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The relationship between seed cotton grade and seed grid adjustment on ginning efficiency and fiber quality of the Egyptian cotton cultivar "Giza 86"

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ABSTRACT

The effect of seed cotton grade, seed grid adjustment and their combination on ginning efficiency and fiber quality of cotton cultivar ‹Giza 86› was investigated. Therefore, three seed cotton grades of the given cotton cultivar (long staple) as Good to fully good (G/FG), Good (G) and Fully Good fair to Good (FGF/G) and three seed grid adjustments as 1.00, 1.25 and 1.50 lineal were used. The obtained results revealed that the lowest seed cotton grade, i.e. Fully Good Fair to Good (FGF/G), gave the lowest values of the studied ginning efficiency parameters, i.e. gin stand capacity (0.79 kg lint /inch/h.), Lint percentage (35.21%), lint grade code (21.88) and the highest value of the ginning time (1.73 h./kentar). The medium seed grid adjustment (1.25 lineal) led to the highest mean value of the gin stand capacity (0.96 kg/inch/h.) and the lowest mean value of the ginning time (1.50 h./kentar). Likewise, the highest mean value of lint grade code (26.16) was reached due to using the wider seed grid adjustment (1.50 lineal). The highest seed cotton level (Good / Fully Good) for Giza 86 cotton cultivar registered the highest mean values of the spinning consistency index (SCI), upper half mean length (UHML), length uniformity index (UI), fiber bundle strength, maturity index, micronaire reading, and fiber reflectance degree (Rd %). In addition, the lowest mean values of short fiber index (SFI), fiber elongation (%), trash count, and trash area compare were taken place due to the other studied seed cotton grades. the interaction between the seed cotton grade and seed grid adjustment was not significant ($p > 0.05$) for most fiber properties tested by HVI of studied cotton cultivar ‹Giza 86›.

Keywords: Seed cotton grade; Seed grid adjustment; Fiber properties; Ginning efficiency

Introduction

The farmers are the direct users of cotton gins, while consumers and textile mills are the ultimate beneficiaries. The ginner has the challenging task to satisfy both producers and the textile industry via preserving and improving the quality of cotton to meet the demands of the textile industry (Delhom *et al*., 2017). Grading systems are intended to assign an economic value to the bales that relates to textile mill demands and the quality of the end product. The main function of the modern cotton ginning is cotton fiber separation from seeds and maintaining or attaining the cotton fiber quality. Cotton gin stands should produce a good fiber quality for the raw cotton which increases, greatly, its value for the producer and fulfillment the textile industry and consumer requirements at the end. Designing, operating and maintaining today's cotton gin plant is a highly specialized field that continues to demand increasing technical expertise and skills (Hughs, 2016). Nevertheless, cotton quality is affected by every production step including variety selection being ginned, cultural practices, picking method, storing procedure, and ginning process. Though weathering, handling, ginning, and manufacturing reduce the natural quality of cotton. Also, occurring problems at any of the stage aforementioned during the production process can result in irrevocable harm which affect negatively the fiber's quality and then the producer income returns (Solieman, 2016). The capacity of the ginning system depends on the operating condition and adjustment of the gin stands. It is very important to choose the ginning technology which affects thier performance. Choice of the optimal type of ginning technology, also, has a significant impact on lint quality because it is less damaging to the fiber (Gérald and Nicolas, 2010). All Egyptian cottons are roller gin ginned to preserve its unique fiber properties and maintain their quality. Roller gins are considerably slower, but delicate to the fibers; therefore, they are commonly used as extra long staple cotton (ELS) and long staple cotton (LS), also for some upland cottons in India and Turkey. The perfect ginning operation should be

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performed either without or with the slightest injury to either seeds or fibers. Seed grid adjustment, significantly, affect gin stand capacity, ginning time and lint grade (Ibrahim, 2010 a). Ginning can affect lint quality, roller ginning better out-turn and produces superior lint that is longer, and has fewer short fibers. The grade of cotton is, mainly, associated with harvesting methods, storage and ginning practices, capacity of the roller gin and the quality of the lint depend on the operating condition and the adjustments of the gin stand. If gin stands are operated above the design capacity, the quality of the cotton may be damaged (Gérald, 2008). Cotton grade is usually determined according to three factors: colour, non-lint content and preparation. Colour of raw cotton is an important indicator for quality which is in principle a varietal characteristic determined by the genotype, yet it is affected by the environmental conditions which would induce varying extent of discoloration. Likewise, the colour is one of the most important factors that must be considered in grade determination and preparing grade standards, particularly in the higher grades. Colour of raw cotton is affected by several factors, namely: genetically and weathering conditions (Abdel-Aal, 2006).

