Egypt. J. of Appl. Sci., 37 (1-2) 2022 *18-28*

STABILITY ANALYSIS FOR NEW LINES OF MELON (*Cucumis melo* L.)

El- Sayed, A. A.
Department of Vegetables, Medicinal and Aromatic Plant Breeding,
Horti. Res. Inst., Agric. Res. Cen., Giza, Egypt.
E-mail - elsaiedamr39@yahoo.com

ABSTRACT

Six new promising lines of melon (*Cucumis melo* L.)Were evaluated under six environmental conditions (three sowing dates in two seasons of 2019 and 2020). A randomized complete block design (RCBD) with three replicates was used for each sowing date at Kaha Vegetable Research Farm, Qalubia Governorate, Horticulture Research Institute (HRI), Agricultural Research Center (ARC), Egypt. Data were recorded for some traits *i.e.*, average fruit weight, fruit length, fruit diameter, flesh thickness, fruit cavity, total soluble solids (TSS) and total yield. The significant mean squares due to environment (years × sowing dates) suggested that environment (years) considerably influenced on the genotypic performance. The interactions between genotypes and environments for traits were significant indicating that genotypes behaved differently under different years, significant mean square due to environments (linear) for traits indicating the differences between years (environment) and their considerable influence on these traits. Results showed that for fruit weight L-5 had a regression coefficient (bi) near one and deviation from regression 1 (S^2_d) not differant from zero. For flesh thickness results showed that L-1, L-3, L-5 had (bi) near solidarity and deviation from relapse, close to 1 (S^2d) not significantly different from zero. For total soluble solids (TSS) results showed that L-1, L-4 had (bi) close to 1 and (S^2d) not significantly different from zero. Concerning total yield results showed that L-1 and L-5 had significantly different (bi) near unity and deviation from the regression line, close (S^2d) not significantly different from zero.

Key Words: Cucumis melo, stability, variability, Genotype × Environment

INTRODUCTION

Melon (*Cucumis melo* L.) is a plant that is widely grown in Egypt. Melon is rich in nutrients, every 100 grams of fresh fruit meat contains 92.1% water, 0.5% protein, 0.3% fat, 6.2% carbohydrate, 0.5% fiber, and 350 IU vitamin A. Besides that, the economic value and promising prospects, both in the marketing of frui and seeds, make melon as one of the fruit commodities which is a priority in the agricultural sector **Daryono and Maryanto** (**2017).** This plant originated from the Mediterranean region

which is the area adjacent to West Asia, Europe, and Africa. Nevertheless, DNA sequences study showed that the melon's wild progenitor appeared in India . Melon plants then spread to the Middle East, Europe, and at 14th century was introduced in America . At the end of that, this plant was spread throughout the world, especially in tropical and subtropical regions. Seed companies have continuously developed various Cantaloupe cultivars to supply farms so that the demands of the growing markets can be met. However, the adoption of any of hybrids requires a prior evaluation of fruit yield and quality in order to ensure greater safety in the recommendation of hybrids for the various cultivation conditions **Nunes *et al*., (2005).**Traditionally, the methods used to study adaptability and stability considers the effects of genotypes as fixed. However, in recent years, the number of studies that consider the effect of genotypes as random has increased. Assuming the effects of genotypes as random allows for the obtainment of best linear unbiased predictions (BLUP) of the effects of genotypes and G × E .Studies on genotypes and their interactions with different environments are key as they make possible the identification of cultivars with high adaptability and stability, thus aiding researchers in recommending the most appropriate genotypes for a given region **Yan and Cereal** (**2011**).Now, a lot of hybrid melon cultivars have been produced as a result of seed technology development. Assembly of local melon seeds need to be conducted to meet the demand for high quality local seeds. Seeds can be assembled conventionally by crossing a parent who has the desired properties **Aristya and Daryono** (**2013**). Even so, in releasing new cultivars to market, it is necessary to have assurance that character of these cultivars have stable. Characters stability that required to be recognized especially is fruit characters. It is because of fruit is one of agricultural products which are bought and sold on the market. The stability characters should be tested on various types of location to ensure that the characters do not change in different types of location (**Daryono *et al*. 2015**).**Daryono *et al*. (2019)** found that phenotypic character of melon Meloni within 4th generation in the green house, 4th generation and 5th generation in field was stable, those characters are vertical around and thick of rind. Due to the different environmental conditions under which the hybrids are evaluated, an accentuated genotype-environmental interaction is expected to become apparent and likewise play important role in manifestation of phenotypic traits. **Daryono *et al*. (2019)** revealed that ISSR markers are helpful for evaluating genetic stability of new cultivars as well as for evaluating intra-species genetic variations. **Oliveira *et al*. (2019)**.Plant breeding is an effort to develop improved plant cultivars suited to the needs of consumer or farmers by creating and selecting superior plant phenotypes. The aim of this work was to evaluate the performance of melon inbred lines to determine the stability of them characters based on three different dates of planting.

