CULTURAL AND CHEMICAL EVALUATION OF SOME INTRODUCED VARIETIES OF BEANS (PHASEOLUS VULGARIS, L.)

By

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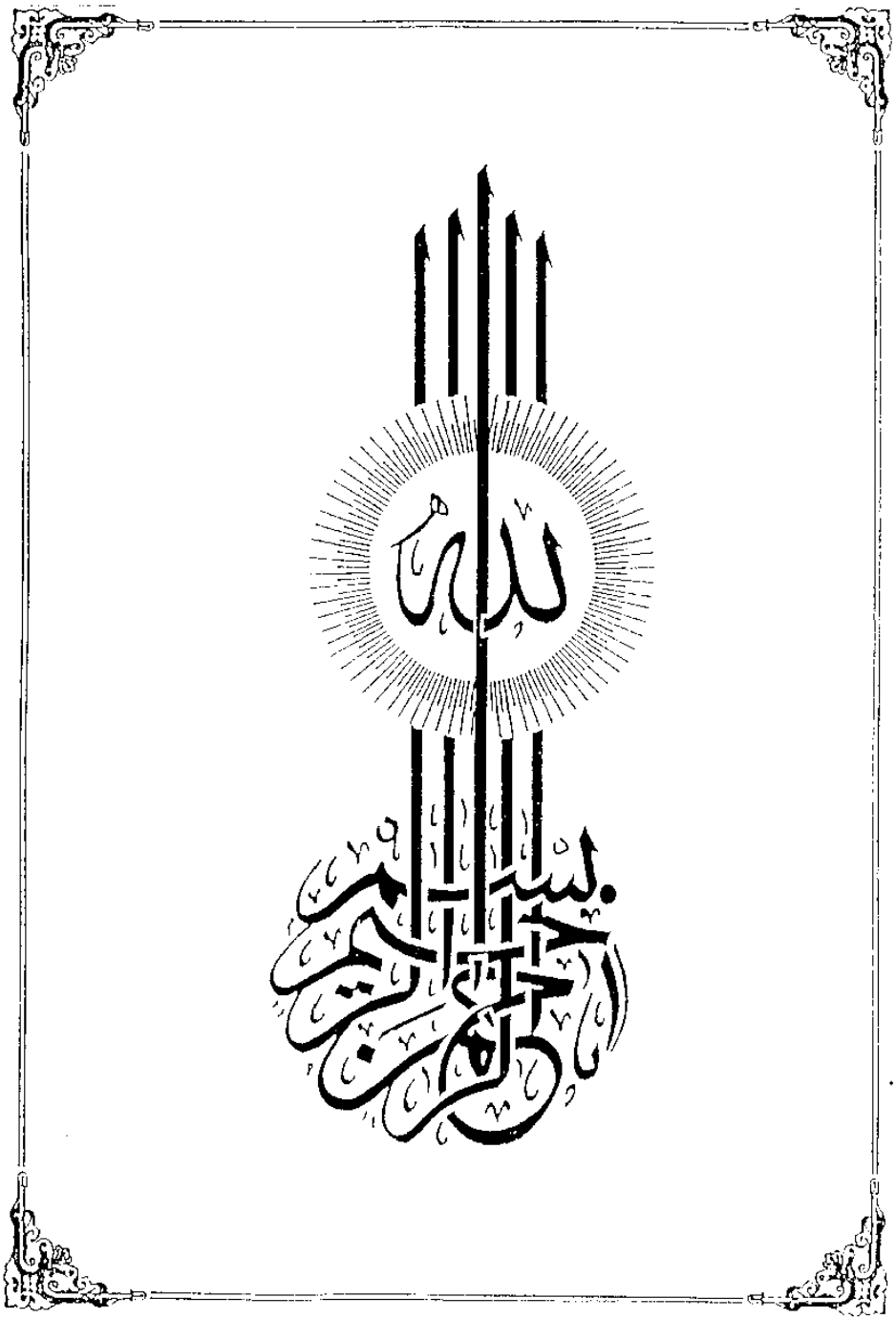

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ARABIC SUMMARY

CHAPTER 1

INTRODUCTION

CHAPTER 1

INTRODUCTION

Snap bean (Phaseolus vulgaris, L.) is one of the most important leguminous crops grown in the A.R.E. both for local consumption and export. It is cultivated for seeds and pods which are used as green snaps. The average annual acreage amounted to 572, 2817, 6000, 19359, 21561, 23831 and 25784 feddan respectively in 1929, 1939, 1949, 1965, 1970, 1971 and 1972 showing a marked increase in the total acreage during the last four decades.

