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SUMMARY AND CONCLUSION

Gladiolus grandiflorus. L. is one of the most attractive showy and nice flowering – plants. It has super cut flowers with extremely wide color range, used in borders, beds and large containers in gardens and landscape. It is also extensively demanded in both local and foreign markets. *Gladiolus grandiflorus* cv. Rose supreme, which has been introduced to Egypt among other cvs. during the recent decades is characterized with rose flowers and is a handsome desirable and usable flowering bulb.

Two field experiments were carried out during two successive seasons of 2001 / 02 and 2002 / 03 at El – Mattaana Agricultural Research Station in Kena Governorate.

The first one aimed to explore the response of *Gladiolus grandiflorus* plant to mineral phosphorus fertilization sources (calcium superphosphate and rockphosphate) and P – dissolving bacteria (*Bacillus megatherium* and phosphorein) treatments in terms of vegetative growth characters, flowering parameters, corm and cormels production and chemical composition, while, the second experiment was executed to explore the response of gladiolus plant to mineral nitrogen fertilization sources (ammonium sulphate and ammonium nitrate) and N– fixing bacteria (Azotobacter) treatments in terms of vegetative growth characters, flowering parameters, corm and cormels production and chemical composition.

The obtained results could be summarized as follows :

First Experiment :

Effect of mineral phosphorus fertilization :

Vegetative growth characters :

Different vegetative growth characters i.e. number of leaves / plant, leaf area and fresh and dry weight of leaves / plant were considerably augmented as a result of supply gladiolus plants with the low, medium and high mineral phosphorus fertilization levels P_1, P_2 and P_3 (calcium superphosphate) and P_4, P_5 and P_6 (rockphosphate). Moreover, such augment was gradual by the gradual increase in the two phosphorus sources rates, where, the high rate from either calcium superphosphate or rockphosphate (P_3 or P_6) gave the highest values.

Flowering Parameters :

Number of days from planting till flowering was not significantly affected by different rates from either superphosphate or rockphosphate treatments.

Other flowering parameters including, spike fresh weight, spike length, spike diameter, number of florets / spike and fresh weight of single floret were remarkably increased due to the different phosphorus fertilization treatments. Such increase was due to the use of the high rates from either superphosphate and rockphosphate at (300 and 600 kg / fed.), respectively.

Corm and cormels production :

Corm and cormels production including corm diameter, corm weight and cormels number / plant, were significantly increased due to the application of either mineral phosphorus fertilization sources, superphosphate and rockphosphate. The increase in these characters was

gradually parallel to the gradual rise in phosphorus level. The highest corm diameter, corm dry weight and cormels number were obtained due to the use of superphosphate at 300 kg / fed. and rockphosphate at 600 kg / fed.

Chemical Composition :

Both P % and P contents were significantly increased due to the application of either mineral phosphorus fertilization source, superphosphate or rockphosphate. The increase was gradually parallel to the gradual rise in phosphorus level. The highest values were obtained due to the use of superphosphate at 300 kg / fed. or rockphosphate at 600 kg / fed.

Effect of P – dissolving bacteria :

Vegetative growth characters :

All of the examined vegetative growth traits, i.e. leaf area, leaves fresh and dry weight and number of leaves / plant, were significantly increased due to the use of *Bacillus megatherium* or phosphorein. Such increases were obtained due to the use of *Bacillus megatherium* at 10 cm^3 / plant or phosphorein at 5 g / plant.

Flowering parameters :

Flowering date was not significantly affected by different P–dissolving bacteria treatments. Meanwhile, all other flowering parameters including spike and floret measurements and weights, were significantly increased due to the use of either P – dissolving bacteria sources (*Bacillus megatherium* or phosphorein).

Corm and cormels production :

All corm and cormels production parameters, including corm diameter, corm weight, as well as, cormels number / plant were considerably and significantly augmented as a result of using different P-dissolving bacteria treatments (*Bacillus megatherium* or phosphorein).

Chemical composition :

Concerning P % and P contents, they were significantly increased due to the use of either *Bacillus megatherium* at 10 cm^3 / plant or phosphorein at 5 g / plant .

Effect of the interaction between P– mineral fertilization and P– dissolving bacteria :

Vegetative growth characters :

The interaction between P – mineral fertilization and P – dissolving bacteria treatments was significant for leaves dry weight in the two seasons, as well as, number of leaves / plant in the second season only. The best overall vegetative growth characters of gladiolus plants, however, were obtained due to the high P – mineral fertilization treatments (P_3 or P_6) in combination with P – dissolving bacteria (*Bacillus megatherium* or phosphorein).

