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THE ROLE OF IRRIGATION INTERVALS AND NITROGEN FERTILIZER IN INCREASING FABA BEAN PRODUCTIVITY UNDER EGYPTIAN CONDITIONS.

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ABSTRACT: Two field experiments, were conducted at Agricultural Research Farm. Agronomy Department, Faculty of Agriculture, AL-Azhar univ. Madenit Nasser during 2007/2008and2008/2009 seasons to study the influence of irrigation intervals (4,8and12days)and nitrogen fertilizer at the rate of 20,30and 40 kg/fad. as compost , as well as biofertilizer as Nitrobein 500 and 750 g /fad. on the yield components and seed chemical contents of faba bean Miserl variety. The results revealed that irrigation every 4 days awarded the highest significant means for no. of pods /plant, straw yield /fad., seed yield /fad. and seed index . Seed Protein and carbohydrate percentages followed the same irrigation trend mean while, irrigation every 12 days gave the highest average for harvest index , in both growing seasons. The highest means of the above yield parameters attributed to 40 kg N/fad. as compost. Nitrobein as biofertilizer treatment at the rate of 750 g/fad. was the most effective one on the above traits. Most of the first and second order interactions had significant effect on the studied parameters. Generally, irrigation faba bean plants every 4 days with the application of 40 kg N/fad. in the presence of Nitrobein (500 or 750 g/fad.) gave the best results for the most characters under study.

INTRODUCTION

Many of undeveloped countries in Africa and Essia depend on legumes as an important source for proteins ,vitamins and minerals . The legume crops such as faba bean, soybean and mung bean as a poor source of nutration can replace partly the rich source or the animal nutrition source.

In Egypt, cooked or faba bean is considered the main plate on breakfast table for a large Egyptian consumers , therefore increasing the productivity of such crop was under the focus for many recreachs with

enhancing also the cultivated area up to170106 fad. as recorded by the Economic Affairs Sector, Ministry of Agriculture,(2008),A.R.E.

In addition to the important role of faba bean for human been nutration, it had, also, important role in soil fertility by enhancing nitrogen role, through root nodules and nitrogen fixing bacteria. Irrigation intervals through the new irrigation system i.e. splinker irrigation is one of the limited factor which contributes in enhancing crops productivity, especially in sandy soil. EL-Warraky (1978), on lentil reported that plant height, number of pods and seeds/ plant, straw and seed yield/fad. were significantly increased with increasing irrigation frequency.

Abd-El–Gawad et al. (1983), postulated that exposing faba bean plants to irrigate every 14 days caused significant increase in seed, straw and biological yields, number and weight of pods and seeds/plant, as well as seed index. On the other hand, using biofertilizer and compost is considered as a mean for improving the soil chemical, structure and mechanical, as well as increasing the growth and yield of the crop. Acton and Gregorich(1995),pointed out that addition of compost to the soil improves the physical, chemical and biological properties of soil and plant ability to utilize fertilizer application. Organic matter improves the aeration for roots and microbes, as well as water holding capacity which functionally reduces water requirements for plants. Added to that, organic matter increases the soils cation exchange capacity and humic acid content which aids in making plant nutrient available. Burgos et al (2001), found that organic fertilization increased the Kjeldahal-N and available P content of soil, the favorable effect on soil fertility was more noticeable under the reduced irrigation regime. With regard to using biofertilizer treatment, especially nitrobein as a source of nitrogen fertilizer. Singh and Lawanaya (2002), cleared that biofertilizers are less expensive, ecofriendly , preparation containing live or latent cells of efficient nitrogen fixing, phosphate solubilzing organisms used for improving the grain yield and soil texture for long-term sustainable agriculture. Pandey and Kumar (1989) published that the beneficial effects of biofertilizer i.e. Azotobacter and Azospirillum are related not only to their N-fixing proficiency but also with their ability to produce antibacterial and antifungal compounds , growth regulators and siderophores. The objective of this investigation is to study the influence of irrigation intervals and the organic nitrogen sources (compost and biofertilizer) on yield,- yield attributes and chemical contents of *Vicia faba* seeds.

MATERIALS AND METHODS

In Agricultural Research Farm, Agronomy Department, Faculty of Agriculture, AL-Azhar University, Madent Nasser, two field experiments were conducted to detect the influence of irrigation intervals ,organic nitrogen as compost and Nitrobien as biofertilizer, on the growth, yield and yield components and some seed chemical contents of Miser 1cv faba bean, during the two growing seasons 2007/2008and 2008/2009.

