Physiological studies on the role of some growth substances for early production of pea

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SUMMARY AND CONCLUSIONThe present thesis aimed to study the effect of sowing dates,spraying pea plants (Pisum sativuml.) cv. Master B with growthregulators, Benzyl adenine and uniconazole and vernalization of seedsbefore sowing on vegatative growth, flowering and yield components theexperiments were carried out at the experimental station of Faculty ofAgriculture, Moshtohor, Zagazig University during the two successiveseasons of 1997/1998 and 1998/1999. Three dates of sowingwere selected i.e September 1st and 15th and October 1st. Growthregulators BA. or uniconazole were sprayed twice at the rate of 10 , 20and 30 mg/L. Vernalization of seeds before sowing was carried at threetemperatures 2, 5 and IDOC. Two experiment were run, the first was tostudy the effect of sowing date and folair spray with growth regulatorsand their interaction on vegetative growth, photosynthetic pigments,chemical composition of plant foliage as well as quantity and quality ofyield. The second one was achieved to study the effect of sowing dateand vernalization of seeds before sowing andtheir interaction on germination, vegetative growth, endogenoushormones, photosynthetic pigments chemical composition of plantfoliage and quantity and quality of yield.Results obtained from the present study are summarized m thefollowing items:The first experiment:I-I Data show that the delay of sowing date from September Ist toOctober 1st increased values of vegetative growth parameters expressedas plant length, number of leaves and branches as well as fresh and dryweight of plant during the two seasons of growth.1-2 Spraying plants with BA at concentrations of 10,20 or 30 mgll oruniconazole 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 SAincreased all the previous parameters, However uniconazole increasedonly the number of leaves and branches .2-1 Available results show that photosynthetic pigments in leaves(chl. a , chl. band carotenoids) and total carbohydrate. of plant foliageincreased by delaying of sowing date to October 1st •2-2 Application of either BA or uniconazole at all used concentrationsincreased photosynthetic pigments as well as total carbohydrates. Theseparameters increased proportionally to the concentration used.2-3 Interaction of the two studied resulted in different studiedfactors parameters, and the highest values were obtained by 30 mg/l BAor uniconazole at the late sowing date October 1st •3-1 Protein content as well as total N. phosphorus and potassium contentof pea plant foliage increased gradually by delaying sowing date.3-2 BA and uniconazole increased proteins, total N , P and K especiallyat the highest concentrations used (20,30 mg/l)3-3 Interaction of sowing date and growth regulators confirmed theprevious trend of the two factors. The highest values were obtained by20, 30 mg/l B A or uniconazole at the October 1st •4-1 Late sowing date October Isl increased number of flowers per plantand 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 andspraying with 20 and 30 mg/L BA or 10 mg/L uniconazole recorded thehighest number of flowers.5-1 Sowing date at October 1st produced the highest values for yieldcomponents expressed by number and weight of green pods per plant andthe weight of 100 green seed.5-2 BA or uniconazole increased the total pod yield and theircomponents . The highest values were obtained by 20, 30 mg/L B A or10 mg/L uniconazole .5-3 Tnteraction of sowing dates and growth regulators showed highvalues of yield resulted from plants sprayed with 20, 30 mg/L BA or 10mg/L uniconazole at the October 1st •6-1 Delaying the sowing date from September 1st to

October 1stincreased gradually total N, P, K and proteins and total carbohydratescontent of produced seeds.6-2 Both of BA and uniconazole, increased total N, P and K , proteinsand total carbohydrates content of produced seeds specially when thehighest concentration (30 mg/L) was used.6-3 The interaction of sowing date and BA or uniconazole followed thesame trend of each factor with respect to the studied seeds content.The second experiment:Effect of sowing date and seed vernalization on vegetativegrowths,chemical composition and yield7-1 Obtained results clearly show that delaying sowing date fromSeptember 15t October 15t increased germination percentage as well asvegetative growth expressed as plant length, number of leaves andbranches as well as fresh and weight of plant foliage during both seasonsof growth.7-2 sowing of vernalized seeds at 2, 5 and 1DoCincreased germinationpercentage as well as all studied vegetative growth parameter. Seedskeeping 10°C for one day showed the marked effect.7~3 Interaction of sowing date and seed vernalization reflected theprevious trend of the two factors. Seed Treatment with 10°C October 15tshowed the highest values of all studied parameters8-1 Delaying sowing date from September 15t to October 15t increasedendogenous IAA and Cytokinins .8-2 Sowing vernalized seeds increased IAA and Cytokinins content ofplant foliage .Treatment of lO°C was the most effective one.8-3 Interaction effect of sowing date and seed vernalization increasedIAA and Cytokinins content .The superior effect of late sowing date(October 15t) was attained by IO°C treatment. ABA increased by 5 and100C treatments September 15t and is" and October 15l comparing withuntreated ones.9-1 Sowing dates showed that photosynthetic pigments in leaves andtotal carbohydrate content of plant foliag increased as sowing datedelayed from September 15t October 15t .9-2 Sowing vernalized seeds at all temperatures used (2, 5 and 1DOC)increased photosynthetic pigments as well as total carbohydrates content.The superior effects were attained by the 1O°Ctreatment.9-3 Interaction effect of sowing dates and seed vernalization showed thatthe highest values of photosynthetic pigments and total carbohydratewere obtained by treatment the seeds with lO°C for 24 hours at the latesowing date (October 151).10-1 Proteins, total nitrogen, phosphorus and potassium content wasincreased in pea plant foliage by delaying the sowing date from theSeptember 151 to October 151•10-2 Sowing vernalized seeds at 2, 5 and lOoCincreased protein total N.P and K content the treatment 1O°Cshowed the highest values for theprevious plant content.10-3 Interaction of sowing date and seed vernalization reflected the trendof each factor with regard to proteins, total N. P and K content. Thehighest levels were attained by seed treating with lOoCat the late sowingdate October 151•11-1 Delaying sowing date from September 151 to October 15t increasedthe number of days from seed sowing to anthesis of thefirst flower, number of flowers per plant and percentage of fruit setting1t -2 Sowing of vernalized seeds decreased days from seed sowing toanthesis of the first flower per plant and increased percentage of fruitsetting .Treatment with lOoCshowed the highest values.11-3 Interaction effect of the two studied factors showed an increase inthe pervious parameters.12-1 Results recorded for yield showed that delaying sowing date fromSeptember 1st to October I st gradually increased the total green pod yieldand its components represented by number and total weight of pods perplant and weight of 100seeds.12-2 vernalization of seeds at 2, 5 and I O°co before sowing showed anincrease in all previous yield parameters and the highest values wereobtained by treatment of seeds with 10C before sowing.12-3 Interaction effect of sowing date and vernalization treatmentsshowed that delaying sowing date to the October 1st favored yieldincrements and 10°C was the more effective treatment.13-t Delaying sowing date from the September l " to October 1stincreased total N. P. K protein and total carbohydrates of the producedseeds.13-2 Sowing vernalized seeds at 2, 5, lOoCincreased the previousmacro elements as well as proteins and carbohydrates content of theproduced seeds.13-3 Interaction of sowing dates and vernalization temperature reflectedthe previous trends of the two factors with respect to the shudied macroelements, N. P. K as well as protein and total carbohydrate content of theproduced seeds .Treatment with 10°C at the 1st of October showed thehighest values of all studied parameters