MATERIALS AND METHODS

Six new promising lines of melon were evaluated under six environments. These environments resulted from combinations of two years with three sowing dates. Field experiments were conducted at Agricultural Research Center (ARC), Kaha Vegetable Research Farm, Qalyubia Governorate Egypt, during the growing seasons of 2019 and 2020 with three sowing dates (last week of February, first week of April and August) to study the genotypic and phenotypic stability of six melon genotypes. The soil of the experiment was clay loam. The recommended agricultural practices were done as for commercial melon productions. Lines L1 (H12), L2(G10), L3(A8), L4(H7), L5(H3), L6(A4) were produced by author of the present study from previous melon breeding program by selfing and selection during 6 generations and hybrid galia. The genotypes were arranged in a randomized complete block design with three replicates. Seeds were planted in the nursery before transplanting; when the seedlings were 21 days old they were transplanted. Each plot consisted of two rows with 5 m long and 1.75 m width. Seedlings were sown in hills at 50 cm apart. The following data were recorded: average fruit weight (kg), fruit height (cm), fruit diameter (cm), flesh thickness (cm), fruit cavity (cm), and were determined as the mean of 10 fruits randomly chosen from each EP. Total soluble solids (TSS) was determined of 5 yellow-ripe fruits / picking of each EP using a hand refractometer., and total yield was measured as weight of all harvested fruits at the yellow-netted ripe.

Pooled analysis of variance (ANOVA) was performed over environments. The genotypes were considered as the fixed factor and appropriate error terms were used to test the significance among environments, genotypes and the interactions between genotypes and environments as illustrated by **Gomez and Gomez (1984).** The phenotypic stability of the genotypes was measured using, the mean performance across the six environments, the linear regression (bi), the deviation from regression function **Eberhart and Russell** (**1966**) the data of each trait were statistically analyzed for stability according to **Eberhart and Russell (1966)**.

The combined analysis:

The data were subjected to statistical analysis to study the genotype × environment interaction, and to find out the implications of the confounding of $\delta^2 g \times y$ and $\delta^2 g \times d$ effects on variance components by three separately ways: (1) Dates effect on the variance components, using separate analysis of variance for each year over the found planting dates (2) Yearly effect using a separate analysis of variance for each date overall years. (3) The three factors combined analysis (G x D x Y). The combined (three factors) analyses of variances were calculated as outlined by **Little and Hills (1975).** Estimates of the variance components were obtained from the mean squares of the analysis of variance.

Statistical analysis: Data collected were subjected to statistical analysis using the normal (F, test). Means were compared using Least Significant Difference (LSD) according to the method described by **Gomez and Gomez (1984).**Coefficient of variability values were estimated depends on phenotypic (P.C.V) and genotypic (G.C.V) variances using the following formula as suggested by **Burton (1952).**

P.C.V. % = $\frac{\sqrt{vp}}{\bar{x}} \times 100$ G.C.V. % = $\frac{\sqrt{v_G}}{\bar{x}} \times 100$

Where, $\sqrt{vp}$ = phenotypic standard deviation, $\sqrt{v_G}$ = genotypic standard deviation and $\bar{x}$ = genotypes means.

Vg = MSG – MSE Vp = Vg + Ve

Vg = Genotypic variance, MSG = Mean square due to germplasm, MSE = Error mean square, Vp = Phenotypic variance, Vg= Genotypic variance, Ve = Error variance, i.e. MSE.