Experimental treatments :

A-Irrigation intervals:

This experiment included three irrigation intervals as follows:-

1. Irrigation every 4 days.
2. Irrigation every 8 days.
3. Irrigation every 12 days.

Table (1) Number of irrigation and the amount of added water for each irrigation (m^3/fad.)fixed sprinkler irrigation system was used.

Irrigation intervals day	Number of Irrigation	Amount of added water m^3/fad.
4	38	2908
8	19	1654
12	13	1258

B-Nitrogen fertilizer:

Two sources of nitrogen fertilizer had been used as follow:-

1-Organic N as compost:

Nitrogen was added in the form of compost to the soil at three rates as follow:

A- 20Kg N/fad.

B-30Kg N/fad.

C-40Kg N/fad.

These studied rates were determined according to nitrogen content in the tested compost.

2-Nitrogen biofertilizer as Nitrobein:

Three doses were used from Nitrobein as follow :

A-Without any addition of Nitrobein.(0.00g)

B-The addition of 500 g Nitrobein/fad.

C- The addition of 750 g Nitrbein /fad.

Nitrobein was mixed with the seeds of the expenimental variety before sowing .A split – split plot design with three replications was used. The main plots were devoted to irrigation intervals, the sub plots were assigned to organic nitrogen ferlitizer (compost), while nitrogen biofertilizer (nitrobein) occupied the sub-subplots. This experiment consisted of 27treatments,which were the combinations of 3 irrigation intervals,3 rates of organic nitrogen fertilizer and 3 doses of nitrogen biofertilizer. The experimental plot area was $10m^2$ (4x2.5m), there were four ridges in each plot spaced 60cm.The soil was plowed and flatted to provide a satisfactory bed for planting. Calcium super phosphate (15.5%P2O5)was applied during land preparation at the rate of 100kg./fad., soil samples were collected to depth of 0-30 cm. before sowing for mechanical and chemical analysis(A.O.A.C.1970),results are presented in Table(2). Whereas, the nitrogen in the used compost was estimated in Table (3).

Table(2) Chemical and mechanical analysis of the soil at experimental site

Season	pH	N	P	K	Zn	Fe	Ec	Sand %	Silt %	Clay %
		mg/kg. soil	mg/kg. soil	mg/kg. soil	mg/kg. soil	mg/kg. soil	Mm /cm			
2007	7.80	0.96	0.10	0.296	0.6	7.60	1.6	60 .4	8.0	31.6
2008	7.50	0.98	0.91	0.298	0.43	7.80	1.5	58. 6	7.95	33.45

Table(3) the nitrogen percentage in the used compost in 2007and 2008 seasons.

Season	2007	2008
N	1.12	1.1
C/N	14.15/1	14.40/1

The studied characters:

A-Yield and yield components:-

At harvest stage, all the plants in each plot were harvested to estimate the following parameters :

1-Number of pods/plant.

2- Seed index ,weight of 100 seed (g)

3-Seed yield /fad.(ardab)

4- Straw yield /fad. (ton)

5-Harvest index (%), it was determined according to this equation.

$$\text{Harvest index} = \frac{\textit{Economic yield}}{\text{Biological yield}} \times 100$$

B-Chemical characters:

1-Seed protein percentage :Nitrogen was determined using the improved kjeldahps methods of the A.O.A.C.(1970) modified by distilling the ammonia into boric acid. Protein percentage was calculated by multiplying the nitrogen in the seed by 6.25 for faba bean.

2-Seed carbohydrate percentage:

The total carbohydrates were determined using the colorimetric analysis described by Herbert et. al.(1971)

Statistical analysis:

The analysis of variance was used for this experiment according to Snedecor and Cochran (1981), the least significant difference (L.S.D) test at 5% level of significant was used to indicate treatment differences.

