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## Abstract

The seed storage environment greatly influences the period of seed survival. The study was conducted with the objective of to determine the seed quality losses associated with the use of different types of packaging materials during storage under farm condition. The sesame seeds were stored in the farmers' houses using two types of packaging materials, woven polypropylene bags and pioneer superbags. The data were recorded before storage and every two-month during the storage period of eight months. The results showed that the means of germination percentage and germination index of pre-monsoon seeds stored in woven polypropylene bag was significantly higher than that of stored in superbag, however, the effect of packaging materials could not influence on the germination percentage and germination index of post-monsoon sesame seeds. Regarding storage duration, germination percentage and germination index were significantly varied among the storage durations of both pre-monsoon and post-monsoon seeds. Although the seedling vigour index I and II of pre-monsoon seeds stored in woven polypropylene bag were significantly higher than that of stored in superbag, the seedling vigour index I and II of post-monsoon seeds were not affected by different packaging materials. The seedling vigour index I and index II of pre- and post-monsoon seeds varied significantly among storage durations. Germination was different between packaging materials in pre-monsoon sesame storage. The germination of stored seeds in superbag was significantly lower than that in woven polypropylene bag, whereas, this effect was not observed in post-monsoon sesame.

## Introduction and Objective

The seed storage environment greatly influences the period of seed survival. The type of packaging during storage supposes relevant importance on seed, and the packaging indeed helps on lessening the speed of deterioration by maintaining the initial moisture content of seeds stored, and by diminishing, or not, their respiration rate (Brooker et al. 1992). The study was conducted with the objective of to determine the seed quality losses associated with the use of different types of packaging materials during storage under farm condition.

## Methodology

This study was conducted in collaboration with the sesame farmers during the period from August 2016 to March 2017 in Pwintphyu Township (pre-monsoon seed storage) and from January 2017 to August 2017 in Pakokku Township (post-monsoon seed storage). The sesame seeds were stored in the farmers' houses using two types of packaging materials, woven polypropylene bags and pioneer superbags. The data were recorded before storage and every two-month during the storage period of eight months.

## Result and Discussion

The means of germination percentage and germination index of pre-monsoon seeds stored in woven polypropylene bag were significantly higher than that of stored in superbag, and these were differently observed among storage durations. The germination percentage and germination index of pre-monsoon sesame seeds were significantly different by the combined effect of packaging materials and storage durations. It can be said that the changes of germination percentage and germination index during storage period depended on the packaging materials. The differences of mean effect of packaging materials and storage duration were observed in seedling vigour index I and II of pre-monsoon sesame, and there was significant interaction between packaging materials and storage duration (Table 1). The changes of seedling vigour index I and II with storage duration depended on the packaging materials.

The means values of germination percentage and germination index of post-monsoon sesame were statistically similar between two packaging materials, superbag and woven polypropylene bag. The effect of packaging materials could not influence on the germination percentage and germination index of post-monsoon sesame seeds. The mean differences of germination percentage and germination index of post-monsoon sesame were significant among storage durations (Pr<0.0001). The interaction effect between packaging materials and storage durations exhibited non-significant effects on germination percentage and germination index of post-monsoon sesame. This means that the germination percentage and germination index which varied with storage duration was not dependent on the packaging materials. Seedling vigour index I and II of post-monsoon seeds treated by different storage containers were not different, however, it varied significantly among storage durations. And no interaction effect between packaging materials and durations on seedlings vigour index I and II was recorded (Table 2).

## Conclusion

Black sesame cultivated in both pre-monsoon and post-monsoon season had dormancy with different dormancy period, and the effect of packaging materials on dormancy release time was not observed in both seasons. Therefore, hermetic storage can be used in post-monsoon sesame without adverse effect on germination. However, hermetic storage was not suitable for pre-monsoon sesame in current situation, which had negative effect on germination and it is necessary to conduct more research to solve this problem.

Table 1. Mean effects of packaging materials and storage durations on the quality of pre-monsoon sesame

Treatment	Germination (%)	Germination index	Seedling vigour index I	Seedling vigour index II
<b>Packaging materials (P)</b>				
Superbag	31.583 b	6.821 b	0.055 b	226.520 b
Woven polypropylene bag	51.708 a	12.197 a	0.086 a	390.570 a
LSD0.05	6.207	1.610	0.012	50.666
<b>Storage duration (D)</b>				
Initial storage	1.583 d	0.720 e	0.003 d	14.010 d
2 month	22.979 c	6.264 d	0.043 c	181.910 c
4 month	38.208 b	9.885 c	0.064 b	228.050 c
6 month	74.604 a	16.625 a	0.119 a	637.790 a
8 month	70.854 a	14.052 b	0.124 a	480.970 b
LSD0.05	9.814	2.546	0.019	80.109
<b>Pr &gt; F</b>				
P	<0.0001	<0.0001	<0.0001	<0.0001
D	<0.0001	<0.0001	<0.0001	<0.0001
P x D	0.0010	0.0001	0.0099	0.0002
CV (%)	28.66	32.57	32.08	31.58

In each column, means having a common letter are not significantly different at 5 % LSD.

Table 2. Mean effect of packaging materials and storage durations on the quality of post-monsoon sesame

	Germination (%)	Germination index	Seedling vigour index I	Seedling vigour index II
<b>Packaging materials (P)</b>				
Superbag	74.317 a	18.637 a	0.142 a	618.290 a
Woven polypropylene bag	74.375 a	19.148 a	0.143 a	620.640 a
LSD0.05	5.226	1.626	0.016	45.080
<b>Storage duration (D)</b>				
Initial storage	26.750 c	8.800 c	0.045 c	174.050 d
2 month	65.333 b	17.645 b	0.119 b	566.170 c
4 month	94.625 a	22.585 a	0.182 a	669.290 b
6 month	94.521 a	23.412 a	0.173 a	951.510 a
8 month	90.500 a	22.017 a	0.195 a	734.290 b
LSD0.05	8.263	2.572	0.025	71.278
<b>Pr &gt; F</b>				
P	0.9822	0.5298	0.8417	0.9167
D	<0.0001	<0.0001	<0.0001	<0.0001
P x D	0.7791	0.1849	0.6766	0.8691
CV (%)	13.52	16.55	21.08	13.99

In each column, means having a common letter are not significantly different at 5 % LSD.

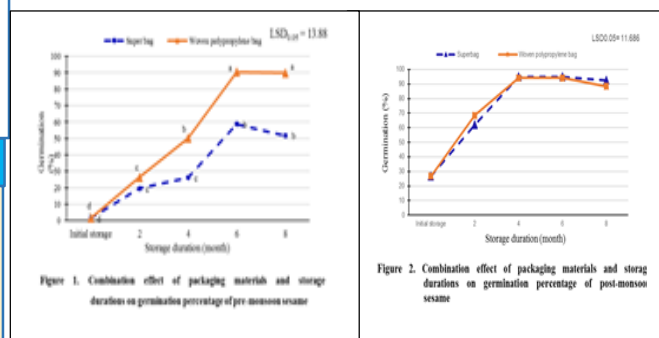


Figure 2. Combination effect of packaging materials and storage durations on germination percentage of post-monsoon sesame

LSD0.05 = 11.88