Table (1).

2.2. Grade effect on yarn properties:

As presented in Tabel (2), there were highly significant differences among the studied cotton grades of Giza 88 for the lea product, single yarn strength, elongation percentage and card waste percentage (%) in both seasons.

In case of Giza 86, significant differences due to the same factor for the lea product, elongation (%) and card waste (%) in both seasons as well as single yarn strength in the first season only were found.

As for Giza 85, highly significant differences among the studied lint grades for the lea product, single yarn strength, elongation % and card waste percentage % in both seasons were found.

3. Location and grade interaction effect:

3.1. Location and grade interaction effect on HVI fiber properties:

The highest values for micronaire reading and maturity index were reached by the highest lint grade (G/FG) of Giza 88 cultivated in Shobrakhit

in the first season. In the second season, the highest mean value for micronaire reading was gained by the grade (G+1/4) of the same variety cultivated in Al-Rahamnia. As for maturity index in the second season, the highest mean value was recorded for the lint grade (G/FG) of the cotton cultivated in Shobrakhit and the grade (G+1/4) of Al-Rahamnia.

The highest value of reflectance degree (Rd%) was reached by the highest lint grade (G/FG) of Etay El-Baroud. The highest mean value of the yellowness degree (+b) was attained by the grade (G+1/4) of Shobrakhit and the grade (GOOD) of Etay El-Baroud.

As for trash count, the highest value was reached by the lowest lint grade (G-1/4) of Shobrakhit in the second season. In the case of trash area, the highest mean value was reached by the lowest lint grade (G-1/4) of Etay El-Baroud in the second season (Table 1).

In case of Giza 86, the highest micronaire values were recorded by the lint grades (G/FG) and (G+1/4) of Biyala in the two seasons, respectively. The highest mean values of maturity index were recorded for the lint grades (G/FG) and (G+1/4) of Biyala, respectively, in the two seasons.

The highest values of the length uniformity were attained from the lint grade (GOOD) of Disouq. As for U.H.M. length, the highest value was also gained by the cotton grade (GOOD) of Disouq.

Concerning short fiber index, the highest value was recorded by the highest lint grade (G/FG) of Disouq.

The highest mean values of the color brightness were possessed by the highest lint grade (G/FG) of Biyala in both seasons.

Concerning the yellowness degree (+b), the highest mean values were gained from the cotton grades (GOOD) and (G-1/4) of Biyala in the second season.

The highest mean values of the trash count were possessed by the lowest grade (G-1/4) of Biyala in both seasons.

The highest mean values of trash area were recorded by the lowest cotton grade (G-1/4) of Biyala in the first season and grade (G+ 1/4) of Disouq in the second (Table 3).

As for Giza 85, the highest mean micronaire values were recorded by the lint grade (G+1/4) of Tala in the two seasons. The highest maturity index was obtained from the lint grade (G+1/4) of Tala in the second season. The highest mean value of the short fiber index was obtained from the lint grade (GOOD) of Quesna. The highest mean values of the reflectance degree (Rd %) were recorded by the lint grade (G+1/4) of Tala and Quesna. The highest mean values of the yellowness were possessed by the lowest cotton grade (G-1/4) of Quesna in the first season, and by the

cotton grades (G+1/4) and (G-1/4) cultivated in Tala and the grade (G-1/4) grown in Quesna in the second.

The highest mean values of the trash count were reached by the lint grades (GOOD) and (G-1/4) of Berket El-Sabea and Tala in the first season, and by the lowest cotton grade (G-1/4) cultivated in Quesna in the second season. Concerning trash area, the highest mean value was gained from the cotton grade (GOOD) of Berket El-Sabea (Table 5).

3.2. Location and grade interaction effect on yarn properties:

The highest mean value of the lea product was attained by the grade (G/FG) of Giza 88 cultivated in Al-Rahmania in the first season. The highest mean values of the single yarn strength were recorded by the highest cotton grade (G/FG) of Etay El-Baroud. As for single yarn elongation %, the highest mean value was recorded by the grade (G-1/4) of Shobrakhit in the first season. The highest mean value in the second season was also attained by the grade (G/FG) cultivated in Shobrakhit.