RESULTS AND DISCUSSION

Analysis of variance components

Differences among genotypes were significant for all the traits, indicating the presence of considerable genotypic variation in the germplasm material for these traits (Table 1). The significant mean squares due to environment (years × sowing dates) for all suggested that environments differ from one to another. The interactions between genotypes and environments for traits were significant indicating that genotypes behaved differently under different combined year × planting dates, Significant mean square due to environments (linear) for traits indicating the differences among (environments) and their considerable influence on these traits. These results are in line with those obtained by **Abd El-Salam *et al*. (2009) and Oliveira *et al*. (2019).**

Table (1) Estimations of mean squares of seven traits in melon.

S.O.V	DF	fruit weight	fruit length	fruit diameter	flesh thickness	fruit cavity	TSS	Total yield
Environments (years × dates)	5	0.17**	3.96**	2.97**	0.16*	1.20**	3.75**	8.70**
Genotypes	6	2.53**	77.88**	40.90**	11.79**	10.54**	12.65**	52.28**
Genotypes × Environments	30	0.03	0.75**	0.04	2.39**	0.01	0.19**	0.29**
Environment + (G × E)	35	0.06	1.28**	0.53**	2.02**	0.21**	0.79**	1.69**
Environmental (linear)	1	0.91**	1.10**	1.00**	0.88**	1.01**	1.00**	1.01**
Genotype × Environmental (linear)	6	0.02	0.22**	0.59**	0.04	0.13**	0.38**	0.70**
Pooled deviation	24	0.03	0.09	0.02	0.006	0.002	0.04	0.03
Pooled error	60	0.22	1.52	0.46	1.09	0.11	0.01	0.03

P*≤ 0.05, P≤ 0.01**

Performance of genotypes under different environments:

The combined analysis of variance between three dates for individual years (Table 2) indicates significant differences between the dates for all studied characters at both years. Significant differences among all the genotype × date interaction effect were found for all characters in both years, reflecting the drastic effect of varying dates between years besides the differential response of genotypes. The mean performance for some financial characters of seven of melon genotypes under 6 conditions is given in Table (2). Information demonstrated that every single considered quality was fundamentally influenced by years, sowing dates, genotypes and their connections. These outcomes showed that wide decent variety existed among all melon genotypes concerning their execution as influenced by different examined factors. With respect to the effect of years, it was observed that a significant increase was found in the second year than in the first one for all studied characters except for total yield. Regarding to the sowing dates, the obtained results indicated that there are different significant among traits except for fruit length, fruit cavity and TSS were the first sowing date (last week of February) gave the highest value for all studied traits. Results in Table (3) demonstrated that there were wide contrasts among the melon genotypes by and large situations for every single contemplated character. For fruit weight which reflected great variations among the genotypes were L-3gave the heaviest fruit weight (1.55kg) meanwhile; the L-6gave the lights fruit weight (0.60kg).concerning fruit height, L-4 gave the highest fruit (15.09cm)while, the lowest fruit length was recorded in L-6(10.17 cm).Fruit diameter was ranged from (13.00 to 9.08 cm)L-4 gave the highest fruit diameter (13.00cm)while, the lowest fruit diameter was recorded in L-6(9.08cm).Fruit cavity was ranged from (5.66to 3.81cm) were L-6 gave the lowest value (3.81 cm) on the contrary L-3 gave the highest value (5.66cm). Regarding flesh thickness was ranged from (2.62 to 4.98cm)L-4gave the highest value (4.98) on the other way L-1 gave the lowest value (2.62cm).with respect Total soluble solids(TSS) was very important for breeders and growers, wide range was observed among genotypes for this trait, were L-1 and L4 gave the highest value (10.5) while L-2 gave the lowest value(8.55).The total yield trait was very important for breeders and growers, L-3gave the greatest value over all evaluated genotypes(13.00 ton/fed.), on the contrary L-6gave the smallest value for this trait(8.33 ton/fed.). These results are in line with those obtained by **Oliveira *et al.* (2019)**

