

# SUMMARY

## 5- SAMMARY AND CONCLUSION

Two field experiments were conducted during two successive summer seasons of 2000 and 2001, at the Experimental Farm of the Vegetable at Kaha, Agricultural Research Center (ARC), Ministry of Agriculture Dokki Giza, Egypt, to investigate the effect of phosphatic fertilization either in the mineral form or bio form (phosphate dissolving bacteria) on vegetative growth, chemical composition, yield and its attributes as well as dry seed yield and its quality for Bronco and cvs. Giza 6. of common bean (*Phaseolus vulgaris*, L.).

This study included 18 treatments, which were the combination of two common bean i.e. cvs. Giza 6 and Bronco within 9 treatments of phosphatic fertilizer i.e. phosphorine at 0.5 and 1 kg / fed., phosphorus at 30 or 60 kg  $P_2O_5$  /fed., 0.5 kg phosphorine +30 or 60 kg  $P_2O_5$  and 1 kg phosphorine + 30 or 60 kg  $P_2O_5$  in addition to the check treatment . A split plot design with four replicate was adopted where the two cultivars were distributed in the main plots and fertilization treatments in the sub- plots . Vgetative growth characteristics , chemical constituents of plant folieg ( stem and leaves ) flowering characteristics ( date of flowering, number of flowers / plant and pods setting percentage ) , green pods yield and its components , dry seed yield and its attributes , seeds chemical composition and seeds quality ( 100 seeds weight , germination percentage and germination rate) were studied . Obtained results reveled the following:

1. There were a differences among the studied cultivars in all the studied growth aspects i.e plant height, number of leaves and branches per plant, average leaf area, fresh and dry weight of plant. In this regard, cv Giza 6. reflected the highest values in all the studied growth aspects.
2. Vegetative growth characteristics i.e. plant height, number of leaves and branches per plant, average leaf area, fresh and dry weight / plant were increased with the application of phosphatic fertilizer either in mineral or bio form compared with the control. In this respect, application of phosphorine at rate of 0.5 kg + phosphorus at 60 kg  $P_2O_5$  / fed. Reflected the highest values for the vegetative growth. However, no significant differences can be noticed in all the studied morphological characteristic due to the interaction effect.
3. Total nitrogen and potassium content was significantly increased while phosphorus was not affected among the studied cultivars during both seasons of study. In this respect, the highest values of such macro-elements were obtained in case of cv. Bronco.
4. Total nitrogen, phosphorus and potassium content of plant foliage (stem and leaves) were significantly increased with the addition of phosphatic fertilizer. In this connection, application of phosphorine at rate of 1 kg + phosphorus at 60 kg  $P_2O_5$ / fed. resulted in the highest contents.
5. The interaction effect between cultivars and phosphatic fertilizers had a significant effect on total nitrogen and

potassium content but did not affect phosphorus content of plant foliage during both seasons of study.

6. There were significant differences among the studied cvs. in date of flowering, total number of flowers per plant and the setting percentage during both seasons of growth.. cv. Bronco was superior in number of flowers/ plant and the setting percentage while cv. Giza 6 was earlier in flowering time.
7. Application of phosphatic fertilizer either in mineral or bio form led to a decrease in number of days elapsed from sowing up to flowering (50% of plants) and an increase in number of flowers and setting percentage. Addition of phosphorine at rate of 0.5 kg + 60 kg  $P_2O_5$  / fed. gave the best results in this regard.
8. Date of flowering was significantly affected but number of the flowers and setting percentage were not significantly affected due to the interaction.
9. Green pods yield either per plant or feddan as well as average pod length, diameter and weight were significantly different among the subdivide cultivars, cv. Giza 6 has the highest value of average pod length, diameters and weight while cv. Bronco has the highest value of the total produced yield for plant and feddan.
10. Green pods yield expressed as pods yield / plant and total pods yield / fed. As well as average pod length, diameter and weight were significantly increased with the addition of phosphatic fertilizer as mineral or bio form compound with the check treatment. Addition of phosphorine at 0.5

kg + 60 kg  $P_2O_5$  / fed. gave the highest total green pods yield with best quality. However, no significant differences were noticed in the total green pods yield and pod quality due to the interaction affect during both season of study.

11. No significant differences were noticed among the studied cultivars in total dry seed yield either per plant or per feddan. However, cv. Bronco produced pods with highest number of seeds per pod compared with cv. Giza 6 .
12. Application of phosphatic fertilizer either in bio or mineral form at the different rates increased number of seeds per pod, seed yield per plant and per feddan. The highest produced yield was obtained by the application of phosphorine at 0.5 kg + phosphorus at 60 kg  $P_2O_5$  / fed. No significant differences were noticed due to the interaction in this respect.
13. Seeds chemical constituents of N, P and K as well as soluble , non soluble and total sugars were significantly affected due to the cultivars. In this connection, cv. Bronco produced seeds with highest content of all estimated chemical constituents compared with cv. Giza 6.
14. Phosphatic fertilizers either in bio or mineral form at this used levels increased total nitrogen, phosphorus, potassium, soluble , non soluble and total sugars content of produced dry seeds compared with the control treatment. Application of 1 kg phosphorine + 60 kg  $P_2O_5$  / fed. Led to the highest chemical constituents of produced seeds.

15. Seeds chemical constituents of total nitrogen, phosphorus, potassium, soluble non soluble and total sugars were affected due to the interaction. Such effect did not reach the level of significance in case of total nitrogen and potassium content during the first season only.
16. Seeds quality of weight of 100 seeds, germination percentage and germination rate were significantly affected among the studied cultivars. In this regard , cv. Giza 6 show the highest values in all studied seed quality .
17. Application of phosphatic fertilizer either in bio or mineral form increased 100 seeds weight, germination percentage and germination rate of produced seeds compared to the control. Addition of phosphorine at rate of 0.5 kg /fed. + phosphorus at 60 kg  $P_2O_5$  /fed. reflected the highest weight of 100 seeds, the highest values of germination percentage and germination rate.
18. Except the weight of 100 seeds which was significantly affected , germination rate and percentage were not affected due to the effect of the interaction during both seasons of study .

### **Conclusion: -**

Under such condition of the experiment, Bronco combined with phosphatic fertilizer at rate of 0.5 kg phosphorine + 60 kg  $P_2O_5$  /fed. were recommended for obtaining the highest green pods yield with best quality while cv. Giza 6 with the same rate of bio and mineral phosphorus were recommended for higher seed production with the highest quality.