RESULTS AND DISCUSSION

1. Yield and yield components:

Results in Table (4) reveal significant effect of irrigation intervals on number of pods/plant through 2007/2008 and 2008/2009 seasons. It was noticed that, irrigation every 4and 8days achieved significant increase for no. of pods/plant, in both successive seasons as compared with irrigation every 12 days. For example, irrigated faba bean every 12 day decreased that studied number pods/plant by 32.67% in the first season and by 45.89% in the second one, as enduring with irrigation every 4 days. These results may be ought to, exposing faba bean plants to water stress, during vegetative growth , flowering and pod set during seed filling, yield and vegetative weight of the plants were drastically reduced, as lay opened by Egli et al.(1983). Different rates of organic nitrogen had significant influence on the above studied character in both successive seasons. Increasing nitrogen fertilizer rate from 20 up to 40 kg N/fad. enhanced number of pods/plant from 13.33 up to 18.41 in the first season and from 13.21 till to 15.62 in the second one. These results are in harmony with those obtained by Shaaban and Okasha (2007), they showed that soil conditioning with the used compost positively affect on broad bean plants growth production and consequently water and fertilizers use efficiency being higher with the application rate of the compost. Nitrobein as biofertilizer had also significant impact on number of pods/plant, in both seasons. Mixing faba bean seeds with 500 or 750 g/fad. nitrobein enhanced that number to become 17.15 and 15.38 as compared with 0.00 Nitrobein (13.90), in the first season. Same trend had been observed in the second one. From these results, it could be concluded that, inoculation of legume seeds at planting is generally recommended to maximize the potential of nodulation and N2 fixation in these crops. Most of the first and second order interactions had significant impact on that studied characters, through the two successive seasons. For example significant increase had been detected for number of pods/plant due to the (AxC) interaction, in both seasons. Irrigation every 4 days with adding 750g/fad. of nitrobein awarded the highest number of pods (19.37), in the first season and (20.22) in the second one. In the second growing season, only, the number of pods/plants was significantly affected by the second order interaction (AxBxC). Irrigated faba bean plants every 4 days with adding 40 kg N/fad. as compost under the

Table(4)The effect of irrigation intervals, organic nitrogen fertilizer and Nitrobein on number of pods/ plant for faba bean in 2007/2008and 2008/2009 seasons.

Irrigation intervals (A) days	nitrogen fertilizer Compost (B) kg/fad.	Number of pods/ plant							
		2007 season			Mean	2008 season			Mean
		Nitrobein (C) g/fad.				Nitrobein (C) g/fad.			
		0.00g/fad.	500g/fad.	750g/fa.		0.00g/fd.	500g/fa.	750g/fad.	
4	20	13.533	15.633	15.400	14.856	15.000	17.333	18.267	16.867
	30	13.367	16.700	20.033	16.700	16.167	18.400	20.533	18.367
	40	18.200	21.200	22.700	20.700	18.433	20.867	21.867	20.211
	Mean	15.033	17.844	19.378	17.419	16.533	18.689	20.222	18.481
8	20	13.217	15.833	16.717	15.256	12.900	13.167	14.467	13.511
	30	14.700	18.267	20.457	17.808	14.500	14.567	15.333	14.800
	40	19.650	20.457	21.517	20.541	15.400	15.633	16.400	15.811
	Mean	15.856	18.186	19.563	17.868	14.267	14.456	15.400	14.707
12	20	8.667	10.367	10.633	9.889	8.600	9.367	9.800	9.256
	30	10.830	11.023	12.060	11.304	9.433	10.033	10.233	9.900
	40	13.020	14.070	14.873	13.988	10.400	10.633	11.500	10.844
	Mean	10.839	11.820	12.522	11.727	9.478	10.011	10.511	10.000
Mean of compost	20	11.806	13.944	14.250	13.333	12.167	13.289	14.178	13.211
	30	12.966	15.330	17.517	15.271	13.367	14.333	15.367	14.356
	40	16.956	18.576	19.697	18.410	14.744	15.533	16.589	15.622
Mean of Nitrobein		13.909	15.950	17.154		13.426	14.385	15.378	
LSD at 0.05for									
Irrigation(A)		1.33				0.164			
Compost (B)		0.379				0.571			
Nitrobein(C)		0.656				0.499			
AxB		N.S				N.S			
AxC		0.373				0.865			
BxC		0.646				0.865			
AxBxC		N.S				1.497			

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mixing seeds with 750 g of Nitrobein gave the highest number of pods/plant (21.86).

