Effect of Seed Age on Viability of Faba Bean and Haricot Bean and Field Performance of Faba Bean

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Abstract

This work investigated the effect of seed age on the viability of faba bean and haricot bean seeds plus the effect on performance of faba bean in the field. The results indicated that storage of faba bean for more than five years sharply decreased the viability of seed and yield, while the viability of haricot bean seed was significantly reduced after four – years storage.

Introduction

The work reported herein was conducted at Hudeiba Research Station in 1974-75 season. Farmers in the traditional areas of faba bean and haricot bean production, are usually not keen to use new seed for raising their crops. It is well known that haricot bean, in particular, stores well for a number of years and seldomly been attacked by store pests (fortunately the specific store pest of this crop is not found in the Sudan). This fact sometimes had deceived farmers to use old seed for raising their crops and consequently face crop failures. Therefore, the present study was carried to investigate the effect of seed age on seed viability and field performance of faba bean, and seed viability of haricot bean.

Materials and Methods

a) Faba Bean

The local variety "Beladi" of faba bean was stored incidentally for a number of years ranging from one to eight years under lab conditions. The store conditions were more or less similar to those of farmers' stores in the region. Two tests were carried: One in the lab, to detect the germinability of the seeds and the other in the field to test the field performance.

For the laboratory test, each of the eight treatments was composed of 75 seeds. Three replicates were used. All conditions for good germination were provided. Assessment was done 14 days after sowing.

For the field rest, seven treatments were included since the seven – years – old lot was lacking. The trial was executed in a randomized complete block design with three replications. Every plot included seven rows of seven metres length. The usual agronomic practices were followed. The attributes measured were: emergence percentage, number of days to 50% flowering and seed yield.

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b) Haricot bean

The material consisted of nine seed lots stored, incidentally, for periods ranging from one to nine years. A total of 75 seeds from each treatment was taken. Three replications were used. The proper conditions for seed germination were provided. Count of germinated seeds was done 10 days after sowing. No field test was carried because of shortage in seed.

Results and Discussion

a) Faba Bean

The laboratory test showed that seed age influenced viability drastically (Table 1, Fig. 1). The germination percentage of the three older seed lots were significantly lowered.

The field results were presented in Table 2 and Fig. 2. Significant differences were obtained for seed yield and emergence percentage. The two older seed treatments gave significantly low yields. Storing of faba bean seed for up to five years did not affect yield significantly, yet the crop yield tended to drop constantly with seed age (Fig. 2).

These results necessitate the use of new seed for raising faba bean. In any case the age of the seed sown should not exceed five years.

b) Haricot bean

The results were shown in Table 3 and Fig. 3. It was clear that seeds stored for up to four years did not show significant decrease in viability, while seeds stored for five years gave a little drop. Seeds stored for six years showed a sharp drop in viability while seeds stored for more than that were practically dead.

Recommendation

For raising faba bean and haricot bean it is recommended to use new seed.
In any case the age of seed sown should not exceed five years for faba bean and four years for haricot bean.

Table 1. Effect of seed age on germination of faba bean

Seed age in years	Germination % age
Eight	19.9 c*
Seven	34.6 b
Six	44.0 b
Five	87.7 a
Four	94.8 a
Three	93.5 a
Two	91.3 a
One	92.3 a

*Values with a common letter are not significantly different at the 5% level according to Duncan's Multiple Range Test

Table 2. Effect of seed age on some attributes of faba bean.

Seed age in years	Emergence %	Days to 5% flowering	Seed yield (kg/ha)
Eight	13.7 d*	51	103.6 c
Six	40.8 c	50	208.6 b
Five	48.7 bc	49	1104.0 a
Four	71.3 ab	48	1238.8 a
Three	75.1 ab	48	1411.7 a
Two	86.1 a	48	1567.6 a
One	92.1 a	47	1738.8 a

* Values with a common letter are not significantly different at the 5% level according to Duncan's Multiple Range Test

Table 3. Effect of period of storage on germination of haricot beans.

