

A47 Lipoxygenase 缺如 콩 품종의 발아특성

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Seed Characteristics of Lipoxygenase-Lacking Soybean Genotypes
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Objectives

This study was conducted to understand the relationship of seed germination with seed lipoxygenase in soybean. Three soybean genotypes, Jinpumkong lacking lipoxygenase-2, 3, Jinpumkong 2 lacking lipoxygenase-1, 2, 3, and Taekwangkong containing lipoxygenase-1, 2, 3 isozymes in seed were evaluated for major traits of seed and germination. Seed germination characteristics after accelerated aging were also studied in relation to seed lipoxygenase activity.

Materials and Methods

- o Cultivar used : Jinpumkong, Jinpumkong 2 and Taekwangkong
- o Thiobarbituric acid (TBA) : Davies et al (1987)
- o Accelerated aging test : AOSA method(1983)
- o Germination rate test : three replications of 50 seeds each are placed on petri dish with filter paper (Whatman No.2)

Results and Discussion

Greater seed coat cracking was shown in Jinpumkong and Jinpumkong 2 than Taekwangkong. Thiobarbituric acid (TBA) value of Jinpumkong and Jinpumkong 2 was lower than that of Taekwangkong. Germination percentages of Jinpumkong and Jinpumkong 2 were lower than that of Taekwangkong. Accelerated aging resulted in lower germination percentages of Jinpumkong and Jinpumkong 2 than that of Taekwangkong. Generally, germination percentages of Jinpumkong and Jinpumkong 2 was lower than that of Taekwangkong as accelerated aging become longer. Germination rate did not show any correlation with lipoxygenase activity.

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Table 1. Germination percentage of Taekwangkong, Jinpumpkong, and Jinpumpkong 2 as affected by planting time and accelerated aging.

Year	Cultivar	Planting date			Mean
		May 15	June 8	June 26	
			----- % -----		
1996	Taekwangkong	68.3	92.3	95.9	85.5 ^a *
	Jinpumpkong	39.9	79.6	77.6	65.7 ^b
	Jinpumpkong 2	32.0	71.2	75.1	59.4 ^b
	Mean	46.7 ^b *	81.0 ^a	82.9 ^a	
1997	Taekwangkong	79.3	80.0	82.7	80.7 ^a
	Jinpumpkong	48.0	56.7	74.7	59.8 ^b
	Jinpumpkong 2	28.7	54.0	62.7	48.5 ^c
	Mean	52.0 ^b	63.6 ^a	73.4 ^a	
1998	Taekwangkong	40.0	47.3	60.0	49.1 ^a
	Jinpumpkong	18.0	34.0	39.3	30.4 ^b
	Jinpumpkong 2	18.7	28.7	42.7	30.0 ^b
	Mean	25.6 ^c	36.7 ^b	47.3 ^a	

* Means within the same row or within the same column followed by the same letter are not significantly different at $P = 0.05$ based on LSD.

Table 2. Correlation coefficients between seed quality parameters and seed deterioration measurements for all cultivars in all planting dates

Seed [†] quality	Free fatty acids [‡]					Crude protein	Crude lipid	Lipoxygenase [§]	
	16:0	18:0	18:1	18:2	18:3			I	II
SG	-0.27	0.27	0.11	0.04	-0.14	0.02	0.14	0.27	0.26
AA	-0.61 ^{***}	0.54 ^{**}	0.40 [*]	-0.22	-0.32	0.04	0.07	0.17	0.21
EC	0.17	-0.52 ^{**}	0.11	-0.25	-0.06	-0.17	-0.13	-0.10	-0.05

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

† Seed quality parameters [standard germination (SG), germination following accelerated aging (AA), and electric conductivity (EC)]

‡ Palmitic (16:0), stearic (18:0), oleic (18:1), linoleic (18:2), and linolenic (18:3) acids.

§ Type I and II lipoxygenase activity are presented as I and II.