From Table (5) ,it was obvious that seed index (g) and seed yield/fad(ardab) were decreased substantially, in general, as increasing irrigation intervals from 4 up to 12 days. So, the maximum yield of seeds/plant attributed to irrigation every 4 days, the superiority of that studied interval outyielded by 64.02% in the first season and by 77.64% in the second one as enduring with irrigation every 12 days. Same trend had been observed for the relation between irrigation intervals and seed index, in both seasons. These results may be due to, during the flowering and pod set period, water stress exacerbation of the abortion in these organs. Water stress also produced reduction in the number of seeds per pod as illustrated by Martinz et al(2007). In both seasons, application of compost organic nitrogen significantly enhanced seed yield/fad. the rate of 40 kg N/fad., gave the maximum seed yield, 6.48 ardab/fad. in the first season and 6.41 ardab/fad .,in the second one. In general seed yield/fad was increased as increasing the rate of N from 20 up to 40 kg/fad. Doshti et al (1997) ,explicated the role of organic wastes on the productivity of the crops, they indicated that organic wastes are considered the main sources to meet the nutrient requirements of crops. Furthermore ,use the micro organisms can either fix atmospheric nitrogen or stimulate of growth promoting substances. Significant effect for Nitrobein on seed yield and seed index were observed ,in both successive seasons, as shown in Table (5).Mixing faba bean seeds with nitrobein at the rate of 750 g/fad. increased markedly seed yield/fad. by 3.82% in the first season and by 13.10% in the second one, as compared with untreated seeds(0.00gNitrobein). The promotive effect of bio fertilizer may be ought to these types of fertilizers increased both number of nodules and the dry weight of nodules/plant, which had positive effect on legume plant growth ,yield and soil fertility, as reported by Hussein et al (1999). Mean while, Nitrobein had an erratic effect on seed index through 2007/2008 and 2008/2009 seasons. From Table (5)it was cleared that, most of the first and second order interactions had ambivalence effects on seed yield/fad. and seed index , during the two successive seasons. For example the effect of (AxC) interaction was significant on seed yield/fad., in both growing seasons. But seed index was significantly affected only in the first season by this interaction. In general, the greatest weight of seed yield (8.374 ardab/fad.) associated with irrigation every 4 days in the presence of 750 g nitrobein /fad., in the first season. Similar results had

Table(5)The effect of irrigation intervals , organic nitrogen fertilizer and Nitrobein on seed index (g) and seed yield/fad. (ardab) for faba bean in 2007/2008and 2008/2009 seasons.

Irrigation intervals (A) days	Compost nitrogen fertilizer kg/fad.	Seed index(g)								Seed yield/a (ardab)							
		2007 season			Mean	2008 season			Mean	2007 season			Mean	2008 season			Mean
		Nitrobein (C) g/fad.				Nitrobein (C) g/fad.				Nitrobein (C) g/fad.				Nitrobein (C) g/fad.			
		0.00	500	750		0.0 0	500	750		0.00	500	750		0.00	500	750	
4	20	82.917	85.493	88.137	85.516	100.417	103.680	93.657	99.251	6.540	7.027	8.367	7.311	6.167	6.733	7.433	6.778
	30	86.023	87.770	90.323	88.039	100.413	93.837	89.653	94.634	7.410	7.683	8.100	7.731	6.800	7.100	7.733	7.211
	40	85.847	87.823	92.060	88.577	90.240	87.173	93.707	90.373	7.420	6.613	8.657	7.563	7.400	7.433	8.333	7.722
	Mean	84.929	87.029	90.173	87.377	97.023	94.897	92.339	94.753	7.123	7.108	8.374	7.535	6.789	7.089	7.833	7.237
8	20	70.147	72.217	73.190	71.851	90.543	77.347	92.247	87.569	5.350	5.657	5.490	5.499	5.100	5.300	5.700	5.367
	30	73.113	74.813	76.650	74.859	83.547	86.913	92.247	87.569	4.463	6.403	6.083	6.317	6.367	6.800	7.167	6.778
	40	74.337	76.203	78.477	76.339	90.540	83.930	87.403	87.288	7.377	6.613	6.673	6.888	6.883	7.133	7.417	7.144
	Mean	72.532	74.411	76.106	74.350	88.210	82.727	91.148	87.361	6.397	6.224	6.082	6.234	6.117	6.411	6.761	6.237
12	20	61.180	63.493	66.633	63.769	93.833	87.373	87.553	89.587	4.357	4.517	4.097	4.323	3.617	3.733	4.200	3.850
	30	63.303	65.003	67.677	65.328	97.150	87.103	83.887	89.380	4.297	4.733	4.373	4.468	3.800	3.917	4.300	4.006
	40	64.620	66.503	68.507	66.543	90.487	83.880	83.897	86.088	5. 303	4.917	4.750	4.990	4.167	4.333	4.600	4.367
	Mean	63.034	65.000	67.606	65.213	93.828	86.119	85.112	88.351	4.652	4.722	4.407	4.594	3.861	3.994	4.367	4.074
Mean of compost	20	71.414	73.734	75.987	73712.	94.931	89.467	91.668	92.022	5.416	5.733	5.984	5.711	4.961	5.256	5.778	5.331
	30	74.147	75.862	78.217	76.075	93.703	89.284	88.596	90.528	6.056	6.273	6.186	5.711	4.961	5.256	5.778	5.998
	40	74.934	76.843	79.681	77.153	90.422	84.991	88.336	87.916	6.700	6.048	6.693	6.480	6.150	6.300	6.783	6.411
Mean of Nitrobein		73.499	75.480	77.961		93.019	87.914	89.533		6.589	6.018	6.288		5.589	5.831	6.320	
LSD at 0.05for																	
Irrigation(A)			0.715				5.539				0.206				0.124		
Compost (B)			N.S				N.S				0.263				0.073		
Nitrobein(C)			0.292				4.127				0.204				0.075		
AxB			N.S				N.S				0.455				0.127		
AxC			0.505				N.S				0.354				0.131		
BxC			N.S				N.S				0.354				N.S		
AxBxC			0.875				N.S				N.S				N.S		