In general, cotton fiber quality is mainly affected by seed cotton grade and cultivar. Therefore, the cultivars and cotton grade's average fiber properties with yarn quality are correlated. The highest seed cotton grade gave the highest gin stand capacity, ginning out-turn and micronaire reading (Ewida, 1992). All studied ginning efficiency parameters were, significantly, affected by seed cotton level except ginning out-turn (Batisha, 2005). Gin stand capacity is more affected by the roller gin types. The highest values of gin stand capacity, ginning out-turn, lint grade, micronaire value, fiber elongation (%) and reflectance degree (Rd %) were taken place due to process the highest seed cotton level as, Good to Fully Good (Ibrahim (2010 b). Roller ginned fibers were characterized with longer (UHML mm), more uniformity (%), fewer short fibers and fibrous neps, as well as stronger with higher elongation, and with slight but significant smaller seed coat nep and total trash size. However, roller ginned fiber contained, significantly, more trash, dust and an inferior visual color grade (Vander-Sluijs, 2015). In addition, Etman (2018) and El-Banna (2019) indicated that length parameters of fiber, considerably, depend on the used cotton cultivar and grade.

The objective of this research is under taken to investigate the effect of seed grid adjustment and seed cotton grade of cotton variety‹Giza 86› on ginning efficiency and fiber properties.

Materials and Methods

Seed cotton grades and seed grid adjustment are among the most factors affecting on gin stand capacity, fiber properties and lint grades. This study was carried out at Plant Production Department; Faculty of Agriculture (Saba Basha), Alexandria University, Egypt, during 2018/2019 season using one Egyptian cotton cultivar‹Giza 86› was introduced by Cotton Research Institute in 1995. Three seed cotton grades; namely, Good to fully good (G/FG), Good (G) and Fully Good fair to Good (FGF/G) were considered as independent variable. A seed cotton sample of 75 kilograms was taken from each seed cotton grade, representing the original stock of Modern Nile Cotton Company of the commercial cotton received from Damanhour region, Al-Beherah Governorate. The second independent variable was three seed grid adjustments; i.e., 1.00, 1.25 and 1.50 lineal), (1 lineal = 0.125 inch = 3.2 mm). The bulk sample (27 kg) of each seed cotton grade was divided into nine sub-samples (3 kg/replicate), representing the various combinations of both variables (nine treatments). The studied sub-samples were ginned using the conventional single roller gin stand [a roll covered with natural leather (McCarthy roller gin)] in the same gin plant. The dependent variable was represented by ginning efficiency and fiber quality and expressed as follows:

1. Ginning efficiency parameters:

These parameters were calculated according to the following equations, proposed by **Chapman and Stedronsky (1959)**:

1.1. Gin stand capacity (G.S.C.), which expressed as the lint weight (kg) per inch per hour, as follows:

$$\text{Gin stand capacity (G.S.C.)} = \frac{60}{\text{Time (min)}} \times \frac{\text{weight of ginned lint (kg)}}{\text{Length of roller (inch)}} = \text{(kg lint /inch/h.)}$$

(Length of roller = 40 inch of the McCarthy roller gin stand)

1.2. Ginning time (G.T.): was determined according the following equation:

$$\text{Ginning time (G.T.)} = \frac{\text{Ginning time (minute)}}{\text{Seed cotton weight (kg)}} \times \frac{157.5}{60} \quad = \quad \text{(h. / kentar)}$$

(1 metric seed cotton kentar = 157.5 kilograms)

1.3. Lint percentage (%), which determined according the following equation:

$$\text{Lint percentage (L.P.)} = \frac{\text{Lint cotton weight (kg)}}{\text{Seed cotton weight (kg)}} \times 100 \quad = \quad (\%)$$

1.4. Lint grade of each sample was determined by a three export classers, at (CATGO), Alexandria. For statistical analysis, the grades were converted to code numbers according to Sallouma (1970), as shown in the following Table (1):

Table 1: lint cotton grades, their abbreviation and their codes.