The highest mean values of the card waste percentage were attained by the lowest grade (G-1/4) of Al-Rahmania in the first season and by the same grade cultivated in Shobrakhit and Etay El-Baroud in the second season (Table 2).

Concerning Giza 86, the highest mean value of the lea product was reached by the highest cotton grade (G/FG) of Sidi Salem. The highest yarn elongation % was attained from the highest lint grade (G+1/4) of Biyala and Disouq, respectively.

The highest card waste value (%) was recorded by the lowest grade (G-1/4) of Sidi Salem in both seasons (Table 4).

As for Giza 85, the highest mean values of single yarn strength were attained from the cotton grade (G+1/4) grown in Tala. The highest yarn elongation % were possessed by the lint grades (G/FG) and (G+1/4) of the cotton grown in Berket El-Sabea in the first season and by the highest lint grade (G/FG) grown in the same location in the second season. The highest mean values of the card waste percentage were reached by the lowest grade (G-1/4) of Quesna in both seasons (Table 6).

4. The contribution percentage HVI fiber properties to yarn quality:

The relative contribution percentage of the HVI fiber properties to yarn quality was determined from the values of the standard partial regression coefficients which are denoted by B* using the prementioned equations.

The resulted regression equation for Giza 88 cotton variety was:

Single yarn strength = 15.49 + 0.19 Mic + 3.69 MI – 0.21 CW (R^2 = 0.6021).

The resulted regression equation for Giza 86 cotton variety was:
Single yarn strength = 16.68 + 0.33 Mic – 0.29 CW, (R^2 = 0.4472).

The resulted regression equation for Giza 85 cotton variety was:
Single yarn strength = 10.92 + 0.91 Mic + 0.08 FL – 0.14 CW, (R^2= 0.4625).

It was found that contribution percentage of the major fiber properties was very weak. This is may be due to low variability in those fiber properties within the variety as they are varietal properties mainly affected by the genome.

Though, other factor has been used as an indicator for yarn quality such as Lea Product and the combined regression was done.

5. The combined regression equation:

The variance between the three varieties in the fiber properties will illustrate the relative importance of each property. So, we had to calculate the regression equation for the three cotton varieties.

The resulted regression equation was as follows:
Lea Product = - 552.46 - 111.66 Mic + 677.99 MI + 82.55 FL + 12.53 FS - 52.27 CW.
(R^2 = 0.8938)

This equation could be used to predict the lea product value from the HVI for fiber properties.

The resulted formula of Fiber Quality Index (FQI) was as follows:
FQI = 4.83 MI + 45.90 FL + 10.27 FS / 10.87 Mic + 17.51 CW.
Where: Mic. = Micronaire value. FS = Fiber Strength (g/tex.).
FL = Fiber Length (inches). MI = Maturity index.
CW = Card Waste percentage.
For simplicity, the fiber length in (mm) was converted to inches.

Data attained of the fiber quality index (FQI) was statistically analyzed to demonstrate the effect of the three studied factors i.e. location, grade and their interaction as follows:

5.1.1. Location effect on the fiber quality index:

Concerning Giza 88, the studied cotton locations varied significantly for fiber quality index in the first season, and in both seasons for Giza 86 and Giza 85.

5.1.2. Grade effect on the fiber quality index:

There were highly significant differences among the studied cotton grades in the fiber quality index (FQI) in the two studied seasons for Giza 88, Giza 86 and Giza 85.

5.1.3. Location and grade interaction effect on the fiber quality index:

The interactions of cotton growing locations x grade were highly significant for the fiber quality index (FQI) of the three studied cultivars, Giza 88, Giza 86 and Giza 85, in the two seasons.

The overall data were statistically analyzed to demonstrate the effect of the cotton variety, grade and their interaction on the fiber quality index (FQI) as follows:

5.2.1. Varity effect on the fiber quality index:

There were highly significant differences among the studied cotton varieties for the fiber quality index in the two seasons.