been observed in the second one .As for seed index findings, the maximum weight of seeds (90.17 g) had been detected under the same circumstances of irrigation and biofertilizer. In the first season only, the second order interaction (AxBxC) had significant effect on seed index as tabulated in Table (5) .The heaviest seeds (92.06 g) was obtained from irrigated faba been plants every 4 days with the application of 40 kg N/fad as compost under the mixing of 750 g nitrobein /fad..

Straw yield /fad, was significantly decreased as increasing irrigation intervals from 4 up to 12 days. Therefore, irrigated faba bean plants every 4 days scored the highest yield of straw, 0.94 and 0.92 ton/fad. in the first and second season, respectively. It means that, straw yield /fad. outyielded by 42.67 % and by 65.80% in both seasons, respectively as compared with irrigation every 12 days, as shown in Table (6). Enhancing straw yield/fad. as irrigated faba bean plants every 4 days may be due to, soil water content in crops, active root zone and available water capacity are the key indicators for applying the right amount of irrigation at the right time as explicated by Klocke and Hergert (1990). Straw yield/fad. was aggrandized substantially as increasing the rates of nitrogen fertilizer. Straw yield/fad. that was obtained from adding 40 kg N/fad. outyielded by 11.76% in the first season and by 8.20% in the second growing one, as enduring with adding 20 kg N/fad. These results may be explicated by Lew and Owski (2002),they clarified that organic matter increases the nutrient holding capacity of soil, so it is a pool of nutrients for plants. Organic matter bind nutrients, preventing them from becoming permanently unavailable to plants. On the other hand, organic matter improves water infiltration , decreases evaporation and increases water holding capacity, all these positive cases may reflect on the growth and productivity of the plant.On the contrary , mixing faba been seeds with Nitrobein at the two studied rates decreased significantly straw yield/fad. by 7.95% in the first season as compared with untreated seeds. It is turn out to be that, using biofertilizer alone doesn't attained the goal and enhancing straw yield, but it had negative effect, as experiencing with untreated seeds that achieved the highest means of straw yield/fad., as shown in Table(4).While in the second season, straw yield/fad. took the same trend of number of pods/plants as affected by Nitrobein levels. In both seasons, (AxC) interaction had significant effect on that tested parameter. The maximum straw yield (0.944 and 0.957 ton/fad.) attributed to irrigation every 4 day and mixing the seeds with 750g Nitrobein/fad. The second order interaction(AxBxC)achieved the

Table(6)The effect of irrigation intervals , organic nitrogen fertilizer and Nitrobein on straw yield/fad (ton)for faba bean in 2007/2008and 2008/2009 seasons.

