6- Summary

This study was carried out to compare three methods of stability for ten cotton genotypes during 1997 and 1998 seasons . The compared methods were Tai , AMMI and Eberhart and Russell . Ten genotypes were used to study the stability parameters . These genotypes were Giza45 , Giza80 , Giza83 , Giza77 , Giza85 , Giza86 , Giza87 , Giza70 , Giza89 , and a breeding line resulted from a cross between (Bahtem105 x Giza67) and (Giza72 x Delecero) . The ten genotypes were planted in seven different locations in El-Sharkia , El-Monofiah , El-Dakahlia , El-Behayrah , El-Gharbia , Damietta and Kafr El-Shiekh Govornorates during 1997 season , while in 1998 the genotypes were planted in six of the above locations except that of El - Gharbia .

The statistical analysis was done for the results of 1997 season , 1998 season separately and the combined results of both 1997 and 1998 seasons together . χ^2 was also calculated for the . two seasons to clarify which method is more accurate than the other two methods .

The measured traits were :-

1- Seed cotton yield (Kantar/fad) .
2- Lint yield (Kantar/fad) .
3- Boll weight .
4- The lint percentage .
5- Earliness .
6- Seed index .
7- Lint index .
8- Micronair reading .
9- Pressly index .
10- 2.5% Span Length .
11- 50% Span Length .
12- Uniformity ratio .

The results of this study could be summarized as follows :-

1- Results of the analysis of variance for all traits over each of 1997 season, 1998 season and the combined of both seasons showed different significant levels for the mean squares for treatments (T) , environment (En) , genotypes (G) G x En interaction and first , second , third , fourth , fifth sixth , seventh and eighth interaction principal component axis (IPCA1 through IPCA8) .

2- Results of the seed cotton yield showed that all genotypes were unstable when Eberhart and Russell method was applied over 1997, 1998 and the combined of the two seasons . While Tai method showed unstable genotypes during 1997 and the combined of both seasons with only three stable genotypes during 1998 season. According to the AMMI method Giza 89 and Giza 70 genotypes showed high level of stability over 1997, 1998 and the combined of the two seasons . χ^2-test illustrated that Eberhart and Russell method was the most accurate while the AMMI method was the least one .

3- Eberhart and Russell method showed , for lint yield trait , that all genotypes were unstable except Giza 70 during 1997 and the combined of the two seasons. The Tai method indicated that all genotypes were unstable for the lint yield trait except five genotypes during 1998 season. The AMMI method showed different stable genotypes over separate or combined seasons. Over all results revealed that three genotypes, Giza 85, Giza 70, and Giza 89 showed high level of stability over either 1997, 1998 or the combined average . χ^2 test showed that Eberhart and Russell method was the most accurate one followed by Tai and then the AMMI method .

4- Eberhart and Russell method indicated that- except Giza 83(1997 season) and Giza 45 (combined) all genotypes were unstable for the Boll weight trait . The Tai method showed different degrees of stability for the Boll weight trait over 1997 : 1998 or the combined average . The four genotypes Giza 45 , Giza 86 , Giza 70 and Giza 89 showed an average level of stability according to the Tai method in all of 1997 , 1998 and the combined. The AMMI method showed different levels of stability for the boll weight over 1997 , 1998 and the combined average . The χ^2 test showed that Tai method was more accurate than the other two methods while the AMMI method was the least one as they are applied to measure the boll weight stability .

5- Comparing the three methods to measure the stability of different genotypes for the lint percentage trait, it could be seen that Eberhart and Russell showed unstable genotypes over the individual or combined seasons except with Giza 85

and Giza 70 (1997 season) and Giza 77 (1998 season) . Tai method revealed that five genotypes in 1997 season , eight genotypes in 1998 season and seven genotypes in the combined analysis of the two seasons showed an average level of stability . The AMMI method showed variable trends and values of stability with no stable attitude with different genotypes . χ^2 - values showed that Tai method is more accurate followed by Eberhart and Russell and then AMMI for measuring the stability of the lint % .

6- Eberhart and Russell method showed that - except Giza 80 genotype in 1998 all genotypes were unstable for Earliness % during 1997 , 1998 and the combined . Tai method illustrated that only four different genotypes every season exhibited an average level of stability . The AMMI method indicated that some genotypes had higher Earliness % stability than the others but still low in general . Level of stability in 1997 was higher than either that of 1998 or that of the combined . χ^2 - test indicated that Tai method could be more accurate followed by Eberhart and Russell then by the AMMI method when they were compared in measuring the stability of different genotypes for Earliness % trait .

