

SUMMARY AND CONCLUSION

The present thesis aimed to study the effect of sowing dates, spraying pea plants (*Pisum sativum* L.) cv. Master B with growth regulators, Benzyl adenine and uniconazole and vernalization of seeds before sowing on vegetative growth, flowering and yield components the experiments were carried out at the experimental station of Faculty of Agriculture, Moshtohor, Zagazig University during the two successive seasons of 1997/1998 and 1998/1999. Three dates of sowing were selected i.e September 1st and 15th and October 1st. Growth regulators BA. or uniconazole were sprayed twice at the rate of 10 , 20 and 30 mg/L. Vernalization of seeds before sowing was carried at three temperatures 2, 5 and 10°C . Two experiment were run, the first was to study the effect of sowing date and foliar spray with growth regulators and their interaction on vegetative growth, photosynthetic pigments, chemical composition of plant foliage as well as quantity and quality of yield. The second one was achieved to study the effect of sowing date and vernalization of seeds before sowing and their interaction on germination, vegetative growth, endogenous hormones, photosynthetic pigments chemical composition of plant foliage and quantity and quality of yield .

Results obtained from the present study are summarized in the following items:

The first experiment:

Effect of sowing date and some growth regulators on vegetative growths, chemical composition and yield:

1-1 Data show that the delay of sowing date from September 1st to October 1st increased values of vegetative growth parameters expressed as plant length, number of leaves and branches as well as fresh and dry weight of plant during the two seasons of growth.

1-2 Spraying plants with BA at concentrations of 10, 20 or 30 mg/l or uniconazole at the rate of 10 mg/l, increased the number of leaves, branches, fresh and dry weight of plant .

1-3 Interaction of sowing date and the given concentrations of BA increased all the previous parameters, However uniconazole increased only the number of leaves and branches .

2-1 Available results show that photosynthetic pigments in leaves (chl. a , chl. b and carotenoids) and total carbohydrate, of plant foliage increased by delaying of sowing date to October 1st .

2-2 Application of either BA or uniconazole at all used concentrations increased photosynthetic pigments as well as total carbohydrates. These parameters increased proportionally to the concentration used.

2-3 Interaction of the two studied resulted in different studied factors parameters, and the highest values were obtained by 30 mg/l BA or uniconazole at the late sowing date October 1st .

3-1 Protein content as well as total N. phosphorus and potassium content of pea plant foliage increased gradually by delaying sowing date.

3-2 BA and uniconazole increased proteins, total N , P and K especially at the highest concentrations used (20, 30 mg/l)

3-3 Interaction of sowing date and growth regulators confirmed the previous trend of the two factors. The highest values were obtained by 20, 30 mg/l B A or uniconazole at the October 1st .

4-1 Late sowing date October 1st increased number of flowers per plant and the percentage of fruit setting .

4-2 B A and uniconazole increased number of flowers and fruit sewing.

4-3 Interaction of the two factors showed that late planting and spraying with 20 and 30 mg/L BA or 10 mg/L uniconazole recorded the highest number of flowers.

5-1 Sowing date at October 1st produced the highest values for yield components expressed by number and weight of green pods per plant and the weight of 100 green seed.

5-2 BA or uniconazole increased the total pod yield and their components . The highest values were obtained by 20, 30 mg/L B A or 10 mg/L uniconazole .

5-3 Interaction of sowing dates and growth regulators showed high values of yield resulted from plants sprayed with 20, 30 mg/L BA or 10 mg/L uniconazole at the October 1st .

6-1 Delaying the sowing date from September 1st to October 1st increased gradually total N, P, K and proteins and total carbohydrates content of produced seeds.

6-2 Both of BA and uniconazole, increased total N, P and K , proteins and total carbohydrates content of produced seeds specially when the highest concentration (30 mg/L) was used.

6-3 The interaction of sowing date and BA or uniconazole followed the same trend of each factor with respect to the studied seeds content.

The second experiment:

Effect of sowing date and seed vernalization on vegetative growths, chemical composition and yield

7-1 Obtained results clearly show that delaying sowing date from September 1st to October 1st increased germination percentage as well as vegetative growth expressed as plant length, number of leaves and branches as well as fresh and weight of plant foliage during both seasons of growth.

7-2 sowing of vernalized seeds at 2, 5 and 10°C increased germination percentage as well as all studied vegetative growth parameter. Seeds keeping 10°C for one day showed the marked effect.

7-3 Interaction of sowing date and seed vernalization reflected the previous trend of the two factors. Seed Treatment with 10°C October 1st showed the highest values of all studied parameters

8-1 Delaying sowing date from September 1st to October 1st increased endogenous IAA and Cytokinins .

8-2 Sowing vernalized seeds increased IAA and Cytokinins content of plant foliage .Treatment of 10°C was the most effective one.

8-3 Interaction effect of sowing date and seed vernalization increased IAA and Cytokinins content .The superior effect of late sowing date (October 1st) was attained by 10°C treatment . ABA increased by 5 and 10°C treatments September 1st and 15th and October 1st comparing with untreated ones.

9-1 Sowing dates showed that photosynthetic pigments in leaves and

total carbohydrate content of plant foliage increased as sowing date delayed from September 1st to October 1st.

9-2 Sowing vernalized seeds at all temperatures used (2, 5 and 10°C) increased photosynthetic pigments as well as total carbohydrates content. The superior effects were attained by the 10°C treatment.

9-3 Interaction effect of sowing dates and seed vernalization showed that the highest values of photosynthetic pigments and total carbohydrate were obtained by treatment the seeds with 10°C for 24 hours at the late sowing date (October 1st).

10-1 Proteins, total nitrogen, phosphorus and potassium content was increased in pea plant foliage by delaying the sowing date from the September 1st to October 1st.

10-2 Sowing vernalized seeds at 2, 5 and 10°C increased protein total N, P and K content the treatment 10°C showed the highest values for the previous plant content.

10-3 Interaction of sowing date and seed vernalization reflected the trend of each factor with regard to proteins, total N, P and K content. The highest levels were attained by seed treating with 10°C at the late sowing date October 1st.

11-1 Delaying sowing date from September 1st to October 1st increased the number of days from seed sowing to anthesis of the

first flower, number of flowers per plant and percentage of fruit setting

11-2 Sowing of vernalized seeds decreased days from seed sowing to anthesis of the first flower per plant and increased percentage of fruit setting. Treatment with 10°C showed the highest values.

11-3 Interaction effect of the two studied factors showed an increase in the pervious parameters .

12-1 Results recorded for yield showed that delaying sowing date from September 1st to October 1st gradually increased the total green pod yield and its components represented by number and total weight of pods per plant and weight of 100 seeds.

12-2 vernalization of seeds at 2, 5 and 10°C before sowing showed an increase in all previous yield parameters and the highest values were obtained by treatment of seeds with 10 C before sowing .

12-3 Interaction effect of sowing date and vernalization treatments showed that delaying sowing date to the October 1st favored yield increments and 10°C was the more effective treatment .

13-1 Delaying sowing date from the September 1st to October 1st increased total N. P. K protein and total carbohydrates of the produced seeds .

13-2 Sowing vernalized seeds at 2, 5, 10°C increased the previous macro elements as well as proteins and carbohydrates content of the produced seeds.

13-3 Interaction of sowing dates and vernalization temperature reflected the previous trends of the two factors with respect to the shudied macro elements, N. P. K as well as protein and total carbohydrate content of the produced seeds .Treatment with 10 °C at the 1st of October showed the highest values of all studied parameters.