5.2.2. Grade effect on the fiber quality index:

Highly significant differences were found among the studied cotton grades for the fiber quality index in the two seasons.

5.2.3. Varity and grade interaction effect on the fiber quality index:

The variety and grade interaction was highly significant for fiber quality index in the first season only.

6. Predicting the lea product value:

The following equation could be used to predict the lea product value from the HVI fiber properties if the HVI is equipped with a mini-card machine.

Lea Product = - 552.46 - 111.66 Mic + 677.99 MI + 82.55 FL + 12.53 FS

- 52.27 CW.

If no mini-card machine is installed, the lea product equation will be the following:

Lea Product = - 1736.21 - 78.15 Mic + 1607.56 MI + 82.50 FL + 10.77 FS

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Table (1) Mean values of the studied Giza 88 HVI fiber properties as affected by grade and location interaction.

Location	Grade	Micronaire Value	Maturity Index	Color		Trash	
				Rd.%	+b	Count	Area
The first season 2006							
Shobrakhit	G/FG	4.30	0.95				
	G+1/4	3.80	0.91				
	GOOD	3.48	0.90	n.s.	n.s	n.s	n.s
	G-1/4	3.05	0.86				
Al-Rahmania	G/FG	3.91	0.93				
	G+1/4	4.28	0.93				
	GOOD	3.31	0.90	n.s	n.s	n.s	n.s
	G-1/4	3.23	0.87				
Etay El-Baroud	G/FG	4.15	0.94				
	G+1/4	3.53	0.92				
	GOOD	3.25	0.88	n.s	n.s	n.s	n.s
	G-1/4	3.17	0.87				
L.S.D.	0.05	0.19	0.01				
	0.01	0.26	0.02	n.s	n.s	n.s	n.s
The second season 2007							
Shobrakhit	G/FG	4.37	0.96	67.1	12.0	17	0.23
	G+1/4	3.70	0.91	67.0	12.2	38	0.53
	GOOD	3.70	0.92	67.3	12.1	49	1.27
	G-1/4	2.94	0.85	62.2	12.1	145	2.15
Al-Rahmania	G/FG	3.81	0.93	66.6	11.9	38	0.65
	G+1/4	4.43	0.96	66.0	12.1	59	0.95
	GOOD	3.73	0.92	64.4	12.1	46	0.90
	G-1/4	4.46	0.90	62.8	11.8	131	1.76
Etay El-Baroud	G/FG	4.34	0.95	68.1	11.8	30	0.66
	G+1/4	3.73	0.91	66.0	11.4	19	0.16
	GOOD	3.07	0.87	66.8	12.2	33	0.99
	G-1/4	3.07	0.86	61.8	11.6	124	2.17
L.S.D.	0.05	0.17	0.01	0.7	0.2	12	0.30
	0.01	0.22	0.02	1.0	0.3	16	0.41

Table (2): Mean values of studied Giza 88 yarn properties as affected by the location and grade interaction.

Location	Grade	Lea Product	Strength (g.tex)	Elongation (%)	Card Waste (%)
The first season 2006					
Shobrakhit	G/FG	3055	18.71	6.45	5.37
	G+1/4	2865	18.34	6.34	5.59
	GOOD	2845	18.19	5.73	7.55
	G-1/4	2629	17.61	6.46	8.56
Al-Rahmania	G/FG	3085	19.21	6.25	4.50
	G+1/4	2866	18.70	6.25	5.37
	GOOD	2866	18.44	5.86	4.43
	G-1/4	2761	17.33	5.73	8.69
Etay El-Baroud	G/FG	2961	19.47	6.45	4.45
	G+1/4	2908	18.54	6.45	5.52
	GOOD	2775	18.31	6.12	5.57
	G-1/4	2624	17.63	5.84	7.47
L.S.D.	0.05	69.80	0.40	0.09	0.42
	0.01	93.61	0.54	0.12	0.56
The second season 2007					
Shobrakhit	G/FG	n.s	18.68	6.46	3.47
	G+1/4		18.61	6.31	3.40
	GOOD		18.49	5.72	5.32
	G-1/4		17.44	6.44	7.60
Al-Rahmania	G/FG	n.s	18.45	6.25	3.29
	G+1/4		18.58	6.23	4.47
	GOOD		18.39	5.85	5.29
	G-1/4		17.31	5.73	7.34
Etay El-Baroud	G/FG	n.s	19.61	6.42	3.61
	G+1/4		18.69	6.42	3.68
	GOOD		18.41	6.15	5.57
	G-1/4		17.51	5.94	7.60
L.S.D.	0.05		0.36	0.03	0.32
	0.01		0.49	0.04	0.43

