

大豆의 品種에 關한 研究

第3報 生態型과 諸 特性間 그리고 收量과 諸 特性間의 關係

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Studies on the soybean varieties in Korea.

III. Relationships between the ecotypes and various characteristics.

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SUMMARY

Experiments were carried out to make clear the relationships between ecotypes and some ecological characteristics, between ecotypes and some morphological characteristics, between grain weight per plant and some ecological characteristics, and between grain weight per plant and some morphological characteristics of soybean varieties in Korea.

Soybean varieties used as the material were 100, Korean local, Japanese, American and Canadian varieties. The 43 Korean local varieties and 9 Japanese varieties used were the determinate growing habit type-Oriental determinate varieties, but American and Canadian varieties were classified into the determinate and the indeterminate growing habit types.

These varieties were grown in the Experimental Farm, College of Agriculture, Seoul National University, Suwon, Korea. Seed sowing was conducted at 8 times, at 15 day-intervals, from April 15 to July 29, 1962.

Table 1. Relations between ecotypes and some ecological characteristics of Oriental, American and Canadian soybean varieties in Korea.

Ecotype	Oriental varieties		American and Canadian varieties				Total varieties
	determinate		determinate		indeterminate		
	r	\hat{y}	r	\hat{y}	r	\hat{y}	
Days to flowering	0.5624**	47.54 + 1.43X	0.9201**	39.69 + 2.42X	0.7710**	39.37 + 2.94X	0.9121**
Flowering to maturity	0.1085		0.7738**	58.09 + 1.93X	0.2742		0.4449**
Durations of flowering	0.0586		-0.0199		-0.1507		-0.2159*
Days to maturity	0.3087*	67.92 + 0.49X	0.8730**	97.42 + 4.71X	0.7734**	104.81 + 3.36X	0.7789**
Shortened ratio of flowering dates	0.7746**	10.69 = 0.62X	0.9333**	10.39 + 0.82X	0.8687**	9.39 + 0.87X	0.8593**
Shortened ratio of seed forming periods	-0.1539		0.5802**	1.19 + 0.58X	0.0000		0.3138**
Relative flowering periods	-0.2399		-0.7314**	0.64 + 0.03X	-0.7277**	0.64 + 0.03X	-0.7042**
Shortened ratio of maturity dates	0.2484		0.8838**	13.04 + 1.22X	0.6798**	14.89 + 0.82X	0.7165**
Relative growing periods	-0.3384*	2.28 + 0.01X	-0.6147**	2.54 + 0.05X	-0.6899**	2.61 + 0.08X	-0.6060**

*.....Significant at the 5% level

**.....Significant at the 1% level

Simple correlation coefficients and regression coefficients were calculated between ecotypes and some ecological characteristics, between ecotypes and some morphological characteristics, between grain weight per plant and some ecological characteristics, and between grain weight per plant and some morphological characteristics of the varieties.

The results obtained are summarized as follows:

1. Correlations between ecotypes and ecological characteristics are shown in Table 1.

Among some ecological characteristics, it was observed that there were close relationships between ecotypes and days to flowering, the shortened ratio of flowering dates, days to maturity, and the shortened ratio of maturity dates, and there were some negative correlations between ecotypes and the relative flowering periods, and between ecotypes and the relative growing periods. There was no clear correlation between ecotypes and durations of flowering, ecotypes and days from flowering to maturity, and ecotypes and the shortened ratio of seed forming periods of the varieties in this study.

2. Correlations between ecotypes and some morphological characteristics are shown in Table 2.

Table 2. Relations between ecotypes and some morphological characteristics of Oriental, American and Canadian soybean varieties in Korea.

