SUMMARY

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These experiments were carried out at the ornamental area of the Faculty of Agricultural Science at Moshtohor, Zagazig University.

The aim of this work was to study the effect of different fertilizer level of phosphorus, potassium and iron on the growth, flower yield and essential oil content in the flowers of Sweet peas.

The most important results were:

I- Field experiment

a) Fertilization experiment:

1) Fe sprayed on plants non-fertilized with P and K or the application of $N_1P_1K_1$ without Fe spraying can be advised for flower earliness in Sweet peas.

2) Spraying Fe_2 (50 ppm ferrous citrate) increased the length of plants fertilized with $N_1P_0K_2$, high levels of phosphorus depressed the action of Fe_2.

3) The increased levels of phosphorus, potassium or both together had no remarkable effects on the length of plants.

4) In the abscence of P and K fertilizers, Fe_1 (25 ppm) sprays increased leaf area, also, the results indicated that leaf area expancion is probably dependant on a kind of balance between phosphorus and iron in plant tissue.

5) High levels of both P and K without iron sprays increased leaf area as well.

6) The width of the internode was responsive to iron sprays especially with Sweet peas fertilized with ($N_1P_0K_1Fe_2$) and ($N_1P_2K_2Fe_1$) .

7) Fertilization with the high levels of P combined with the application of Fe_2 increased the length of the 15th internode of Sweet peas.

8) In abscence of P and the presence of high level of K, iron sprays as Fe_2 increased the leaf number, however high level of P and K without Fe application was very responsive on increasing leaf number.

9) There were significantly increases with ($N_1P_0K_0Fe_2$) in the fresh weight of plant compared the control.

10) Iron in the highest level combined with high level in both P and K gave highly significant increase in the fresh weight of plant.

11) Spraying Sweet peas with Fe and using the high level of P and without K increased the flowers yield.

12) Addition of P as P_1 in the combination($N_1P_1K_0Fe_0$) was the best treatment for tallest peduncle length.

13) The combination ($N_1P_1K_0Fe_0$) was the only combination which considerably increased the dry weight percentage in the leaves of Sweet peas.

14) The addition of N, P, K and Fe sprays had no influence on N percentage in leaves.

15) The highest percentage of P in leaves was attained with ($N_1P_1K_0Fe_1$) and ($N_1P_2K_2Fe_1$).

16) No obvious variation in potassium percentage due to increasing the levels of P or K in the different combinations when Fe was not applied.

17) Iron has a relationship with chlorophyll content in the leaves, the most promissing effects of Fe was with the treatment ($N_1P_1K_1$), this was true in both seasons.

18) The total carbohydrate percentage were increased when the highest levels of P and K were used combined with the two levels of iron.

19) In both seasons, reducing sugars increased over the control with the applications of the level of iron, while the non reducing sugars increased when the high level of iron was used.

20) Potassium especially at the high level improved total carbohydrate, total soluble sugars, reducing sugars percentages, and this was more clear with spraying iron at the low level than the high one.

21) Increasing the level of P_0 to P_1 in the combination ($N_1P_1K_0Fe_0$) slightly increased the concrete oil percentage.

22) Potassium addition in ($N_1P_0K_1Fe_0$) increased the concrete oil percentage it was the most important element in increasing concrete oil.

23) The application of iron sprays with an adequate level of fertilization could remarkably increase the concrete oil percentage.

b) Pot Experiment:

1- Increasing the number of iron application regardless of plant age increased plant height.

2- Fe applications in early stage of growth were better than the application of iron few weeks after germination.

3- Six applications at flowering stage gave significantly more fresh weight as compared with control and six applications at the juvenile stage.

4- The most increase in the fresh weight of leaves and stem were with iron applications for 30 weeks. in sand culture.

5- Any experimental application of Fe increased the length of roots especially with 6 applications at flowering stage and 24 weeks applications starting after germination.

6- The most increase in the fresh weight of roots was observed in plant which received Fe as 30 applications .

7- Six applications starting the flowering period, also with the applications few weeks after germination (JF) and the best treatment was that of 30 weeks.

8- Significant relationship between the number

of iron applications and the increase in the weight of flowers per plant.

Trailing experiment:

1- Both methods of using network significantly surpassed the normal way of growing Sweet peas . However, it seemed that with growing Sweet peas on the non-galvanized wire benefited the plants to obtain iron through tendrils.

2- The length of the internodes of the plants supported with non-galvanized wire probably increased due to iron absorbed in same manner.

3- The non-galvanized gave the best width internodes as compared to control or polyethlene.

4- The wire network produced the greatest weights of plant as compared with control or polyethlene network in both seasons.

5- The non-galvanized wire significantly influenced the number of flowers per plant. In both seasons, the increases, in flower number, on control or polyethlene network were highly significant.

6- The non-galvanized network used in supporting, significantly produced more fresh weight of flowers per plant compared with those of normal method or with that of polyethlene network.

7- The dry weight percentage of cut flowers showed similar trends to those of fresh weights.

8- The longest flowers were those from the plants climbed on non-galvanized network followed by the polyethlene the shortest flowers were those from control plants.

9- From the economical point of view, using non-galvanized network is cheaper in the long run for the production of earlier and better crop of Sweet pea flowers.