Table (2) Mean performance of the studied melon genotypes combined across three planting dates in the 1st and 2nd years

characters	fruit weight kg		fruit height		fruit diameter		flesh thickness		fruit cavity		TSS		Total yield	
Year(Y) / Geno.	1st year	2nd year	1st year	2nd year	1st year	2nd year	1st year	2nd year	1st year	2nd year	1st year	2nd year	1st year	2nd year
L-1	0.70	0.74	10.78	10.83	9.67	9.75	2.59	2.64	4.91	4.98	10.41	10.60	11.87	11.27
L-2	0.77	0.79	10.27	10.33	10.40	10.50	3.47	3.52	4.51	4.59	8.29	8.81	12.30	12.00
L-3	1.52	1.59	13.95	14.06	12.23	12.30	3.96	4.01	5.61	5.71	9.35	9.53	13.20	12.73
L-4	1.40	1.42	15.03	15.14	12.97	13.07	4.95	5.01	5.49	5.63	10.38	10.63	12.90	12.50
L-5	0.86	0.88	11.33	11.40	10.60	10.63	3.20	3.23	5.68	5.81	8.90	9.06	10.87	10.71
L-6	0.59	0.60	10.06	10.28	9.06	9.11	3.25	3.31	3.75	3.87	8.88	9.02	8.33	8.33
Galia	0.75	0.87	12.31	12.43	10.67	10.74	3.05	3.07	5.22	5.31	9.79	9.85	11.21	11.37
Mean	0.94	0.98	11.96	12.07	10.80	10.87	3.50	3.54	5.02	5.13	9.43	9.64	11.53	11.27
LSD0.05														
Date (D)	0.31	0.31	1.85	1.63	1.54	1.50	0.33	0.39	0.98	0.90	1.98	2.12	1.16	1.54
Geno. (G)	0.38	0.42	1.44	1.47	0.72	0.74	0.20	0.21	0.29	0.34	0.51	0.71	0.84	1.02
G × D	0.69	0.74	2.93	2.84	1.90	1.89	0.45	0.51	1.07	1.05	2.13	2.38	1.46	2.22

Table (3) Mean performance of the studied melon genotypes at 1st, 2nd and3rd planting date over two years as well as combined over both dates and years.

characters	fruit weight (Kg)				fruit height(cm)				fruit diameter(cm)			
Date(D) / Geno.	D1	D2	D3	comb	D1	D2	D3	comb	D1	D2	D3	comb
L-1	0.75	0.72	0.68	0.72	11.15	10.77	10.50	10.8	10.05	9.78	9.3	9.71
L-2	0.87	0.77	0.70	0.78	10.63	10.27	10.00	10.3	10.75	10.45	10.1	10.5
L-3	1.71	1.64	1.32	1.55	15.65	13.32	13.06	14.01	12.75	12.25	11.8	12.3
L-4	1.68	1.40	1.16	1.41	15.61	15.62	14.03	15.09	13.45	13.15	12.4	13.00
L-5	1.01	0.85	0.77	0.88	11.49	11.43	11.16	11.36	11.00	10.60	10.2	10.6
L-6	0.70	0.61	0.50	0.60	10.41	10.10	10.00	10.17	9.72	9.10	8.43	9.08
Galia	0.77	0.72	0.68	0.72	12.75	12.7	11.66	12.37	10.85	10.71	10.56	10.7
Mean	1.07	0.96	0.83	0.95	12.53	12.03	11.48	12.01	11.22	10.86	10.42	10.8
LSD0.05												
Year (Y)				0.05				2.03				1.76
Date (D)				0.35				2.04				0.12
D × Y				0.36				1.38				0.47
Geno. (G)				0.30				2.57				1.90
G × Y				0.39				1.34				0.62
G × D				0.58				2.33				1.16
G × D × Y				0.75				3.04				1.08

Table 3: Cont.

