

목화品種의 收量과 收量構成 形質에 대한 環境適應 分析

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Analysis of Stability for Yield and Yield Components in Cotton Varieties

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實驗目的

1987년부터 4年間に 걸쳐 무안과 진주地域에서 수행했던 試驗成績을 이용하여 供試系統들의 環境適應性을 收量 및 收量構成 要素別로 檢討하여 廣 適應性 목화品種 育成에 관한 基礎資料를 얻고자 함.

材料 및 方法

供試品種 : 木浦4號, 木浦5號, 木浦6號, 木浦7號, Coker 100^w, Paymaster.
栽培地域 : 무안, 진주
播種期 : 5月10日
栽植密度 : 70 x 20cm
施肥量(kg/10a) : N - P₂O₅ - K₂O - Compost = 4 - 4 - 5 - 1,000
統計處理 : Eberhart Model

結果 및 考察

1. Mokpo 7號는 收量에 있어서 安定성이 높은 品種이었다.
2. 收量 構成 要素別 分析에서도 Mokpo 7號는 環境에 대한 높은 安定성을 보여 이 品種의 環境 安定性 品種 育成에 利用價値가 높은 것으로 期待된다.
3. 品種의 收量에 대한 環境 安定性 反應에는 結果指數와 삭수의 影響이 큰 것으로 나타났다.

Table 1. Sowing time, planting density and amount of fertilization at different experimental sites in cotton cultivars.

Experi. sites	Sowing time	Planting density	Amount of fertilization (kg/10a)			
			N	P ₂ O ₅	K ₂ O	Compost
Meeran, Jinju	May 10	70 x 20cm	4	4	5	1,000

Table 2. Analysis of variance for the significant test of genotype-environmental interaction with the i-th variety.

S. V.	d. f.	S. S.	M. S.	F
Total	nr - 1	$\sum_i \sum_j Y_{ijk}^2$		CT
Environment	n - 1	$\sum_i Y_{ij}^2 / r$		CT
Linear	1	$\sum_j \sum_k (Y_{ijk} - Y_{i..})^2$		
Residual	nr - 2	S.S.Total - S.S.Linear		
Loth of fit	n - 2	S.S.Envir. - S.S.Linear	MSL	MSL/MSK
Para error	n(r - 1)	S.S.Total - S.S.Envir.		MSE

$CT = Y_{i..}^2 / nr$, $Y_{ijk} = \mu_i + \beta_j I_j$

Table 3. Picked cotton yield

Cultivar	Mean (kg/10a)	Regr. coef.	MSL	R ²
Mokpo 4	114.5	0.95	390.12**	0.987
Mokpo 5	122.2	0.92	625.79**	0.977
Mokpo 6	115.1	0.93**	120.28**	0.986
Mokpo 7	116.9	0.92	461.85	0.983
Coker 100*	108.5	1.13**	370.77**	0.991
Pymaster	116.6	1.12**	540.85**	0.987
Mean	115.6			

*, ** Significant at the 0.05 and 0.01 levels, respectively.

Table 4. Stalk-cut cotton yield

Cultivar	Mean (kg/10a)	Regr. coef.	MSL	R ²
Mokpo 4	66.8	0.84**	147.89**	0.967
Mokpo 5	53.0	0.93**	280.39**	0.956
Mokpo 6	54.7	1.02	130.67**	0.980
Mokpo 7	55.7	0.93	76.81	0.985
Coker 100*	55.5	1.01	149.76**	0.976
Pymaster	63.8	1.15**	28.05**	0.985
Mean	55.1			

*, ** Significant at the 0.05 and 0.01 levels, respectively.

Table 5. Lint yield

Cultivar	Mean (kg/10a)	Regr. coef.	MSL	R ²
Mokpo 4	56.9	0.95	77.77**	0.937
Mokpo 5	64.3	0.91*	59.01**	0.947
Mokpo 6	60.2	0.83**	43.95**	0.9951
Mokpo 7	61.0	0.87	112.47	0.897
Coker 100*	61.5	1.33**	89.75**	0.950
Pymaster	67.5	1.11	98.18**	0.938
Mean	61.8			

*, ** Significant at the 0.05 and 0.01 levels, respectively.

Table 6. Stem length

Cultivar	Mean (kg/10a)	Regr. coef.	MSL	R ²
Mokpo 4	80.6	0.97	42.35**	0.978
Mokpo 5	79.6	1.02	45.05**	0.981
Mokpo 6	79.5	0.94*	11.14	0.938
Mokpo 7	83.5	1.05	135.58**	0.951
Coker 100*	85.5	0.93	14.85*	0.930
Pymaster	81.1	1.02	55.03**	0.983
Mean	81.7			

*, ** Significant at the 0.05 and 0.01 levels, respectively.