Grade	Abbreviation	Code
Extra	Extra	41
Fully good/Extra	FG/Extra	37
Fully good	FG	33
Good/fully good	G/FG	29
Good	G	25
Fully good fair/good	FGF/G	21
Fully good fair	FGF	17
Good fair/fully good fair	GF/FGF	13
Good fair	GF	9
Fully fair/good fair	FF/GF	5
Fully fair	FF	1

Each ⅛ grade is represented by one mark.

2. Fiber properties as determined by H.V.I. instrument:

Representative sample of lint cotton (about 200 grams) was drawn for determining the fiber properties. The High Volume Instrument (HVI) Spectrum II system was used to determine the fiber properties at the Laboratories of Cotton Arbitration for Testing General Organization (CATGO), Alexandria, Egypt.

All samples were opened and left for 24 hours at least under the standard conditions of 65% ± 2% relative humidity and 20 ± 2°C temperature before being tested, and following properties were determined:

2.1. Fiber upper half mean length (UHML; mm.).
2.2. Length uniformity index (UI, %).
2.3. Short fiber index (SFI, %).
2.4. Fiber bundle strength (Str., g/tex).
2.5. Fiber elongation (Elog., %).
2.6. Micronaire reading (Mic.).
2.7. Maturity index (Mat., %).
2.8. Fiber brightness or reflectance degree (Rd %).
2.9. Chroma or degree of yellowness (+b).
2.10. Trash area (%).
2.11. Trash count.
2.12. Spinning consistency index (SCI).

3. Lint (%) and non-lint (%): were determined by Shirley analyzer Instrument**.**

4. Statistical procedures

This investigation was conducted in a completely randomized design with three replicates and analyzed as a factorial experiment according the procedure of Snedecor and Cochran (1967). The data was computed using the CoStat 6.311 (1998-2005) as statistical program, to test differences among studied mean values of treatments the least significant difference (L.S.D.) at 0.05 level of probability was used.

Results and Discussion

1. Ginning efficiency parameters:

The mean values of the ginning efficiency parameters, i.e. gin stand capacity, ginning time, lint percentage (%) and lint grade code for the cotton cultivar ' Giza 86 ' in the studied season (2018/2019), are shown in Table (2).

The obtained results revealed that the main effect of the seed cotton grade treatments which affect significantly ($p < 0.05$) all studied ginning efficiency parameters.

It is obvious that the lowest seed cotton grade Fully Good Fair to Good (FGF/G); gave the lowest values for the studied ginning efficiency parameters and the highest value of the ginning time. This result may be achieved due to its lower seed cotton grade, which usually contains the lowest proportion of the big fluffy cotton locks, the highest proportion of trash content and tight locks. In this connection, the recorded results are in compatible with those of Ibrahim (2010 b) and Solieman (2016) who stated that the highest seed cotton grade gave the highest ginning out-turn (%) and gin stand capacity and the lowest value of the ginning time.

In terms of the main effect of seed grid adjustment, results outlined in the same Table, reveal that most studied ginning efficiency parameters were significantly ($p < 0.05$) affected by seed grid adjustment. Whereas, the differences in lint percentage was insignificantly due to the seed grid adjustment effect, as given in Table (2).

Table 2: Mean values of the ginning efficiency parameters of 'Giza 86' cotton cultivar as affected by seed cotton grade, seed grid adjustment and their interaction during season 2018/2019.

Treatments \ Characters	Gin stand capacity (kg lint/inch/h.)	Ginning time (h./kentar)	Lint (%)	Lint grade code
		Seed cotton grade (A)		
Good / Fully Good	1.06 a	1.38 c	37.33 a	29.33 a
Good	0.89 b	1.57 b	35.91 b	25.61 b
Fully Good Fair/Good	0.79 c	1.73 a	35.21 c	21.88 c
L.S.D. 0.05	**0.039**	**0.071**	**0.375**	**0.426**
		Seed grid adjustment (B)		
1.00 (lineal)	0.89 b	1.61 a	36.09 a	25.05 c
1.25 (lineal)	0.96 a	1.50 b	36.38 a	25.61 b
1.50 (lineal)	0.90 b	1.57 a	35.98 a	26.16 a
L.S.D. 0.05	**0.039**	**0.071**	**ns**	**0.426**
		Interaction		
A × B	**ns**	**ns**	**ns**	**ns**

- Means designated by the same letter within each column are not significantly different.
- ns: Not significant.