Flowering parameters :

As far as flowering date, spike length, spike diameter and spike fresh weight are concerned, the interaction between the two examined factors was not significant. While, some flowering parameters, such as, number of florets / spike and fresh weight of floret were significantly

improved in both seasons, due to the interaction between P – mineral fertilization and P – dissolving bacteria treatments.

Corm and cormels production :

Concerning corm and cormels production, the interaction between P – mineral fertilization and P – dissolving bacteria treatments was significant for corm diameter in the two seasons. But corm dry weight and cormels number / plant were not significantly affected due to the use of P – mineral fertilization in combination with P – dissolving bacteria.

Chemical composition :

The interaction between P – mineral fertilization and P – dissolving bacteria treatments significantly increased P % and P content in the two seasons. The high values were obtained due to the use of the high rate from either superphosphate or rockphosphate in combination with *Bacillus megatherium* or phosphorein.

Second Experiment :

Effect of Mineral Nitrogen Fertilization :

Vegetative growth characters :

Different vegetative growth characters i.e. number of leaves / plant, leaf area, and fresh and try weight of leaves were significantly increased in both seasons, as a result of supplying gladiolus plants with the mineral nitrogen fertilization sources (ammonium sulphate or ammonium nitrate). Such increase was gradual by the gradual increase in the two nitrogen source rates, where, the high rate from either ammonium sulphate or ammonium nitrate (N_3 or N_6) gave the highest values.

Flowering parameters :

Number of days from planting till flowering was not significantly affected by different rates from either ammonium sulphate or ammonium nitrate treatments. However flowering date was slightly delayed due to the use of the high rate from either source.

Other flowering parameters including, spike fresh weight, spike length, spike diameter, number of florets / spike and fresh weight of single floret were remarkably increased due to different nitrogen fertilization treatments. Such increase resulted due to the use of the high rates from either ammonium sulphate at 200 kg / fed. or ammonium nitrate at 150 kg / fed.

Corm and cormels production :

All corm and cormels production, including corm diameter, corm dry weight, as well as, cormels number / plant, were significantly increased due to the application of either mineral nitrogen fertilization sources, ammonium sulphate or ammonium nitrate. The increase in these characters was gradually parallel to the gradual rise in nitrogen level. The highest rate from either fertilizer source gave the highest values.

Chemical composition :

Both N % and N content were significantly increased in the two seasons due to the use of either ammonium sulphate or ammonium nitrate. The increase was gradually parallel to the gradual rise in nitrogen fertilization level of either fertilizer. The highest values were obtained due to the use of ammonium sulphate at 200 kg / fed. or ammonium nitrate at 150 kg / fed.

Effect N – Fixing bacteria :

Vegetative growth characters :

All of the examined vegetative growth traits, i.e. number of leaves / plant, leaf area and fresh and dry weight of leaves were significantly increased due to the use of *Azotobacter vinelandii* at 10 cm^3 / plant.

Flowering parameters :

Flowering date was not significantly affected by Azotobacter treatment. Meanwhile, all other flowering parameters including spike diameter, spike length, spike fresh weight, number of florets / spike and weight of floret were significantly increased due to the use of Azotobacter at 10 cm^3 / plant.

Corm and cormels production :

All corm and cormels production, including corm diameter, corm dry weight, as well as, cormels number / plant were significantly increased in both seasons due to the use of Azotobacter at 10 cm^3 / plant.

Chemical composition :

Concerning N % and N content, they were significantly increased in the two seasons due to the use of Azotobacter at 10 cm^3 / plant.

Effect of the interaction between N – mineral fertilization and N – fixing bacteria :

Vegetative growth characters :

The interaction between N – mineral fertilization and N – fixing bacteria treatments was significant for leaf area and leaves dry weight in the two seasons. The best results were obtained due to the use of the high

N – mineral fertilization treatments (N_3 or N_6) in combination with *Azotobacter vinelandii*.

Flowering parameters :

Flowering date, spike length, spike diameter and number of florets / spike concerning the interaction between N – mineral fertilization and N – fixing bacteria, were not significant. While, some flowering parameters, such as, fresh weight of floret and spike fresh weight were signification improved in both seasons due to the interaction between N- mineral fertilization and N – fixing bacteria.

Corm and cormels production :

Concerning corm and cormels production, the interaction between N – mineral fertilization and N – fixing bacteria treatments was significant for corm dry weight in both seasons. But corm diameter and number of cormels / plants were not significantly affected due to the use of N – mineral fertilization in combination with N – fixing bacteria.

Chemical composition :

The interaction between N – mineral fertilization and N – fixing bacteria treatments, significantly increased N % and N content in both seasons. The highest values were obtained due to the use of the high rate of either ammonium sulphate or ammonium nitrate in combination with Azotobacter .