

Contents

	<i>Page</i>
Introduction	1
Review of literature	4
Materials and methods	25
Results and discussion	35
1- VEGETATIVE GROWTH	35
1- Stem diameter (cm).....	35
2- Number of total flowers/plant	39
3- Number of setting flowers/plant	42
4- Plant height (cm)	46
3- YIELD AND ITS COMPONENTS	53
1- Number of branches/plant	53
2- Number of pods/plant	55
3- Pods weight/plant (g)	57
4- Number of seeds/plant	62
5- Seed yield (g)/plant	64
6- Pod length (cm)	68
7- Pod weight (g)	75
8- Number of seeds/pod	79
9- 100 – seed weight (g)	81

	<i>Page</i>
10- Number of plants/m ²	85
11- Seed yield (ardab/fad)	88
3- SEED AND SEEDLING QUALITY	96
1- Protein percentage (%).....	96
2- Germination percentage	98
3- Speed of germination	102
4- Shoot length (cm).....	106
5- Root length (cm)	107
6- Seedling dry weight (g)	110
7- Germination % after ageing	112
8- Electrical Conductivity test (EC)	116
SUMMARY	118
REFERENCES	126
ARABIC SUMMARY	

SUMMARY

Two field experiments were conducted at Tag AL-Ezz, Agricultural Research Station Farm, Dakahlia Governorate, Agricultural Research Center, Egypt, during 2007/2008 and 2008/2009 seasons to study the effect of planting dates (20th October, 10th November and 1st December) and size of sown seeds (small, medium and large) of some faba bean cultivars (Sakha 1, Masr 1 and Giza 843), as well as, their interaction on yield and its components and seed quality.

In addition, a laboratory experiment was carried out at Seed Technology Research Unit at Mansoura, Dakahlia Governorate, Field Crops Research Institute, Agricultural Research Center, Egypt, to assess some physiological and seed quality of seed resulted from the field experiments.

Field trials were performed in six experiments in which two for each sowing date during 2007/2008 and 2008/2009 seasons. The treatments included three planting dates which were:-

- 1- 20th October.
- 2- 10th November.
- 3- 1st December.

The studied faba bean cultivars were;

- 1- Sakha 1.

SUMMARY

2- Masr 1.

3- Giza 843.

While sowing seed sizes were;

1- Small.

2- Medium.

3- Large.

Three experiments for planting dates were performed. Every experiment of planting date was carried out in split plot design with four replications. The main plots were occupied with faba bean cultivars. whereas, the sub plots were assigned to size of sown seeds.

❖ *The following observation were recorded:*

1- Vegetative growth:

1.1- Stem diameter (cm).

1.2- Number of total flowers/plant.

1.3- Number of setting flowers/plant.

1.4- Plant height (cm).

2- Yield and its components:

2.1- Number of branches/plant.

2.2- Number of pods/plant.

SUMMARY

- 2.3- Pods weight/plant (g).
- 2.4- Number of seeds/plant.
- 2.5- Seed yield (g)/plant.
- 2.6- Pod length (cm);
- 2.7- Pod weight (g).
- 2.8- Number of seeds per pod.
- 2.9- 100 – seed weight (g).
- 2.10- Number of plants/m².
- 2.11- Seed yield (ardab/fad)

3- Seed seedling quality:

- 3.1- Protein percentage (%).
- 3.2- Germination percentage
- 3.3- Speed of germination.
- 3.4- Shoot length (cm.
- 3.5- Root length (cm.
- 3.6- Seedling dry weight.
- 3.7- The accelerated ageing test (Germination after ageing test).
- 3.8- Electrical conductivity test (EC).

SUMMARY

- *The most important results obtained from the experiment can be summarized as follows:*

A. EFFECT OF Planting dates effect:

1- Growth, seed yield and its components:

Planting dates caused significant effects on faba bean growth, seed yield and its components in both seasons. Intermediate planting date (10th November) markedly resulted in the highest values of stem diameter, number of total and setting flowers, plant height, number of branches/plant, number of pods/plant, pods weight/plant, number of seeds/plant, seed yield/plant, pod length, pod weight, number of seeds/pod and 100 – seed weight as well as seed yield/fed as compared with other studied planting dates in both seasons. Early planting date (20th October) ranked second after intermediate planting date. Late planting date (1st December) showed the lowest values of seed yield and its components in both seasons.