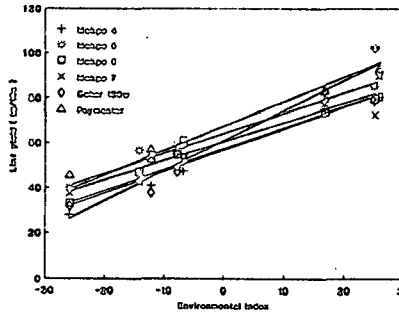
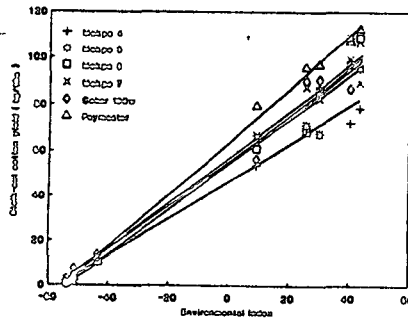
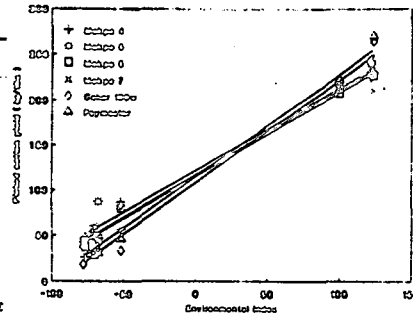


Fig. 1. Regression of mean picked cotton yields of cotton cultivar on environmental indices grown at 2 locations in 4 years.

Fig. 2. Regression of mean stalk-cut cotton yields of cotton cultivar on environmental indices grown at 2 locations in 4 years.

Fig. 3. Regression of mean lint yields of cotton cultivar on environmental indices grown at 2 locations in 4 years.

Table 7. No. of bearing branch

Cultivar	Mean (kg/10a)	Regr. coef.	MSL	R ²
Mokpo 4	8.7	1.05	0.46	0.982
Mokpo 5	9.3	0.95	1.63**	0.897
Mokpo 6	8.9	0.97	0.47	0.944
Mokpo 7	9.3	1.01	0.97	0.903
Coker 100*	8.5	1.14	1.44	0.889
Pymaster	9.0	0.85	1.29	0.847
Mean	8.9			

*, ** Significant at the 0.05 and 0.01 levels, respectively.

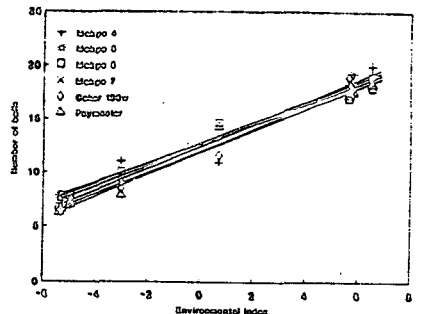
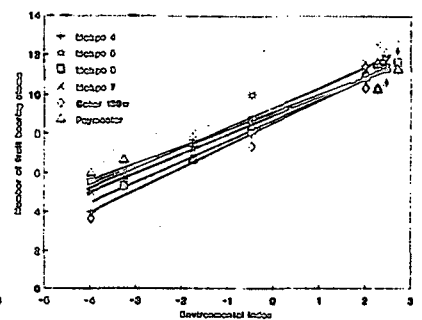
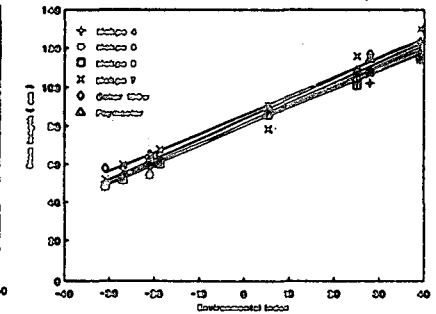


Fig. 4. Regression of mean stem length of cotton cultivar on environmental indices grown at 2 locations in 4 years.

Fig. 5. Regression of mean number of fruit bearing stems of cotton cultivar on environmental indices grown at 2 locations in 4 years.

Fig. 6. Regression of mean number of bolls of cotton cultivar on environmental indices grown at 2 locations in 4 years.

Table 8. No. of capsules

Cultivar	Mean (kg/10a)	Regr. coef.	MSL	R ²
Mokpo 4	12.3	0.98	4.77**	0.930
Mokpo 5	12.5	1.04	1.01	0.930
Mokpo 6	12.5	0.92	2.09	0.930
Mokpo 7	12.7	0.97	0.50	0.935
Coker 100*	11.9	1.05	1.27*	0.930
Pymaster	12.1	1.01	2.01*	0.953
Mean	12.3			

*, ** Significant at the 0.05 and 0.01 levels, respectively.