Snap bean is considered one of the most highly nutritional crop, as its seeds contain high proportions of protein, and its protein has relatively high content of essential amino acids as Arginine, Histidine, Isoleucine, Leucine, Methionine, Threonine and Valine, and it is a cheap source for carbohydrate as starch constitutes 22:43% of the whole grain. Its seeds contain high proportion of minerals.

Agronomists and plant breeders are pressing hard to produce snap bean cultivars of high cook's quality having a good yield to meet the increasing demand of for human consumption and the tonnage for export.

For raising the yield of unit area, the scientists should either to select for a high yield varieties or improving the cultural methods.

This work was performed to evaluate some imported cultivars of snap bean with respect to their growth and response to phosphate application and yield of snap bean; chemical composition of the different parts of plants. Beside starch of the good cooking quality and bad cooking quality beans was also separated in a trial to study its behaviour and composition and correlate that with the cooking quality of its beans.

CHAPTER 2

REVIEW OF LITERATURE

CHAPTER 2

REVIEW OF LITERATURE

2.1. Growth Studies

So far the author is aware, the literature dealing with the relation between phosphorus application and the growth of snap bean plant is quite scarce. However the effect of the phosphorus application on the growth of other legumes was investigated.

Vieira and Gomes (1961), found that growth of beans was responsed to phosphorus application.

Hassan (1966), reported that phosphorus as spray on the foliage increased the fresh weight of plants more than soil phosphorus addition did. The sprayed plants also gave earliness in flowering.

Results by Lunin and Gallatin (1966), confirmed that a growth response was obtained from snap beans only when phosphorus was added.

Osawa and Lonrenz (1968), demonstrated that low phosphorus levels produced small plants with dull green leaves.

Similar results were obtained with other vegetable crops.

Working on Vicia faba Ahmed (1946), concluded that the continued sufficiency of phosphorus in later stages of growth reduced the rate of growth of tops and seemed likely to depress the number of fruit.

Hassan (1957), demonstrated that the growth of peas tops and roots responsed significantly to phosphorus application. The fresh weight of pods and the number of pods per plant showed a positive response to increasing phosphorus concentration in the nutrient solution. He added that, the phosphorus deficient plants could not initiate any flowers and branches.

Soybean plants produced shorter stems and lighter pods when phosphorus was depleted as reported by Murayama and Kawaraski (1957).

Kadry et al. (1958), during his experiment on Vicia faba plants on sand culture suffering from phosphorus deficiency, indicated reductions in growth.

Working on soybean, Howell (1959), pointed out that an increase in the phosphorus level in the nutrient solution from 2 to 10 ppm., produced taller and heavier plants.

Working on cowpea, Shanan (1963) found that phosphatic fertilizer sometimes significantly affected the height of the main stems. He, however, noticed no response in the number of branches per plant.

Andreeva and Persanov (1970), using horse beans, showed that deficiency of phosphorus in the water culture decreases plant productivity.

2.2. Dry matter content:

In fact, dry matter, known to be a way for expressing the growth of plant, should generally followed the same behaviour followed by the tested morphological characteristics.

Apple and Butts (1953), observed significant effects of soil applied phosphorus on the dry weights of plants.

Massantini (1971), showed that legumes can be able to uptake phosphorus than cereals. He added that legumes utilized its phosphorus efficiently in producing dry matter.

In spite of that, Maydan (1972), reported no significant effect for the phosphorus application on dry matter content of the tested plants.

Several investigations were reported for other legumes.

Goma (1964), working on cowpea, found no association between the dry matter content of the different parts of the plant (leaves, branches and pods) and the application of calcium superphosphate.

Badawi (1965), indicated an association between the dry matter content of the different parts of soybean plant, i.e. leaves, branches and pods and phosphatic fertilizer. He added that the dry matter content in leaves, branches and pods increased by adding calcium superphosphate up to 200 Kg. per feddan.

2.3. Chemical Contents

2.3.1. N, P and K:

Chemical contents of plants was correlated by the relationship between cultivars, years, stage of plant development, part of the plant and phosphate application.

Several investigations confirmed these results.

Gallo and Miyasaka (1961), found that pods and seeds contained more phosphorus than the other organs; on the other hand, leaf content was high in potassium.

Barr and Ulrich (1963), showed that a positive correlation between phosphate supply and concentration of phosphate fraction in the leaflet blades and petioles of lima beans.

Hassan (1966), reported that phosphorus content increased in the vegetative organs and seeds by foliar spray with phosphorus.

Peneva (1966), indicated that phosphorus contents in seeds varied with cultivar of beans.

Stephens (1967), found that leaf analysis was a guide to the phosphorus status of the plant.