2- Seed quality:

There were significant differences among the three planting dates on faba bean seed quality in both seasons. The most marked and maximum values of seed quality characters such as protein, germination percentages, speed of germination, shoot and root length, seedling dry weight and germination after ageing were resulted from the intermediate planting date in November 10th followed by early and then late planting dates.

B. Cultivars performance:

1- Growth seed yield and its components:

Significant differences among the three tested cultivars of faba bean for stem diameter, number of total and setting flowers, plant height, number of branches/plant, number of pods/plant, pods weight/plant, number of seeds/plant, seeds yield/plant, pod length, pod weight, number of seeds/pod and 100 – seed weight as well as seed yield/fed in both seasons. Sakha 1 cultivar significantly surpassed other studied cultivars (Giza 843 and Masr 1) in all yield component characters and also seed yield/fed, which recorded the highest values of all characters in the two growing seasons. Whereas, the last rank values were obtained from Masr 1 cultivar in both seasons. It is worthy to mention that the differences among studied cultivars were significant in seed yields and its components in both seasons, except for the pod weight (in the first season) and number of seeds/pod (in the second season).

2- Seed and seedling quality:

The results exhibit significant differences among cultivars in seed quality characters *i.e.* protein, germination percentages, speed of germination, shoot and root length, seedling dry weight and germination after ageing in both seasons. Sakha 1 cultivar significantly surpassed other cultivars and produced the highest values of previously mentioned traits. Varieties could be descendingly arranged according to seed quality traits as follows: Sakha 1, Giza 843 and Masr 1.

C. EFFECT OF Seed size:

1- Growth seed yield and its components:

The results clarified that size of sown seeds had significant effects on stem diameter, number of setting flowers, plant height, number of branches/plant, number of pods/plant, pods weight/plant, seed yield/plant, pod length, pod weight, number of seeds/pod and 100 – seed weight as well as seed yield/fed in both seasons, except for the number of setting flowers in the first season and pod weight as well as number of seeds/pod in the second season. Large size of sown seeds markedly recorded the highest seed yield and its components compared with medium and small seed size in both seasons. Conversely, the lowest values of these characters were obtained from small size of sown seeds in both seasons. However, there were insignificant differences between sown faba bean by large or medium seed size with respect of pod weight and 100-seed weight (in the first season), number of branches/plant and number of seeds/pod (in the second season) as well as seed yield/fed (in both seasons).

2- Seed and seedling quality:

The effect of seed size on seed quality characters was significant, except for seedling dry weight in the second season. Planting faba bean with large seed size significantly produced the highest values of quality characters *i.e.* protein and germination percentages, speed of germination, shoot and root length, seedlings dry weight as well as germination after ageing in both seasons. Whereas, planting faba bean by using medium seed size gave the best values of

SUMMARY

quality characters followed large seed size in the two growing seasons, and without significant differences respecting speed of germination (in the first season) and dry weight seedlings (in the second season). On the other hand, planting small seed size resulted in the lowest values of these characters in both seasons.

D. EFFECT OF INTERACTIONS:

1- The interaction between planting dates X cultivars:

Our results indicated that there was significant effect between planting dates X cultivars on all studied characters in both seasons, except number of branches/plant, pods weight/plant, pod weight and number of seeds/pod, speed of germination, Shoot length, root length and seedling dry weight and EC in both seasons.

2- The interaction between planting dates X seed size:

It had a significant effect on plant height, number of pods/plant, pod length and germination % in both seasons as well as seeds yield per plant and feddan in the first season.

3- The interaction between cultivars X seed size:

The results appears a significant interaction between cultivars X seed size on plant height in both seasons as well as seeds yield per plant and feddan in the first season.

SUMMARY

4- The interaction among the three factors:

Non of the interactions among the three studied factors had a significant effect on all studied characters in any of the two seasons under the local conditions of the present investigation except for seeds yield per plant and feddan in the first season.

CONCLUSION

According to the obtained results from this study, it can be concluded that, planting faba bean Sakha 1 cultivar on 10th November with large or medium size seeds could be recommend to raise faba bean productivity and seed quality under the environmental conditions of Tag El-Ezz district, Dakahlia Governorate.