Table (3): Mean values of the studied Giza 86 fiber HVI properties as affected by the location and grade interaction.

Location	Grade	Micronaire Value	Maturity Index	U.H.M Length (mm)	Length Uniformity	Short Fiber Index (SFI)	Color		Trash	
							Rd.%	+b	Count	Area
The first season 2006										
Sidi	G/FG	4.25	0.93		85.9		75.9		18	0.19
Salem	G+1/4	3.97	0.92	n.s	86.4	n.s	76.2	n.s	35	0.41
	GOOD	3.83	0.90		84.3		74.0		32	0.49
	G-1/4	3.83	0.90		85.1		70.9		67	0.95
Disouq	G/FG	4.02	0.92		84.4		76.2		33	0.36
	G+1/4	4.00	0.92	n.s	86.2	n.s	75.5	n.s	44	0.57
	GOOD	4.21	0.93		87.8		76.3		28	0.25
	G-1/4	3.94	0.92		86.1		74.2		45	0.59
Biyala	G/FG	4.38	0.95		87.5		79.2		17	0.27
	G+1/4	4.22	0.93	n.s	85.5	n.s	78.5	n.s	22	0.40
	GOOD	3.91	0.91		86.1		73.3		43	0.96
	G-1/4	3.72	0.91		85.4		70.4		104	1.26
L.S.D.	0.05	0.15	0.01		1.8		1.9		22	0.36
	0.01	0.20	0.02		2.4		2.6		30	0.48
The second season 2007										
Sidi	G/FG	4.30	0.94	32.13		4.3	77.6	9.1	24	0.32
Salem	G+1/4	3.91	0.91	31.31	n.s	6.1	74.9	9.6	35	0.40
	GOOD	3.89	0.91	30.88		5.7	72.8	8.9	49	0.82
	G-1/4	3.69	0.90	32.65		6.2	71.8	9.6	57	0.70
Disouq	G/FG	3.98	0.92	32.31		6.4	76.9	9.5	26	0.27
	G+1/4	4.07	0.92	30.98	n.s	5.1	75.5	9.2	41	1.22
	GOOD	3.99	0.93	33.45		6.0	74.1	9.5	36	1.02
	G-1/4	4.02	0.93	31.97		4.2	72.0	9.0	51	1.14
Biyala	G/FG	4.27	0.94	31.91		5.1	78.9	9.5	11	0.09
	G+1/4	4.58	0.95	31.98	n.s	5.4	78.6	9.5	23	0.16
	GOOD	4.15	0.93	31.83		5.0	73.1	9.7	38	0.81
	G-1/4	4.00	0.92	32.21		5.9	69.9	9.7	68	1.18
L.S.D.	0.05	0.11	0.01	0.93		1.7	0.4	0.2	6	0.09
	0.01	0.15	0.02	1.25		2.2	0.5	0.3	8	0.12

Table (4): Mean values of studied Giza 86 yarn properties as affected by the location and grade interaction.