It is obvious that the medium seed grid adjustment (1.25 lineal) declared the highest mean value of the gin stand capacity (0.96 kg lint/inch/h.) and the lowest mean value of the ginning time (1.50 h./kentar). While, the highest mean value of lint grade code (26.16) was reached due to using the wider seed grid adjustment (1.50 lineal). Meanwhile, the lowest mean values of gin stand capacity (0.89 kg lint/inch/h.), lint grade code (25.05) and the highest mean value of ginning time (1.61 h./kentar) were attained owing to the ginning at (1.00 lineal). These results may be achieved due to the high speed in seed cotton input, and lint cotton output because of the clearness of ginning zone. It could be concluded that the lint grade code was increased by increasing the seed grid adjustment from (1.00 to 1.5 lineal). This results could be explained on the basis that the largest seed grid gave the chance to tight locks and trash (non-lint content) to fall down the gin stand before ginning and *vice versa*.

Not significant ($p > 0.05$) interaction was found between seed cotton grade and seed grid adjustment (A × B) for all studied ginning efficiency parameters of the cotton cultivar ‹Giza 86' (Table 2).

2. Fiber properties tested by H.V.I. instrument:

Results presented in Table (3) indicate that the fiber properties tested by HVI affected at highly significant ($p < 0.01$) level by seed cotton grade of ‹Giza 86' cotton cultivar.

It is clear that the highest seed cotton grade (Good / Fully Good) for ‹Giza 86' cotton cultivar registered the highest mean values of the spinning consistency index (SCI), upper half mean length (UHML), length uniformity index (UI), fiber bundle strength, maturity index, micronaire reading and fiber reflectance degree (Rd %), in addition, the lowest mean values of short fiber index (SFI), fiber elongation (%),trash count and trash area compared to the other studied seed cotton grades. It is obvious that the better grade of seed cotton had high fibers properties. While the short fiber content and yellowness (+b) correspondingly increased as the cotton grade decreased. These results may be happened due to increasing the mature fiber and fiber elongation percentage in the higher grades of cotton seed which contain the healthy lucks and *vice versa*.

It is known that micronaire reading is indirect measure of fineness, because the micronaire reading is an inversely relationship to diameter of fiber. The factors such as the cross-sectional shape and surface morphology are likely to influence the micronaire reading. The significant of this finding is that these factors are largely affected by the degree of fiber maturity. This finding suggests that in some situations the micronaire reading may imply a combined index of both fiber fineness and maturity.

As for degree of yellowness (+b), the highest mean value was recorded for the lowest seed cotton grade (Fully Good Fair/Good). On the other hand, the lowest mean value of the same trait was possessed by the seed cotton grade (Good) for ‹Giza 86' cotton cultivar. These results are in agreement with those obtained by Abd El-Glil (2001), Batisha (2005) and Solieman (2016).

Results shown in Table (3) manifest a different behavior for the effect of seed grid adjustment on the fiber properties tested by HVI of studied cotton cultivar. It is obvious that the fiber bundle strength, fiber reflectance degree (Rd %) and degree of yellowness (+b) were significantly ($p < 0.05$) affected by the seed grid adjustment for studied cotton cultivar.

The highest mean values of fiber bundle strength, fiber reflectance degree (Rd %) and degree of yellowness (+b) were attained by ginning cottons at (1.50 lineal) and (1.00 lineal), respectively, and the lowest mean values of the same traits were recorded by the narrower (1.00 lineal) and wider (1.50 lineal) seed grid adjustments, consecutively. It could be concluded that fiber bundle strength, degree of yellowness (+b) and fiber reflectance degree (Rd %) directly affected by any mechanical treatment during the ginning process and also related to the grade of seed cotton.

Likewise, results tabulated in Table (3) declared that the first order interaction between the seed cotton grade and seed grid adjustment (A x B) was not significant ($p > 0.05$) for most fiber properties tested by HVI of studied cotton cultivar ‹Giza 86'.

The mean values of the fiber reflectance degree (Rd %) was influenced by the interaction between the seed cotton grade and seed grid adjustment were shown in Table (4). The highest seed cotton grade (Good / Fully Good) with the wider seed grid adjustment (1.50 lineal); recorded the highest mean value (79.00 %) for fiber reflectance degree (Rd %). On the other extreme, the lowest mean value (63.26 %) of the same trait was recorded using the lowest seed cotton grade (Fully Good Fair/Good) with the narrower seed grid adjustment (1.00 lineal).