Irrigation intervals (A) days	nitrogen fertilizer Compost (B) kg/fad.	Straw yield/fad (ton)							
		2007 season			Mean	2008 season			Mean
		Nitrobein (C) g/fad.				Nitrobein (C) g/fad.			
		0.00	500	750		0. 00	500	750	
4	20	0.912	0.895	0.906	0.904	0.848	0.914	0.936	0.899
	30	0.944	0.947	0.935	0.942	0.904	0.944	0.940	0.929
	40	0.982	0.986	0.990	0.986	0.933	0.952	0.957	0.947
	Mean	0.946	0.943	0.944	0.944	0.895	0.936	0.944	0.925
8	20	0806	0.768	0.715	0.763	0.677	0.730	0.750	0.7191
	30	0.859	0.806	0.757	0.807	0.697	0.750	0.767	0.738
	40	0.888	0.843	0.799	0.843	0.741	0763	0.820	0.775
	Mean	0.851	0.806	0.757	0.804	0.705	0.748	0.779	0.744
12	20	0.383	0.352	0.313	0.350	0.290	0.327	0.345	0.321
	30	0.434	0.402	0.348	0.394	0.333	0.344	0.364	0.347
	40	0.468	0.422	0.378	0.423	0.360	0.370	0.97	0.376
	Mean	0.428	0.392	0.347	0.389	0.328	0.347	0.369	0.348
Mean of compost	20	0.700	0.672	0.645	0.672	0.605	0.657	0.677	0.646
	30	0.746	0.718	0.680	0.714	0.645	0.657	0.690	0.671
	40	0.779	0.750	0.723	0.751	0.678	0.695	0.724	0.699
Mean of Nitrobein		0.742	0.713	0.682		0.643	0.677	0.697	
LSD at 0.05for Irrigation(A) Compost (B) Nitrobein(C) AxB AxC BxC AxBxC		0.008 0.011 0.008 N.S 0.013 N.S N.S				0.015 0.009 0.007 0.016 0.012 N.S 0.012			

maximum weight of straw yield (0.957 ton/fad.) as irrigate every 4days under the application of 40 kg/fad. and mixing the seeds with 750g nitrobein/fad..

As for harvest index results, Table (7) reveals that ,in general ,it was increased significantly as increasing irrigation intervals from 4,8 up to 12 days , in both growing seasons. The results confirmed that harvest index values did not reduce as increasing irrigation intervals, that is due to physiological effects of drought on plants were the reduction in vegetative growth, particularly shoot growth, slower cell division due to reduce cyclindependent kinase activity, also reduced leaf expansion is beneficial to plants under water deficit , as less leaf area is expanded resulted in reduced transpiration, as layopened by Mahajan and Tuteja (2005).The addition of compost to the experimental site also enhanced significantly harvest index, in both seasons. Fertilizing faba bean plants with 40 kg N /fad. on the form of compost overyielded harvest index by 13.47% in the first season and by 20.26% in the second one, as enduring with 20kgN/fad., this increament may be due to the application of organic matter in presence a minimal level of mineral nitrogen led to high activity of soil micro-flora and subsequently increased ammonification and availability of nutrient elements and in turn good growth for plants and directly to better yield and yield components as illustrated by Abou-Seada et al. (1995).

In general, harvest index was also enhanced substantially with the application of Nitrobein as compared with untreated faba bean seeds, in both growing seasons. Mixing the seeds with Nitrobein raised the value of harvest index from 6.05 (0.00 Nitrobein) up to 6.28 (750g Nitrobein)in the first season. Same trend had been observed in the second one .These positive results may be due to inoculation the seeds with biofertilizers improves root development, increase in the rate of water and minerals uptake by roots, excretion of phytohormones and vitamins especially biological N2 fixation as published by Rodelas et al.(1998).For argue the effect of the first and second order interactions on harvest index in the two successive seasons, it could be concluded that, in the second season only (AxB)and (AxC) interactions had significant influence on that studied character. While, in the first season, the second order iteration(AxBxC), only had significant effect on that character, the highest average of harvest index (68.19) attributed to irrigate faba bean plants every 12 days with adding 40kgN/fad. as compost and mixing the

Table(7)The effect of irrigation intervals , organic nitrogen fertilizer and Nitrobein on harvest index for faba bean in 2007/2008and 2008/2009 seasons.