Seed age year	Germination
Nine	0
Eight	0
Seven	0
Six	19.1 c*
Five	82.2 b
Four	96.0 a
Three	96.6 a
Two	94.8 ab
One	95.2 ab

- Values with a common letter are not significantly different at the 5% level according to Duncan's Multiple Range Test

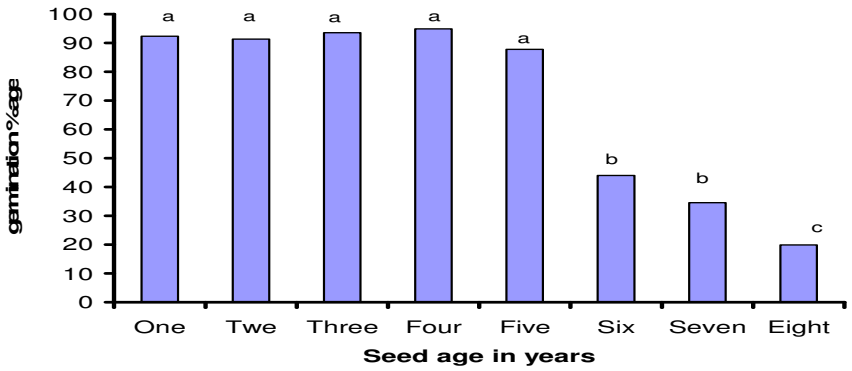

Fig. 1. Effect of seed age on germination of faba bean

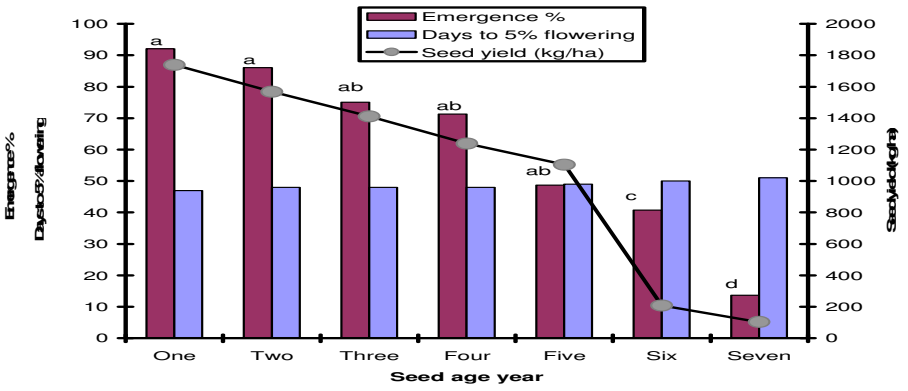

Fig. 2. Effect of seed age on some attributes of faba bean

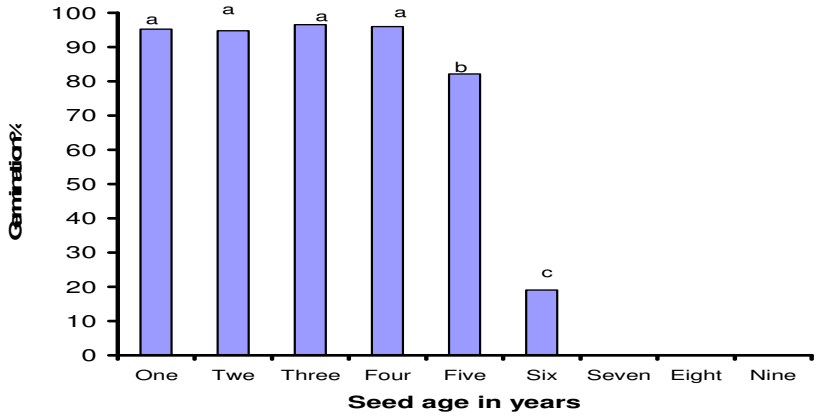

Fig. 3. Effect of period of storage on germination of haricot beans