3. Estimation of lint (%) and non-lint (%) contents.

Lint (%) and non-lint (%) by Shirley analyzer were significantly ($p < 0.05$) affected the seed cotton grade of ‹Giza 86' cotton cultivar, as shown in Table (5).In the same Table, it is clear that the highest seed cotton grade (Good to Fully Good); led to the highest mean value (96.94 %) of the lint percentage and the lowest mean value (3.35 %) of the non-lint percentage. Hence, the lint percentage was correspondingly increased by increasing the seed cotton grade as a direct positive correlation, while the non-lint percentage was gradually, decreased in an opposite correlation.

Table 3: Mean values of the H.V.I fiber properties of ‹Giza 86' as affected by seed cotton grade, seed grid adjustment and their interaction during ginning season 2018/2019.

Characters / Treatments	SCI	UHML (mm)	Uniformity index (%)	Short fiber index (%)	Fiber strength (g/tex)	Fiber elongation (%)	Maturity index (%)	Micronaire reading	Rd (%)	+ b	Trash count	Trash area (%)
Seed cotton grade (A)												
Good / Fully Good	197.33 a	32.80 a	87.62 a	5.70 b	42.21 a	5.08 b	0.88 a	4.63 a	77.65 a	9.52 b	29.00 c	0.39 c
Good	171.55 b	30. 80 b	84.72 b	6.65 a	38.28 b	5.78 a	0.86 b	3.85 b	71.81 b	9.31 b	67.00 b	1.06 b
Fully Good Fair/Good	155.66 c	30.74 b	84.42 b	6.87 a	35.43 c	5.95 a	0.85 b	4.01 b	63.78 c	10.38 a	133.44 a	2.38 a
L.S.D. 0.05	**8.583**	**0.778**	**0.941**	**0.359**	**1.495**	**0.289**	**0.006**	**0.173**	**0.656**	**0.340**	**18.00**	**0.413**
Seed grid adjustment (B)												
1.00 (lineal)	179.00 a	31.35 a	85.82 a	6.32 a	37.87 b	5.57 a	0.86 a	4.21 a	70.80 b	10.01 a	71.77 a	1.20 a
1.25 (lineal)	174.44 a	31.43 a	85.76 a	6.40 a	38.11 b	5.68 a	0.86 a	4.17 a	70.81 b	9.61 b	71.00 a	1.26 a
1.50 (lineal)	171.11 a	31.55 a	85.17 a	6.51 a	39.94 a	5.56 a	0.86 a	4.10 a	71.64 a	9.60 b	86.66 a	1.37 a
L.S.D. 0.05	**ns**	**ns**	**ns**	**ns**	**1.495**	**ns**	**ns**	**ns**	**0.656**	**0.340**	**ns**	**ns**
Interaction												
A × B	**ns**	**ns**	**ns**	**ns**	**ns**	**ns**	**ns**	**ns**	*	**ns**	**ns**	**ns**

- Means designated by the same letter within each column are not significantly different
- ns: Not significant.
- *: Significant at 0.05 level of probability.
- UHML: Upper Half Mean Length.
- SCI: Spinning consistency index.

Table 4: The interaction between seed cotton grade and seed grid adjustment (A × B) for reflectance degree (Rd %) of ‹Giza 86› during 2018/2019 ginning season.

Variables		Reflectance degree (Rd %)
Seed cotton grade (A)	**Seed grid adjustment (B)**	
Good / Fully Good	1.00 (lineal)	76.96
	1.25 (lineal)	77.00
	1.50 (lineal)	79.00
Good	1.00 (lineal)	71.63
	1.25 (lineal)	71.66
	1.50 (lineal)	72.13
Fully Good Fair/Good	1.00 (lineal)	63.26
	1.25 (lineal)	63.83
	1.50 (lineal)	64.26
L.S.D. $_{0.05}$		**1.136**

These results were in similar with those obtained by Abdel-Aal (2006) who found out that non-lint content as measured by the Shirley analyzer was affected by seed cotton grades.

