position of egyptian clover in the crop rotation

Salah Hassan Abbas Allam

Four field experiments were carried out at the AgriculturalResearch and Experimental Station, Faculty ofAgriculture at Moshtohor, Zagazig Univ., during the twosuccessive seasons of 1982/83 and 1983/84.-rvgermination experiments were conducted in a pot trial inthe same seasons. The aim of this study was to investigatethe effect of gamma irradiation and some growth regulatorson growth, yield and chemical content of fenugreek(Trigonella foenum gracum L.) var. Giza 30.The soil of the experiments was loam clay in texturehaving a pH value 7.85 and organic matter content of 2.5%.A. The first study :Two germination experiment were conductedin a pot trail during the two growing seasons. Eachexperiment included five seed treatments of gamma irradiationdoses, i.e. 0, 1, 2, 4 and 8 K. rad. The design ofthe experiment was randomize complete block with four replications.Results could be summarized as follows1. In 1982/83 season, irradiation of seeds with gamma rayshad no significant effect on germination percentage. Onthe other hand, irradiation of seeds with 1, 4 and 8 K.rad trended to greater increase in this character in thesecond season.2. Irradiation had no significant effect of germinationrate index in the two successive seasons3. The irradiation of seeds with gamma rays doses of 1, 2,4 and 8 K. rad induced significantly reduction in rootlength of seedling less than the unirradiated seeds inthe first season only.4. Seedling height increased significantly as the gammadoses increased up to 8 K. rad. On the other hand, numberof leaves/seedling significantly decreased by increasinggamma irradiation doses in the first season only.5. Dry weight/seedling increased as the gamma doses increasedup to 1 K. rad in the two successive seasons.D The second study :Two field experiments were conducted, 9each included 15 treatments which were the combinations offive gamma ray doses 0, 1, 2, 4 and 8 K. rad) and three IAAtreatments (0, 20 and 40 ppm) or three GA3 treatments (0,100 and 200 ppm). The treatments were arranged in a randomizedcomplete block design.Results could be summarized as follows1. Effect of gamma irradiation and IAA :1. Lower radiation doses (lor 2 K. rad) have significantstimulating effect on plant height as well as dry weightper plant, whereas higher doses (4 and 8 K.rad) inhibitedfengreek growth characters.At harvesting stage (160 days from sowing), number ofbranches/plant, number of pods/plant and seed yield/fad.significantly decreased as the gamma rays doses increasedup to 8 K. rad.- 123 -Lower doses of gamma 1 or 2 K. rad increased seed yieldper plant and higher doses decreased weight of seed/plantin the two seasons.oGamma rays had no significant effect on/biolgoical yield/fad. and chemical content of fenugreek seeds in the bothseasons.2. Effect of IAA on growth characters of fenugreek showedseasonal variation. Application of 20 or 40 ppm wasmore effective on plant height and dry weight/plant, respectivelyin the first season only.Number of pods/plant and weight of seeds/plant decreasedas the IAA increased up to 40 ppm in one season,only. On the other hand, application of 40 ppm significantlyincreased seed yield/fad., N-content as wellas Na-content in seeds over the untreated plants.IAA had no significant effect on the number of podsper plant, 100-seed weight, biological yield/fad., oil(%) , K-content and P-content in seeds.3. Effect of the interaction between gamma rays and IAAshowed significant effect on dry weight/plant, 100-seed weight, seed yield/fad., biological yield/fad.,protein (%), oil (%), Na-content, K-content and Pcontent.II. Effect of gamma irradiation and GA3;1. Plant height, dry weight/plant, number of branches perplant, number of pods/plant, lOa-seed weight, yield ofseeds/plant tended to be decreased by exposing seeds toirradiation up to 4 and 8 K. rad in the both seasons.The highest seed yield was obtained at 2 K. rad dosewhereas, higher doses, i.e. 4 and 8 K. rad significantlyreduced the seed yield/fad. in the second season only.On the

other hand, gamma ray doses had no significanteffect biological yield/fad. and chemical analysis forseeds in the both seasons.2. Number of branches/plant and number of pods/plant significantlyincreased by foliar application of GA 3ppm). On the other hand, the number of branches/plant,weight of lOa-seed and oil (2) decreased by increasingGA up to 200 ppm. 3Increasing GA3 up to 100 or 200 ppm significantlyincreased weight of seeds/plant than the untreated plantsin one season only.The effect of GA 3 on seed yield/fad. showed no part iculartrend could be detected in the two seasons. Thehighest yields of seed as well as biological was obtainedfrom untreated plants with GA3 and from 200 ppmGA3 in the first and second seasons, respectively.On the other hand, GA had no significant effect on 3plant height, dry weight/plant as well as chemical analysisfor fenugreek seeds.3. Gamma ray doses x GA had significant effect on dry 3weight/plant, weight of 100-seed, weight of seeds/plantseed yield/fad, biological yield/fad., Na-content, Pcontentand K-content of seeds.c The third study : Two experiments were conducted, eachincluded 12 treatments which were the combinations of threeconcentrations of IAA or GA and four repetations of spray- 3ing (1, 2, 3 and 4 times). The design of the experimentswas radomize complete block.Results could be summarized as follows1. Increasing number of spraying decreased the dry weight/plant and weight of 100-seed. Spraying plants once timeby IAA or GA3 produced higher dry weight in the firstseason. On the other hand, increasing spraying numberto 3 times with IAA and 4 times with GA significantly 3increased the number of branches, number of pods/plant,weight of seed/plant and seed yield/fad. in one seasononly. whereas, spraying number showed no significanteffect on plant height and biological yield/fad.2. Dry weight/plant, number of branches/plant, N-content,A~ ”land K-content significantly increased with increasingconcentrations of IAA up to 40 ppm. On the contrary,increasing concentration of IAA significantly decreasedthe number of pods/plant. While, plant height, weightof 100-seed, weight of seed/plant, seed yield/fad. andbiological yield/fad. was not significantly affectedwith IAA.Plant height, dry weight, number of branches/plant,number of pods/plant, weight of 100-seed and K-contentsignificantly incluased with increasing the GA 3 at higherconcentrations. whereas, application of GA3 had no significanteffect on weight of seeds/plant, and seed yield/faddan.3. Effect of the interaction was significant on dry weight,plant, number of branches/plant, weight of 100-seed andweight of seed/plant.