Location	Grade	Lea Product	Single Yarn Elongation (%)	Card Waste (%)
The first season 2006				
Sidi Salem	G/FG	2480	5.83	5.44
	G+1/4	2440	5.84	5.60
	GOOD	2320	5.74	6.30
	G-1/4	2285	5.44	7.62
Disouq	G/FG	2478	5.84	4.48
	G+1/4	2360	5.85	4.68
	GOOD	2342	5.68	6.42
	G-1/4	2260	5.45	7.54
Biyala	G/FG	2462	5.86	4.32
	G+1/4	2348	5.82	5.49
	GOOD	2280	5.65	5.47
	G-1/4	2250	5.32	7.57
L.S.D.	0.05	43	0.06	0.38
	0.01	58	0.08	0.51
The second season 2007/2008				
Sidi Salem	G/FG	n.s	5.84	4.61
	G+1/4		5.83	4.42
	GOOD		5.74	5.63
	G-1/4		5.43	7.49
Disouq	G/FG	n.s	5.87	4.49
	G+1/4		5.84	4.53
	GOOD		5.63	5.59
	G-1/4		5.43	7.34
Biyala	G/FG	n.s	5.86	3.69
	G+1/4		5.83	3.49
	GOOD		5.63	5.43
	G-1/4		5.32	7.42
L.S.D.	0.05		0.04	0.39
	0.01		0.06	0.53

Table (5): Mean values of the studied Giza 85 HVI fiber properties as affected by the location and grade interaction.

Location	Grade	Mic. Value	Matunty Index	Short Fiber Index (SFI)	Color		Trash	
					Rd.%	+b	Count	Area
The first season 2006								
Tala	G/FG	3.42	n.s	n.s	75.9	8.2	31	0.36
	G+1/4	3.92			79.0	8.8	15	0.14
	GOOD	3.37			73.5	8.5	56	0.67
	G-1/4	3.07			72.6	8.8	85	0.78
Berket	G/FG	3.33	n.s	n.s	76.5	9.0	21	0.23
El-Sabea	G+1/4	3.81			75.2	8.4	31	0.49
	GOOD	3.12			72.6	8.6	85	1.22
	G-1/4	3.09			74.6	8.6	44	0.59
Quesna	G/FG	3.48	n.s	n.s	76.6	8.5	52	0.63
	G+1/4	3.24			77.2	8.4	48	0.36
	GOOD	3.27			72.1	8.9	68	0.67
	G-1/4	2.97			69.4	9.1	67	0.97
L.S.D.	0.05	0.25			0.9	0.3	12	0.18
	0.01	0.33			1.2	0.4	16	0.25
The second season 2007/2008								
Tala	G/FG	3.47	0.91	5.1	75.5	8.8	32	n.s
	G+1/4	3.79	0.93	5.0	75.7	9.4	33	
	GOOD	3.26	0.87	7.2	73.8	9.0	60	
	G-1/4	3.32	0.87	6.1	71.6	9.4	59	
Berket	G/FG	3.44	0.91	5.8	74.1	9.0	47	n.s
El-Sabea	G+1/4	2.96	0.85	5.8	73.7	8.8	71	
	GOOD	3.50	0.88	5.5	75.9	8.9	56	
	G-1/4	3.02	0.87	5.1	73.8	8.9	53	
Quesna	G/FG	3.28	0.91	6.2	75.4	9.0	39	n.s
	G+1/4	3.38	0.85	6.7	76.1	9.0	38	
	GOOD	3.35	0.88	7.5	74.8	8.7	51	
	G-1/4	3.39	0.87	4.9	70.2	9.4	89	
L.S.D.	0.05	0.18	0.04	1.6	1.8	0.3	10	
	0.01	0.24	0.05	2.1	2.4	0.4	20	

Table (6): Mean values of studied Giza 85 yarn properties as affected by the location and grade interaction.