Irrigation intervals (A) days	nitrogen fertilizer Compost (B) kg/fad.	Harvest index							
		2007 season			Mean	2008 season			Mean
		Nitrobein (C) g/fad.				Nitrobein (C) g/fad.			
		0.00	500	750		0.00	500	750	
4	20	52.517	54.813	58.863	55.398	52.183	52.503	54.377	53.021
	30	55.523	55.697	57.307	56.176	53.030	53.013	55.227	53.757
	40	53.947	56.733	57.547	56.076	54.317	53.947	56.640	54.968
	Mean	53.996	55.748	57.906	55.883	53. 177	53.154	55.414	53.915
8	20	50.667	53.330	54.327	52.774	53.060	52.133	53.800	52.968
	30	53.810	55.120	55.393	54.774	56.583	58.197	58.363	52.998
	40	56.280	54.857	56.390	55.842	58.233	58.360	57.570	57.714
	Mean	53.586	54.436	55.370	54.464	55.959	56.230	56.578	56.256
12	20	64.137	66.487	64.910	65.178	65.130	63.130	64.597	64.286
	30	60.570	64.610	65.000	63.393	63.077	63.123	63.943	63.381
	40	63.683	63.203	68.190	65.026	63.447	63.717	63.490	63.551
	Mean	62.797	64.767	66.033	64.532	63.884	63.323	64.010	63.739
Mean of compost	20	55.773	58.210	59.367	57.783	56.791	55.922	57.591	56.768
	30	56.634	58.476	59.233	58.114	57.563	58.111	59.178	58.284
	40	57.970	58.264	60.709	58.891	58.666	58.674	59.233	58.739
Mean of Nitrobein		56.793	58.317	59.770		57.673	57.569	58.667	
LSD at 0.05for									
Irrigation(A)		0.814				0.591			
Compost (B)		1.743				0.533			
Nitrobein(C)		0.928				0.515			
AxB		N.S				0.924			
AxC		N.S				0.812			
BxC		N.S				N.S			
AxBxC		2.785				N.S			

seeds with 750gNitrobein/fad., it was fallowed by irrigation every 12days with adding 20kgN/fad. as compost and mixing the seeds with 500g nitrobein /fad.(66.48).

Chemical propertes:

From Table (8). it was noticed that, in both experimental seasons, both of seed protein and carbohydrate percentages were decreased substantially as increasing irrigation intervals from 4 up to 12 days. The highest percentages of protein and carbohydrate contents associated with irrigate every 4 days. These results are in agreement with those reported by Hamed et al.(1990)and El- Maghraby and Abd-EL-Hay(1994).The application of Nitrobein had significant effect on seed protein, it was increased in general by mixing faba been seeds with 500 or 750g Nitrobein/fad.. as compared with untreated seeds in the first growing season only. Seed protein percentage was affected significantly by(AxB) and (AxC) interactions, in the first season only. It was worthy to mention that, the highest percentage(26.21%) associated with irrigation every 4 days with the application of 40kg N/fad. as compost. On the same line, the same previous irrigation interval and mixing the seeds with 750 g nitrobein/fad. achieved the highest percentage of protein (24.67%).Such effect had been observed, for the second order interaction (AxBxC) on protein percentage, as revealed in Table(8). Irrigation faba been plants every 4days with the application of 40 kg N/fad. as compost, and mixing the seeds with 750 g Nitrobein/fad. gave the highest percentage (26.88%),it was followed by (26.49%) that was obtained from irrigation the plants every 4 days with the same application of N fertilizer as compost and mixing the seeds with 500 g Nitrobein/fad. Seed carbohydrate percentage wasn't affected significantly by the individual studied factors and the other interactions as revealed in Table (8).

Table(8)The effect of irrigation intervals , organic nitrogen fertilizer and Nitrobein on seed protein and seed carbohydrate percentage for faba bean in 2007/2008and 2008/2009 seasons.