characters	fruit cavity(cm)				flesh thickness(cm)				TSS				Total yield(ton/fed)			
Date(D) / Geno.	D1	D2	D3	comb	D1	D2	D3	comb	D1	D2	D3	comb	D1	D2	D3	comb
L-1	5.16	5.00	4.66	4.94	2.71	2.6	2.53	2.62	11.0	10.6	9.92	10.5	12.35	11.5	10.9	11.6
L-2	4.75	4.56	4.33	4.55	3.58	3.46	3.44	3.5	9.0	8.28	8.37	8.55	12.55	12.25	11.7	12.2
L-3	6.01	5.63	5.33	5.66	4.08	4.00	3.86	3.98	10.2	9.25	8.87	9.44	13.9	13.2	11.8	13.0
L-4	5.93	5.45	5.30	5.56	5.06	4.93	4.94	4.98	10.95	10.65	9.92	10.5	13.6	12.9	11.6	12.7
L-5	6.08	5.73	5.42	5.75	3.31	3.18	3.15	3.22	9.2	8.93	8.8	8.98	11.55	10.9	9.92	10.8
L-6	4.03	3.82	3.56	3.81	3.43	3.28	3.12	3.28	9.61	8.96	8.27	8.95	8.66	8.41	7.92	8.33
Galia	5.56	5.28	4.95	5.27	3.17	3.10	2.90	3.06	10.25	9.85	9.35	9.82	12.21	11.81	9.85	11.3
Mean	5.36	5.07	4.79	5.08	3.62	3.51	3.42	3.52	10.03	9.50	9.07	9.54	12.11	11.56	10.5	11.4
LSD0.05																
Year (Y)				1.10				0.19				0.35				0.68
Date (D)				0.15				0.38				2.35				1.30
D × Y				0.14				0.39				2.39				1.54
Geno.(G)				1.11				0.13				0.34				0.68
G × Y				1.12				0.33				0.55				1.11
G × D				1.14				0.33				2.41				1.93
G × D × Y				1.16				0.43				2.50				2.16

Estimates of stability parameters

Stability parameters which calculated from the total 6 environments using **Eberhart** and **Russell (1966)** model are given in Table (4). It could be mentioned that the performance of a genotype which had non-significant regression coefficients (b=1) may be predicted and said to be stable **(Eberhart and Russell 1966).** The genotypes with the lowest insignificant deviation from regression are most phenotypically stable and vice versa. According to **Eberhart and Russell (1966),** genotypes with "b" esteem less than 1.0 and higher S^2_d than zero are said to be explicitly adjusted to poor or negative situations, while, genotypes having high "b" esteem are explicitly adjusted to ideal or high yielding conditions. They got outcomes in Table (4) showed that estimations of deviation from relapse (S^2_d) were non-huge in most utilized genotypes, demonstrating the solidness of these genotypes with respect to this characteristic. A few genotypes displayed wide adjustment, while others demonstrated explicit adjustment either to positive or negative situations**.** Regarding fruit weight Results showed that L-5 had relapse coefficient (bi) near solidarity and deviation from relapse, not significant than 1 (S^2_d) not altogether from zero. For fruit diameter results showed that L-1, L-3, L-4 had relapse coefficient (bi) near solidarity and deviation from relapse, close to 1 (S^2_d) not altogether from zero. For flesh thickness results showed that L-1, L-3, L-5 had relapse coefficient (bi) near solidarity and deviation from relapse, close to 1 (S^2d) not altogether from zero. For fruit cavity results showed that L-1, L-4, L-5 and L-6 had relapse coefficient (bi) near solidarity and deviation from relapse, not significant than 1 (S^2d) not altogether from zero. For total soluble solids (TSS) results showed that L-1, L-4 had relapse coefficient (bi) close to 1 and (S^2d) not altogether from zero. Concerning total yield results showed that L-1 and L-5 had relapse coefficient (bi) near solidarity and deviation from relapse, close to 1 (S^2d) not altogether from zero. These results are in partial agreements with **Oliveira *et al.* (2019)** and **Daryono *et al.* (2019).**

Table (5) presents coefficient of variability (C.V.) environmental, Genotypic and phenotypic variance (σ^2e, σ^2g and σ^2p) respectively, genotypic and phenotypic coefficient of variance (G.C.V. % and P.C.V. %) data showed that, the highest value of CV observed with fruit weight (44.09 %) on the contrary flesh thickness gave the lowest value (5.74%). The genotypic coefficient of variance was ranged from 72.6% (fruit weight) to 21.6% (TSS). Phenotypic coefficient of variation ranged from 82.2% to 21.7% and the maximum phenotypic coefficient of the variation was observed for fruit weight on the other hand TSS was the lowest. The genotypic and phenotypic estimated variance appeared large, in comparison with the estimated values of error variance, such a result seemed to indicate that the number of replicates used in the evaluation experiment of these genotypes were adequate to give a better estimation for the error variance. These results are in partial agreements with **Oliveira *et al.* (2019)**

Table (4) Estimation of stability parameters for seven traits of seven melon genotypes.