7- Comparing the stability of different genotypes for the seed Index trait , Eberhart and Russell method showed unstability of all genotypes during 1997 , 1998 and the combined average of two seasons . Tai method showed that genotypes stability varied between the two seasons , but only two genotypes (Giza83 and Giza 87) showed an average level of stability during the two seasons separately or combined over both seasons . The same varied trend was also observed with the AMMI method during the two seasons separately or combined over both seasons . Only three genotypes (Giza 83 , Giza 87 and Giza 70) showed remarkable level of stability through the three methods . χ^2- test indicated that Eberhart and Russell method is the most accurate method for measuring the stability of genotypes for seed index trait followed by Tai and then by the AMMI method .

8- When the three methods were compared for measuring the stability of genotypes for lint index trait , it was found that except Giza 70 in 1997 and Giza87 in 1998 - Eberhart and Russell showed unstability for all genotypes during 1997 ,

1998 and the combined over two seasons . Tai method followed another different trends showing an average level of stability for some genotypes and low stability for the others during the same seasons . The AMMI method showed that only Giza 86 , Giza 87 and Giza 70 genotypes had higher . level of lint index stability than the others over 1997 , 1998 and the combined analysis of the two seasons . χ^2 - test illustrated that the AMMI method was the most accurate method followed by Tai then by Eberhart and Russell method when compared for lint index trait stability over 1997 , 1998 and the combined analysis .

9- Eberhart and Russell method showed that all genotypes except Giza 87 in 1997 were unstable for the micronair reading trait . The majority of the genotypes were unstable for the micronair reading during 1997 season and the combined results of the two seasons, while half of the genotypes showed an average level of stability of micronair reading trait during 1998 season according to Tai method . The stablity of the genotypes for micronair reading trait was observed with 5-6 genotypes of the total number over 1997 , 1998 and the combined average when the AMMI method was applied . χ^2 - test indicated that Eberhart and Russell method was the most accurate one amongst the three methods for measuring the stability of the micronair reading followed by Tai then by the AMMI .

10-Eberhart and Russell method showed that all genotypes - except Giza 77 (in 1997 season) and Giza 86 (in 1998 season) were unstable when it was applied to measure the stability of genotypes for the Pressly index . According to Tai method, only 4 - 5 genotypes showed an average level of stability for Pressly index trait varying amongst seasons , the only common genotype was Giza 87 . The AMMI method illustrated that 5-6 genotypes showed relatively higher . stability- especially over 1997 season-which gradually decreased over 1998 and the combined . The AMMI method indicated that only Giza 77 and Giza 86 showed relatively higher stability over 1997, 1998 and the combined of the two seasons . χ^2 - test illustrated that Tai method was the most accurate one to measure the stability of different genotypes for the Pressly index trait followed by Eberhart and Russell then by the AMMI method .

11-When measuring the stability of genotypes for the 2.5 % Span Length , results of Eberhart and Russell method showed that all genotypes - except Giza 86 (in 1998 season) were unstable . Tai method indicated that there was no steady trend of stability with different genotypes in different seasons . The AMMI method showed that 3-5 inconsistent genotypes revealed relatively high stability while only two genotypes (Giza 86 and Giza 89) were common in 1997 , 1998 and the results of the combined . χ^2 - Test illustrated that Eberhart and Russell was the most accurate one amongst the three method followed by the AMMI method then by Tai method .

12-Eberhart and Russell method showed that all genotypes except Giza 86 in 1998 season - were unstable for the 50 % Span Length trait. Tai method indicated that only 1-3 genotypes - out of ten - showed an average level of stability. The AMMI method gave an inconsistent trend of stability of genotypes for the 50% Span Length which varied between each of the two seasons as well as between individual seasons and combined average of the two seasons . χ^2 - test indicated that Tai method is more accurate than the other two methods .

13-Eberhart and Russell method indicated that- except Giza 86 genotype - all genotypes showed unstability for the uniformity ratio over 1997 , 1998 and the combined . Tai method illustrated that three genotypes showed an average level of stability over 1997 season being six genotypes over 1998 season and only three genotypes in the combined analysis showed an average level of stability . The AMMI method illustrated that six genotypes showed relatively higher stability in 1997 and eight genotypes showed higher stability in 1998 , while six genotypes showed higher stability in the combined . χ^2 - test illustrated that both Eberhart and Russell and AMMI methods were more accurate for measuring the stability of uniformity ratio than Tai method .

14-It was concluded that : -

a- The results of Eberhart and Russell were different from those of the other method .

b- Both AMMI and Tai methods were effective in defending different levels of stability .

c- The AMMI method might be better in selecting genotypes with high performance and stability through the biplots of mean and scores of each significant IPCA component .

d- χ^2 - values varied from one method to another and from one trait to another