The seed grid adjustment had a highly significant ($p < 0.01$) effect on lint percentage and non-lint percentage by Shirley analyzer of ‹Giza 86› cotton cultivar, as presented in Tables (5). It could be notice that the wider seed grid adjustment (1.50 lineal); gave rise to the highest mean value (94.82 %), but the narrow one (1.00 lineal); resulted in the lowest mean value (92.92 %) of the lint percentage for the given cultivar. On the contrary, the highest mean value (7.07 %) of the non-lint percentage was obtained due to using the narrower seed grid adjustment (1.00 lineal) and the lowest mean value (5.17 %) was obtained due to using the wider seed grid adjustment (1.50 lineal).
Regarding the results presented in Table (5), it is clear that the first order interaction between the seed cotton grade and seed grid adjustment, (A x B) was significant ($p < 0.05$) for the lint percentage and non-lint percentage by Shirley analyzer of ‹Giza 86› cotton cultivar.

It is worthy to mention that using the wider seed grid adjustment (1.50 lineal) with the highest seed cotton grade (Good to Fully Good); recorded the highest mean value of the lint percentage (98.13 %) and the lowest mean value of the non-lint percentage (1.86 %). Meanwhile, the narrower seed grid adjustment (1.00 lineal) with the lowest seed cotton grade (Fully Good Fair/Good); brought about the lowest mean value of the lint percentage (89.63 %) and the highest mean value of the non-lint percentage (10.36 %), as shown in Table (6). The attained results could be explained on the basis that the seed grid adjustment; gave more chance to remove more amounts of trash and foreign matter, surpassing the normal position of the seed grid adjustment. Foreign matter content and trash content in the lint as measured by the Shirley analyzer; increased as the seed grid adjustment and seed cotton grade decreased.

Table 5: Mean values of the lint (%) and non-lint (%) of Shirley analyzer as affected by seed cotton grade, seed grid adjustment and their interaction during ginning season 2018/2019.

Characters / **Treatments**	**Lint (%)**	**Non lint (%)**
	Seed cotton grade (A)	
Good / Fully Good	96.64 a	3.35 c
Good	94.18 b	5.81 b
Fully Good Fair/Good	90.90 c	9.10 a
L.S.D. $_{0.05}$	**0.456**	**0.456**
	Seed grid adjustment (B)	
1.00 (lineal)	92.92 c	7.07 a
1.25 (lineal)	93.98 b	6.01 b
1.50 (lineal)	94.82 a	5.17 c
L.S.D. $_{0.05}$	**0.456**	**0.456**
	Interaction	
A × B	**	**

-Means designated by the same letter within each column are not significantly different.
- **: Significant at 0.01 level of probability.

Table 6: The interaction between seed cotton grade and seed grid adjustment (A × B) for lint (%) and non-lint (%) by Shirley analyzer of ‹Giza 86› during 2018/2019 ginning season.

Variables		Lint (%)	Non-lint (%)
Seed cotton grade (A)	**Seed grid adjustment (B)**		
Good / Fully Good	1.00 (lineal)	95.16	4.83
	1.25 (lineal)	96.63	3.36
	1.50 (lineal)	98.13	1.86
Good	1.00 (lineal)	93.96	6.03
	1.25 (lineal)	94.10	5.90
	1.50 (lineal)	94.50	5.50
Fully Good Fair/Good	1.00 (lineal)	89.63	10.36
	1.25 (lineal)	91.23	8.76
	1.50 (lineal)	91.83	8.16
L.S.D. $_{0.05}$		**0.790**	**0.790**

Conclusion

The obtained results clarified that the medium seed grid adjustment (1.25 lineal); gave rise to the highest mean value of the gin stand capacity and the lowest mean value of the ginning time. While, the highest mean value of lint grade code was reached due to using the wider seed grid adjustment (1.50 lineal). Concerning the HVI fiber properties showed an insignificant impact due to the seed grid adjustment on the most of fiber properties. The highest values of the gin stand capacity, lint percentage, lint grade code, upper half mean length, uniformity index, fiber strength, fiber maturity index and reflectance degree (Rd %) were recorded for the highest seed cotton grade (Good / Fully Good). Meanwhile, the highest mean values of yellowness degree (+b), trash area and trash count were recorded by the lowest seed cotton grade (Fully Good Fair/Good). These results could be came to conclude that improvement of ginning efficiency of the roller gin stand could be achieved via using the appropriate seed grid adjustment each cultivar; per se and better seed cotton grade to increase the gin stand capacity of studied Egyptian cotton cultivar ‹Giza 86›.

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