G.	fruit weight			fruit length			fruit diameter			flesh thickness			fruit cavity			TSS			Total yield		
	X	bi	s^2d	X	bi	s^2d	X	bi	s^2d	X	bi	s^2d	X	bi	s^2d	X	bi	s^2d	X	bi	s^2d
L-1	0.72	0.35*	-0.02	10.81	0.63	-0.25	9.72	0.86*	0.04	2.62	0.95**	-0.04	4.94	0.87**	-0.01	10.51	1.05**	0.02	11. 6	1.04**	0.05
L-2	0.78	0.77*	-0.02	10.30	0.61	-0.25	10.44	0.73**	0.04	3.49	0.82**	-0.04	4.55	0.74**	-0.02	8.55	0.84**	0.15	12.2	0.65**	0.02
L-3	1.55	1.75**	-0.01	14.01	2.53**	0.03	12.28	1.06**	0.04	3.98	1.06**	-0.04	5.66	1.20**	-0.02	9.44	1.34**	0.03	12.9	1.40**	0.06
L-4	1.40	2.24**	-0.02	15.09	1.45**	0.01	13.02	1.11**	0.04	4.98	0.78**	-0.04	5.56	1.15**	-0.01	10.51	1.04**	0.03	12.7	1.35**	0.03
L-5	0.88	1.14**	-0.02	11.37	0.32	-0.25	10.62	0.83*	0.04	3.22	0.85**	-0.04	5.74	1.19**	-0.02	8.98	0.43*	0.00	10.8	1.09**	0.03
L-6	0.69	0.25*	-0.01	10.17	0.45	-0.23	9.08	1.41**	0.04	3.28	1.54**	-0.04	3.81	0.85**	-0.02	8.95	1.31**	0.02	8.3	0.48**	0.03
Galia	0.81	1.08**	-0.02	12.37	0.88	-0.02	10.71	0.85*	0.04	3.06	1.02**	-0.04	5.26	1.12**	-0.02	9.82	10.54**	0.03	11.29	1.08**	0.08
LSD 0.05	0.08			0.43			0.06			0.04			0.07			0.29			0.24		
LSD 0.01	0.11			0.63			0.09			0.05			0.10			0.42			0.36		

P*≤ 0.05, P≤ 0.01**

Table (5): Analysis of variance for agronomic traits in melon.

Components of variance	fruit weight	fruit length	fruit diameter	flesh thickness	fruit cavity	TSS	Total yield
C.V %	44.09	12.97	6.59	5.74	4.44	5.37	9.05
σ^2e	0.22	1.52	0.46	1.09	0.11	0.01	0.03
σ^2g	0.77	25.5	13.5	3.57	3.48	4.21	14.51
σ^2p	0.99	27	13.9	4.66	3.58	4.23	14.54
G. C. V. %	72.6	42.2	33.8	52.5	37	21.6	33.4
P. C. V. %	82.2	43.4	34.4	60	37.6	21.7	33.4

CV= coefficient of variability,σ^2e = Error variance,σ^2g = Genotypic variance, σ^2p =Phenotypic variance,
G.C.V =genotypiccoefficient of variance and P.C.V. =phenotypic coefficient of variance

CONCLUSION

On the basis of present results of the experiment, it was concluded that L-1and L-4 genotype could be considered most stable for most of studied traits.

REFERENCE

Abd El-Salam, M.M.M.; I. S . El-Demrdash and A. H. Hussein (2009). Phenotypic stability analysis, heritability and protein patterns of snake cucumber genotypes.6th international plant breeding conference Ismailia, Egypt, May, 3-5.

Aristya, G. R. and B. S. Daryono (2013). Kara kterisasi fenotipdan pewarisan sifat ketahanan terhadap penyakit powdery mildew pada tanaman melon (*Cucumis melo* L.) var. tacapa hasil pemuliaan tanaman", In Prosiding InSINas, pp. 258 – 264.

Burton, G. W. (1952). Quantitative inheritance in grasses. Proceeding 6th International Grassland Congress, 1: 227-283.