Location	Grade	Lea Product	Strength (g.tex)	(%)	Card Waste(%)
The first season 2006					
Tala	G/FG	2372	16.32	5.64	4.42
	G+1/4	2281	16.63	5.63	5.66
	GOOD	2122	15.39	5.36	6.60
	G-1/4	1951	15.53	5.06	7.48
Berket	G/FG	2311	15.49	5.73	4.50
El-Sabea	G+1/4	2250	15.57	5.73	4.53
	GOOD	2147	15.70	5.44	7.70
	G-1/4	1980	14.52	5.35	8.39
Quesna	G/FG	2431	15.69	5.65	4.68
	G+1/4	2287	15.67	5.63	5.38
	GOOD	2155	15.44	5.33	6.30
	G-1/4	2065	14.63	5.25	8.41
L.S.D.	0.05	50	0.37	0.04	0.36
	0.01	68	0.49	0.05	0.49
The second season 2007					
Tala	G/FG	n.s	16.35	5.65	3.36
	G+1/4		16.43	5.65	3.53
	GOOD		15.28	5.33	5.49
	G-1/4		15.40	5.14	7.39
Berket	G/FG	n.s	15.50	5.74	3.60
El-Sabea	G+1/4		15.40	5.73	3.35
	GOOD		15.52	5.45	5.53
	G-1/4		15.35	5.33	7.31
Quesna	G/FG	n.s	15.61	5.65	3.68
	G+1/4		15.61	5.63	4.51
	GOOD		15.56	5.31	5.39
	G-1/4		14.61	5.21	7.45
L.S.D.	0.05		0.41	0.03	0.37
	0.01		0.55	0.05	0.50

الملخص العربى

تأثير منطقة الزراعة ومستوى القطن الزهر على معامل جودة الألياف للقطن المصرى

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اختبرت خواص الألياف للأصناف جيزة ٨٨ ، جيزة ٨٦ وجيزة ٨٥ لعينات من ثلاث مناطق لكل صنف ومن كل منطقة أربع رتب بجهاز HVI Spectrum II وتم غزلها حلقيا على نمرة ٦٠ إنجليزى مع اس برم ٣،٦ لدراسة العلاقة بين خواص الألياف و مؤشرى جودة الخيط للموسمين ٢٠٠٦ و ٢٠٠٧ . تم تحليل الإرتداد المتعدد multiple regression analysis ونسبة إسهام خواص الألياف فى مؤشرى جودة الخيط بإستخدام الكمبيوتر .

أوضحت النتائج المتحصل عليها أن قراءة الميكرونير والمتانة قد تأثرتا معنويا بمنطقة الزراعة فى الموسمين بينما تأثرت الإستطالة معنويا فى الموسم الأول وتأثر كل من قراءة الميكرونير ومعامل النضج ودرجة الإصفرار وعدد الشوائب معنويا فى الموسم الثانى فقط.

أعلى القيم لكل من المتانة والإستطالة فى الموسم الأول بالإضافة إلى قراءة الميكرونير ومعامل النضج ومعامل إنتظام الشعيرات والمتانة وعدد الشوائب فى الموسم الثانى حققتها أقطان منطقة الرحمانية ، فى حين أن أعلى متوسط لدرجة الإصفرار سجلتها أقطان منطقة شبراخيت فى الموسم الثانى.

أعلى القيم لخواص الألياف سجلتها أعلى الرتب المدروسة (ج/فج) ثم انخفضت هذه القيم بإنخفاض الرتبة فيما عدا عدد ومساحة الشوائب ونسبة عوادم الكارد فقد إرتفعت بإنخفاض الرتبة . كان التفاعل بين منطقة الزراعة والرتبة معنويا فى حالة قراءة الميكرونير ومعامل النضج فى الموسمين وفى حالة المتانة ونسبة الإنعكاس ودرجة الإصفرار وعدد ومساحة الشوائب فى الموسم الثانى فقط ، فى حين أن هذا التفاعل كان معنويا فى الموسمين بالنسبة لمعظم خواص الخيط التى درست.

تم الوصول إلى أن أهمية الصفات الوراثية للصنف تتضاءل نظرا لتجانس الصنف مما أدى إلى إنخفاض التباين فيما بين قراءت هذه الصفات داخل الصنف ، ولتحديد الأهمية النسبية لصفات تيلة القطن تمت دراسة الثلاث أصناف معا حيث يمثلون أقسام الطول المختلفة ليكون هناك تباين فى قراءات صفات التيلة. وقد تم التوصل لمعادلة لحساب معامل جودة الألياف وهى :

FQI = 4.83 MI + 45.90 FL + 10.27 FS / 10.87 Mic + 17.51 CW.

حيث :

MI : معامل النضج .

FL : طل التيلة .

FS : المتانة .

Mic : قراءة الميكرونير .

CW : نسبة عادم الكرد .