Irrigation intervals (A) days	nitrogen fertilizer Compost kg/fad. (B)	Seed protein percentage								Seed carbohydrate percentage							
		2007 season			Mean	2008 season			Mean	2007 season			Mean	2008 season			Mean
		Nitrobein (C) g/fad.				Nitrobein (C) g/fad.				Nitrobein (C) g/fad.				Nitrobein (C) g/fad.			
		0.00	500	750		0.00	500	750		0.00	500	750		0.00	500	750	
4	20	18.880	20.777	23.030	20.896	18.380	21.877	16.627	18.961	56.733	56.813	57.167	56.904	64.993	64.593	65.803	65.130
	30	24.330	25.250	24.110	24.563	20.127	21.700	19.253	20.360	57.260	57.080	57.193	57.178	65.820	65.690	64.040	65.183
	40	25.270	26.490	26.887	26.216	19.253	20.653	18.727	19.544	57.400	57.260	57.230	57.297	65.207	65.460	65.807	65.491
	Mean	22.827	24.172	24.676	23.891	19.253	21.410	18.202	19.622	57.131	57.051	57.197	57.126	65.340	65.248	65.217	65.268
8	20	17.970	19.640	21.140	19.583	16.277	19.427	15.227	16.977	56.807	56.813	56.913	56.844	63.273	62.943	63.550	63.256
	30	19.637	21.027	23.000	21.221	18.380	21.177	16.627	18.728	56.703	56.870	57.037	56.870	61.587	62.317	61.933	61.946
	40	21.247	23.360	24.390	22.999	18.027	21.353	19.253	19.544	56.763	56.910	58.010	57.228	63.700	61.970	62.223	62.298
	Mean	19.618	21.342	22.843	21.268	17.561	20.652	17.036	18.416	56.758	56.864	57.320	56.981	62.520	62.410	62.569	62.500
12	20	13.197	15.593	16.637	15.176	15.753	13.127	14.703	14.528	56.467	56.510	56.867	56.614	57.847	57.630	56.850	57.442
	30	15.057	17.627	18.777	17.153	14.529	15.403	16.627	15.520	56.577	56.657	56.390	56.541	57.163	57.327	58.430	57.640
	40	18.010	19.193	21.360	19.521	15.753	13.303	15.050	14.702	56.700	56.583	56.613	56.632	57.553	57.603	56.907	57.354
	Mean	15.421	17.504	18.924	17.283	15.345	13.944	15.460	14.917	56.669	56.583	56.623	56.596	57.521	57.520	57.396	57.479
Mean of compost	20	16.682	18.703	20.269	18.551	16.802	18.143	15.519	16.822	56.669	56.712	56.982	56.788	62.038	61.722	62.068	61.943
	30	19.674	21.301	21.962	20.970	17.678	19.427	17.502	18.202	56.847	56.869	56.873	56.863	61.523	61.778	61.468	61.590
	40	21.509	23.014	24.212	22.912	17.678	18.437	17.677	17.930	56.954	56.918	57.284	57.052	61.820	61.678	61.646	61.714
Mean of Nitrobein		19.289	21.003	22.148		17.387	18.669	16.899		56.823	56.833	57.047		61.794	61.726	61.727	
LSD at 0.05 for Irrigation(A)		2.421				2.559				0.198				0.521			
Compost (B)		0.471				N.S				N.S				N.S			
Nitrobein(C)		0.369				N.S				N.S				N.S			
AxB		0.816				N.S				N.S				N.S			
AxC		0.639				N.S				N.S				N.S			
BxC		N.S				N.S				N.S				N.S			
AxBxC		1.108				N.S				N.S				N.S			

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دور كلا من فترات الري و السماد النيتروجينى في زيادة إنتاجية الفول البلدي تحت الظروف المصرية

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أجريت تجربتان حقليتان بمزرعة كلية الزراعة -جامعة الأزهر بمدينة نصر- محافظة القاهرة خلال موسمي الزراعة لدراسة تأثير كل من فترات الري (٤-٨- ١٢يوم)ومعدلات السماد النيتروجينى العضوي 2007-2008, 2008-2009

(٢٠-٣٠-٤٠كجم/فدان)من الكمبوست و السماد الحيوي بمعدل ٥٠٠- ٧٥٠جم نيتروبين/فدان على مكونات المحصول وبعض التراكيب الكيماوية لبذور الفول البلدي صنف مصر ١

أعطى الري كل ٤ايام اعلي النتائج في كل من عدد القرون/النبات، وزن١٠٠بذرة ،محصول البذور ،محصول القش ، والنسبة المئوية للبروتين والكربوهيدرات ، بينما الري كل ١٢يوم أعطى اعلي النتائج في دليل الحصاد في الموسمين وكان لإضافة ٤٠كجم عضوي أزوت للفدان على هيئة كمبوست التأثير المعنوي والايجابي على معظم صفات المحصول تحت الدراسة ،كذلك كان للتسميد الحيوي بمعدل ٧٥٠ جم نيتروبين للفدان تأثيره المعنوي والفعال على معظم الصفات السابق ذكرها

كما أظهرت النتائج عند ري نباتات الفول البلدي كل ٤ايام مع إضافة ٤٠كجم نيتروجين عضوي /فدان من الكمبوست وخلط البذور قبل الزراعة بمعدل٥٠٠و٧٥٠جم من النيتروبين، أعطت اعلي النتائج للصفات تحت الدراسة خلال الموسم الأول والثاني