Daryono, B. S. , R. Hadi and Y. Sidiq (2015). Maryanto. Characters Stability of Melodi Gama-3 Melon (*Cucumis melo* L.) Cultivar in Rainy Season Based on Multilocation Test. *IPTEK, J. Proceeding Series, 1: (eISSN: 2354-6026)* .

Daryono BS and SD.Maryanto (2017). Keane karagamandan Potensi Sumber Daya Genetik Melon. GadjahMada University Press, Yogyakarta. pp. 1-2; 76-81. [Indonesia].

Daryono, B. S.; A. S. Subiastuti; A. Fatmadanni and D. Sartika (2019). Phenotypic and genetic stability of new Indonesian melon cultivar (*Cucumis melo* L. 'Melonia') based on ISSR markers. *Biodiversitas, J*. 20 (4): 1069-1075.

Eberhart, S. A. and W. A. Russell (1966). Stability parameters for comparing varieties. Crop Sci. 6: 36-40.

Gomez, A.K. and A.A. Gomez (1984). Statistical Procedures for Agricultural Research. 2nd ed. John Wiley & Sons Pub., New York.

Little, T.M. and J.F. Hills (1975). Statistical methods in agricultural research. UCD Book Slore, pp. 242.

Nunes, G.H.S.; Santos Júnior, J.J.; Andrade, F.V.; Bezerra Neto, F.; J.B. Menezes and E.W.L. Pereira (2005). Desempenho de híbridos do grupo*inodorus*emMossoró. Horticultura Brasileira, Brasília, DF, 23(1):90-94.

Oliveira, L. ;A. de Araújo ;E. de Almeida; C.A. de Oliveira; A.F.Martins; J.M. da Costa and G. H.de Sousa Nunes(2019) Stability, adaptability and shelf life of Cantaloupe melon hybrids. Rev. Bras. Frutic., 41 (5):1-11.

Yan, W. and E. Cereal (2011). GGE biplot vs. AMMI graphs for genotype-by-environment data analysis. J. India Soci. Agric. Stati., New Dehli, 65(2):181- 193.

تحليل الثبات للسلالات الجديدة في الشمام

عمرو أحمد السيد

قسم بحوث تربية الخضر والنباتات الطبية والعطرية – معهد بحوث البساتين – مركز البحوث الزراعية. الجيزة. مصر.

تم تقييم ستة سلالات جديدة واعدة من الشمام (*Cucumis melo* L.) في ظل ستة ظروف بيئية (ثلاثة مواعيد زراعة لعامي 2019 و 2020). تم استخدام تصميم القطاعات الكاملة العشوائية (RCBD) بثلاث مكررات لكل تاريخ زراعة في مزرعة بحوث الخضر في قها ، محافظة القليوبية ، معهد بحوث البساتين (HRI) ، مركز البحوث الزراعية (ARC) ، مصر. تم تسجيل البيانات لبعض الصفات مثل: متوسط وزن الثمرة ، طول الثمرة ، قطر الثمرة ، سمك اللحم ، حجم الفجوة ، المواد الصلبة الذائبة الكلية (TSS). تم تحديد 5 ثمار صفراء ناضجة باستخدام الرفراكتوميتر والمحصول الكلي تم حسابه بوزن جميع الثمار المحصودة عند النضج. وأشارت النتائج إلى أن التفاعل الخطى لتأثير البيئة كان عالى المعنوية لكل الصفات المدروسة مؤكدا وجود فروق بين البيئات المختلفة مما يؤثر على هذة الصفات. وكان التفاعل بين التراكيب الوراثية والبيئات معنويا لجميع الصفات المدروسة مما يدل على أن أداء التركيب الوراثى يختلف اختلافا كبيرا عبر البيئات المختلفة. وعلاوة على ذلك فإن التفاعل بين التراكيب الوراثية والبيئات (دالة خطية) كان معنويا لجميع الصفات المدروسة. أظهرت النتائج أنه بالنسبة لوزن الثمرة L–5 كان اكثر ثباتا. أظهرت نتائج سمك اللحم أن L–1 و L–3 و L–5 هم اكثر ثباتا. بالنسبة لمجموع المواد الصلبة الذائبة (TSS) أظهرت النتائج ان L–1، L–4 أنهما كانا اكثر ثباتا. فيما يتعلق بالمحصول الكلي أظهرت أن L–1 و L–5 كانا اكثر ثباتا.