STABILITY EVALUATION OF SUNFLOWER YIELD

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ABSTRACT

To develop a Variety With a low effect of interreaction on genotgpe and enviroment , two breeding strategies should be considered: (a) To develop a regional variety adaptable to the ecological enviroment in the location. (b) To develop or introduce a hightly stable variety adaptable to the different enviroments. The method to estimate genetic stability of variety (Taic. c, 1971) is used in the study, where the effect of interreaction on genotype and enviroment of a variety is resolved into two parts : ① Direct respondence to the effect of enviroment , which is estimated with statistical Value; ② Variance of direct respondence, which is estimated with statistical Value. The theoretical results of statistics are as following: For an absolute steady variety, $\hat{\alpha} = -1$, $\hat{\lambda} = 1$; for a common steady variety, $\hat{\alpha} = 0$, $\hat{\lambda} = 1$. The first lot of hybrids in china is analyzed for yield stability with the two above-mentioned parameters in this study.

Key words: sunflower yield stability evaluation

INTRODUCTION

The interreaction of genotype and enviroment has been found in plant breeding work. To develop a variety with a low effeet of interreaction on genotype and en-viroment, tow breeding strategies should be considered;(a) To develop a regional variety adaptable to the ecological enviroment in the location.(b)To develop or introduce a high adaptable to different enviromental situations. To meet the second strategy, It is necessary to do stability evaluation for the devoloped or introduced varieties. The method to estimate genetic stability of a variety (Taic.c,1971) is used in the study, where the

effect of in terreaction on genotgpe and enviroment of a variety is resolved in to two parts: (1) The direct respondence to the effect of enviroment, which is estimated with statistical value. (2) The Variance of direct respondence,which is estimated with statistical Value. The theoretical result of statistics are as following; For an absolute steady variety $\hat{\alpha}$ =-1, $\hat{\lambda}$=1 ; For a common steady variety $\hat{\alpha}$ =0, $\hat{\lambda}$=1. We use above-metioned two parameters to analysis of yield stability for the first lot of suflower hybrids in china in the study.

MATERIALS AND METHOD

The experimental materials were the first lot of sunflower hybrids in china: LiaoKuiZa 1 , ShenKuiZa 1, BaiKuiZa 1, 485A×77- 13, Peridovic. Based on the date of national sunflower regional trials in 1980. The experiment use randomized-blocks design with 3 replications, the area of a plot is 35m², the density is 35×70cm,test the sunflower yield of every plot. first We take randomized-blocks analysis of mean squares for yield, According to the result of statistical analysis, if F value of interreaction effect of varity x enviroment reached significant level , We continue calculatea $\hat{\alpha}$ and $\hat{\lambda}$, to estimate genetic stabilityof sunflower hybrids.

RESULTS AND DISCUSSLON

The results of randomized blocks analysis of mean square for sunflower yield of national sunflower hybrids regional trial shown in table 1.

Table 1.The result of statistical analysis of national sunflower regional trials.

Source	D.F	S. S	M S	F	
Enviroments	6	2914.80	485.80	67.00**	MSL
Replication	2	39.02	19.51	2.96	MSB
Varieties	4	530.66	132.66	18.29**	MSV
Variety × Enviromeat	24	390.61	16.28	2.24**	MSVL
Error	56	406.31	7.25		MSE
Sum	92	4280.60			

The result of table 1 shown that F Value of interreaction effect of variety × Enviroment achieved extremely significant level , so We continus caculate $\hat{\alpha}$ and $\hat{\lambda}$ by above-mentioned formula. we line up Sunflower yield of the regional trials in table 2

Table 2 .The sunflower yield of the regional trials

Locations	Liao kui za 1	485A× 77-13	Shen kui za 1	Bai kui za-1	peridovic	$X._j$
Nei Mongol	30.99	21.85	27.05	24.89	21.70	25.29
Shan dong	19.55	13.16	17.42	19.02	16.89	17.21
Liao ning	17.69	11.25	13.66	12.80	7.61	12.60
Shen yang	13.09	10.95	11.84	16.50	12.59	12.99
Bai cheng	24.29	22.60	26.46	33.07	27.24	26.73
Chang ling	24.25	19.25	21.06	29.23	20.83	22.92
Hei long jiang	22.82	17.93	20.54	24.23	19.92	21.09
Xi·	21.81	16.71	19.72	22.82	18. 11	X.=19.83

We used above- mentioned formula to caculate the five sunflower varieties genetical stability parameters, the results shown in table 3. Table 3. The genetical stability parameters of sunflower hybrids

Varieties	$\hat{\alpha}$	$\hat{\lambda}$	GCV	Evaluation
Liaokui za 1	−0.001	4.07	26.18	common steady
485A× 77-13	−0.15	0.20	29.44	----
Shen kuiza 1	0.0005	0.80	29.66	common steady
Baikuiza 1	0.19	3.16	31.38	-----
Perodovic	0.08	1.89	35.61	-----

According to the result of table 3.We could get following conclusion:

1.The direct respondence to the effect of enviroment of Liaokuiza 1. Shenkuiza 1, the values nearly equal to zero, the variance of direct respondencd, the values mort than 1,It indicate both of them have the common stability, considing to their GCV ,We found liaokuiza 1 have much more stability.

2.According to sunflower yield result of the regional trials,Baikuiza 1 occupy first place, but it's stability is not as good as LiaoKuiza 1 and Shen Kuiza 1.

3.The first lot of sunflower hybrids,BaiKuiza 1, Liao Kuiza1, Shen Kuiza 1, all of them are not absolute steady variety,each one has its extension area.