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STORE SOYBEAN SEED PROPERLY TO MAINTAIN HIGH ENERGY SEED QUALITY

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High quality soybean seed are difficult to maintain for extended storage periods. Both germinability and vigor of the seed decline rapidly, even in conditions considered optimum for some field crop seeds.

Studies in progress at the Seed Technology Laboratory show that initial seed moisture, type of storage bag and storage environment are important factors in preserving the quality of soybean seed. In these tests seed of Lee soybeans were artificially conditioned to three different moisture contents, approximately 7, 10, and 13 percent. Seed of each moisture content were put into two types of storage bags, multiwall paper bags and laminated multiwall paper-2 mil polyethylene bags. The bagged seed were stored in three environmental conditions: (1) a controlled temperature-relative humidity environment (6°C. - 30% R.H.): (2) a moderate environment (open warehouse conditions); and (3) a relatively warm environment (inside a commercial Butler bin).

The seed for these tests were obtained from the 1967 harvest season and were of very good initial quality. The seed were placed into storage in July, 1968, and test samples were taken every six months for laboratory evaluation of selected seed quality attributes.

Results

The storage environment in which both temperature and relative humidity were optimally controlled maintained the germinability and vigor of soybean seed at the highest level (highest quality) for a longer period of time regardless of initial seed moisture or type of storage bag.

Table 1 shows that germination was lowered very little during the 18 month storage period in the controlled

environment. However, the cold test, a vigor indicator, did reveal that the higher moisture seed (12+) were declining in vigor after 18 months storage (17 and 38% cold test germination for the seed in the two type bags.)

It is noteworthy that the initially high moisture seed in the laminated multiwall paper-2 mil polyethylene bag declined drastically in cold test germination (to 17%) within 18 months. This indicates that this type bag restricts air movement and consequently prevents rapid moisture equilibration within a short period. The maintenance of high moisture in the seed during the first 6 months storage together with heat of respiration within this closed bag caused the vigor decline. The high moisture seed in the multiwall bag declined in vigor also but at a much reduced rate since seed moisture equilibrated at a lower level within the first 6 months storage.

Soybean seed stored in either the open

warehouse or the Butler bin environments in either bag type began to show reduced germinability after only 6 months storage. The cold test indicated drastic loss in vigor. After 12 months in such storage conditions, the seed had declined in germinability below any economic value, except possibly for the lowest moisture seed in the laminated multiwall paper-2 mil polyethylene bag. The cold test germination for such seed revealed a complete loss in vigor.

The complete undesirability of using laminated paper-polyethylene bags for storing high moisture content seed in environments other than those with controlled temperature and humidity is clearly demonstrated in this study. The highest moisture seed in the laminated multiwall paper-2 mil polyethylene stored in the warehouse and Butler bin germinated only 18 and 8 percent, respectively, after 6 months storage.

Table 1. Comparison of seed moisture, germination percentage and cold test performance of Lee soybeans at 6 month storage intervals as influenced by initial seed moisture, bag type and storage environment.

Storage Bag	Storage Environ.	Seed Moisture (%)				Germination (%)				Cold Test Germ. (%)			
		1968		1969		1968		1969		1968		1969	
		6/7	12/7	6/7	12/7	6/7	12/7	6/7	12/7	6/7	12/7	6/7	12/7
Laminated Paper-Polyethylene	Cold	7.2	7.6	7.6	6.9	90	93	90	97	59	46	45	50
		10.4	9.8	9.1	9.3	92	94	94	87	62	52	55	58
		12.8	12.1	9.6	9.8	90	88	89	87	55	43	40	17
Multiwall Paper	Cold	7.5	7.2	7.5	6.8	92	88	89	87	52	47	46	58
		10.7	7.0	7.5	7.5	90	94	89	92	56	41	41	41
		12.3	7.5	7.9	7.4	92	92	77	85	54	48	43	38
Laminated Paper-Polyethylene	Ware-house	7.2	7.8	7.7	7.5	90	91	82	85	59	33	32	10
		10.4	10.9	8.9	10.9	92	91	72	76	62	8	-	-
		12.8	12.4	-	-	90	18	-	-	55	-	-	-
Multiwall Paper	Ware-house	7.5	9.0	8.5	7.3	92	86	78	29	52	3	-	-
		10.7	9.8	8.4	-	90	76	59	-	56	2	-	-
		12.3	10.3	-	-	92	57	-	-	54	-	-	-
Laminated Paper-Polyethylene	Bin	7.2	8.3	8.2	-	90	89	87	-	59	28	-	-
		10.4	10.4	8.7	-	92	81	62	-	62	5	-	-
		12.8	12.1	-	-	90	8	-	-	55	-	-	-
Multiwall Paper	Bin	7.5	10.4	10.6	-	92	81	70	-	52	2	-	-
		10.7	11.5	9.0	-	90	62	36	-	56	-	-	-
		12.3	11.0	8.6	-	92	60	32	-	54	-	-	-

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