Ecotype	Oriental varieties		American and Canadian varieties				Total varieties	
	determinate		determinate		indeterminate			
	r	\hat{y}	r	\hat{y}	r	\hat{y}	r	\hat{y}
Stem length	-0.0221		0.5517**	39.94+2.76X	0.5851**	58.12+6.38X	0.1223	
Stem diameter	0.2157		0.7762**	0.68+0.06X	0.4066		0.1359	
Length of internode	-0.0010		-0.8240*	2.10+0.01X	0.4158*	1.59+0.05X	0.1076	
Branch length	0.0237		0.6171**	27.50+2.15X	0.4364*	29.39+8.81X	0.1814	
Branch no./plant	0.2637		0.3899		0.4687*	4.60+0.11X	0.0442	
Branch angularity	0.1595		0.1287		0.0006		0.0638	
Plant weight	0.2333		0.8889**	16.24+8.39X	0.4903*	43.31+5.89X	0.5225**	49.15+3.99X
Pod no./plant	0.4226**	62.92+3.85X	0.6445**	36.76+8.57X	0.3908		0.4857**	49.14+6.22X
Grain no./plant	0.4339**	57.67+14.79X	0.7137**	72.77+14.25X	0.3494		0.5224**	41.18+17.49X
Grain weight/plant	0.3169*	21.15+2.44X	0.7867**	8.44+2.61X	0.4322*	16.45+1.58X	0.6240**	12.72+2.97X
Grain weight/liter	0.2101		-0.0614		-0.0428		-0.0990	
100 grain weight	-0.2286		-0.0946		0.0973		0.1887	

*.....Significant at the 5% level.

**.....Significant at the 1% level.

From this table, it was also observed that there were some close relationships between ecotypes and plant weight, pod number per plant and grain weight per plant, but there was no clear relationship between ecotypes and stem length, stem diameter, length of internode, branch length, branch number, branch angularity, grain weight per liter, and 100 grain weight, respectively.

3. Correlations between grain weight per plant and some ecological characteristics of the varieties used are shown in Table 3.

From the results obtained, it was observed that there were some close relationships between seed yield and days to flowering, days from flowering to maturity, and days to maturity, respectively. It was also observed

that there was no correlation between seed yield and flowering durations of the varieties.

Table 3. Simple correlation coefficients between grain weight per plant and some ecological characteristics of Oriental, American and Canadian soybean varieties in Korea.

Characteristics	Grain weight per plant			Total varieties
	Oriental varieties	American and Canadian varieties		
	determinate	determinate	indeterminate	
Days to flowering	0.5348**	0.7844**	0.0975	0.6229**
Durations of flowering	0.1771	-0.0773	0.0208	-0.1638
Flowering to maturity	0.3374*	0.5790**	0.6093**	0.5433**
Days to maturity	0.4361**	0.7810**	0.5350**	0.6722**

*.....Significant at the 5% level.

**.....Significant at the 1% level.

4. Correlations between grain weight per plant and some morphological characteristics are shown in Table 4.

Table 4. Simple correlation coefficients between grain weight per plant and some morphological characteristics of Oriental, American and Canadian soybean varieties in Korea.

Characteristics	Grain weight per plant			Total varieties
	Oriental varieties	American & Canadian varieties		
	determinate	determinate	indeterminate	
Stem length	0.0735	0.3664	0.0709	0.0423
Stem diameter	0.4396**	0.6785**	0.6297**	0.4603**
Length of internode	0.1440	0.1496	0.3172	0.1574
Branch length	0.1183	0.5160**	-0.0304	0.1088
Branch no./plant	0.5129**	0.3324	-0.0391	0.0560
Branch angularity	0.2637	-0.1124	-0.1526	0.0255
Plant weight	0.5219**	0.7491**	0.4764**	0.5779**
Pod no./plant	0.6185**	0.7089**	0.1508	0.4648**
Grain no./plant	0.7111**	0.8034**	0.1496	0.6098**
Grain weight/liter	-0.0133	-0.0813	-0.4438*	-0.3039**
100 grain weight	0.3393*	0.0071	0.6535**	0.6126**

*.....Significant at the 5% level.

**.....Significant at the 1% level.

From this table, it can be observed that there were some close relationships between grain weight per plant and stem diameter, branch number per plant, plant weight, pod number per plant, grain number per plant, and grain weight, respectively, among many morphological characteristics of the soybean varieties.

So it can be recognized that soybean yield is affected by the growing periods and some morphological characteristics, such as stem diameter, branch number per plant, plant weight, pod number per plant, grain number per plant, and grain weight etc.