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EFFECT OF NUMBER OF IRRIGATIONS AND FARMYARD MANURE APPLICATIONS ON LENTIL

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Abstract

A split plot field experiment was carried out on an alluvial soil to study the effect of different number of irrigations and FYM addition on seed & straw yields of lentil and plant content of NPK and seed's protein. The results reveal that all the studied parameters were significantly increased due to the increase of number of irrigations up to 3 irrigations, except K contentin in seeds, as the increase was insignificant. Similar results were recorded with FYM additions, without any exception up to 15 tons/feed.

INTRODUCTION

Lentil (*Lens culinaris*, med.,) is one of the important leguminous crops grown in Egypt. Plans for increasing agriultural production to overcome the problem of food shortage need attenion. Research based on crop water requirments, fertilization and soil conditioning helps in improving the situation and the achievement of higher yields. Gibali *et al.* (1968) stated that irrigating lentil 3 times increased its yield. Dastane et al. (1971) obtained the highest seed yield of lentil with water depth 300 mm applied over three irrigations. El-Warraky (1978) found that seed yield of lentil significantly increased by the application of two irrigations over one.

Concerning the effect of organic matter, El-Kommos and El-Basioni (1989) reported that the residual effect of chaffed peanut applied to the soil as manure signif-

icantly increased the vegetative growth of straw and seed yields of lentil crop. The positive effect of FYM additions on straw and seed yields and some constituents of chick pea and broad bean plants was recorded by Dahroug *et al.* (1992) and Derar and Gendy (1994).

The present work aims at evaluating the effect of number of irrigations and FYM applications on lentil yield of seed and straw and some plant constituents ; e.g. NPK concentrations in roots, shoots, leaves and seed as well as protein content in seeds.

RESULTS AND DISCUSSION

I: Effect of number of irrigation:

Data in Table 3 show that seed and straw yields of lentil were significantly in creased by increasing number of irrigations. Values of seed and straw yields (741 and 1355 kg/f) obtained from the three irrigations treatment exceeded those of one irrigation by 54% and 64%, respectively. These results are in agreement with those of El-Warraky (1978), Sharma and Prasad (1984) and El-Ryes (1990).

Table 1 . Soil physical and chemical properties

Mechanical analysis					PH	E.C. mmhos / cm.	$CaCo_3$ %	O.M. %	Total N ppm	Avail. P ppm	Avail. K ppm
Coarse send %	Fine send %	Silt %	Clay %	Soil texture							
1.51	46.10	27.20	22.40	Sandy clay loam	7.4	0.41	1.48	0.72	628	8.4	248

Table 2 . Characteristics of FYM

Moisture content %	O.M. %	Total C %	Total N %	Total P %	C/N ratio
22.40	14.30	8.29	0.64	0.32	12.95

On the other hand, Singh et al. (1979) concluded that two irrigations; the first at 45 days after sowing and the other at early pod stage gave the highest yield on a sandy loam soil in winter season. The whole plant content of NPK was significantly increased as a result of increasing irrigation up to 3 irrigations. The nutrients order of response to increasing irrigation is N> P>K. Seed contents of N, P and protein were significantly increased as a result of increasing irrigation, while the increase in K of seed was insignificant.

II: Effect of FYM

The application of FYM increased proportionally and significantly both seed and straw yields of lentil. The highest values (745 and 1269 kg / fed.) were obtained at the rate of 15 tons FYM/fed. These values exceedrd those of the control by 64% and 53%, respectively. El-Kommos and Basioni (1989), Dehroug and Gendy (1994) reported similar results.

Regarding the effect of FYM application on plant content of NPK, data in Table 4 revealed a significant increase in the whole plant and seed content of NPK beside the perotein seed content . In this respect the highest results were obtained from the treatment which received 15 tons/fed. FYM.

In order to evaluate the relative effect of either irrigation or FYM on the studied parameters, the mean values of percentage increase in each parameter as affected by each treatment (irrigation and FYM) are presented in Table 5. FYM application is superior to the number of irrigations in increasing the seed yield, while the opposite is true for straw yield. FYM is also superior to numbers of irrigations in increasing NPK content in both whole plant and seed. It is also noticed that the increase in N and K contents of the whole plant due to either irrigation or FYM application is more pronounced than those in seeds, while the increase in P content is higher in the seeds.

It can be concluded that increasing number of irrigations enhances the vegetative growth of lentil plants while FYM application encourages the fruit growth and nutrient uptake.

The positive effect of FYM on lentil yield and plant constituents may be due to the beneficial effect of organic matter on soil properties, also due to its contribution to some of the plant needs from both macro- and micronutrients and finally to its effect on raising the availability of nutrients in the root media (Gati 1982).

Table 3 . Effect of number of irrigations on seed and straw yield, NPK concentrations in the whole plant and seeds and protein of seeds.

Number of irrigations	Yield in kg/fed.				N Conc.				P Conc.				K Conc.				Protein of seed			
	Seed		Straw		Whole plant seed				Whole plant seed				Whole plant seed							
	Kg	%	Kg	%	ppm	%	ppm	%	ppm	%	ppm	%	ppm	%	ppm	%	%	%	incr	%
1	482	0.0	828	0.0	9100	0.0	33800	0.0	2900	0.0	7300	0.0	1900	0.0	1400	0.0	21.30	0.0		
2	578	19.8	1007	21.6	11400	25.3	35000	3.6	3100	6.9	8600	17.8	2100	10.5	1500	7.1	22.14	3.9		
3	740	53.5	1354	63.5	12500	37.4	39000	15.4	3600	24.1	9800	34.3	2200	15.8	1600	14.3	24.80	16.6		
LSD 5%	38.8				51.0			330		530			920		390	110	N.S.		0.28	
LSD 1%	51.9				68.0			470		750			1300		470	160	N.S.		0.40	

Table 4 . Effect of FYM on seed and straw yield, NPK concentration in the whole plant and seeds and protein of seeds.

FYM ton/ fed.	Yield in kg/fed.				N Conc.				P Conc.				K Conc.				Protein of seed			
	Seed		Straw		Whole plant		seed		Whole plant		seed		Whole plant		seed					
	Kg	%	Kg	%	ppm	%	ppm	%	ppm	%	ppm	%	ppm	%	ppm	%	%	%	the incr.	%
Control	454	0.0	831	0.0	7000	0.0	31000	0.0	2750	0.0	53.00	0.0	1500	0.0	1200	0.0	19.58	0.0		
5	544	19.8	1000	20.3	10800	54.3	35000	12.9	3192	14.3	8400	58.5	1800	20.0	1500	25.0	22.05	12.6		
10	658	44.9	1145	37.8	12000	71.4	37000	19.4	3405	23.8	9800	84.9	2300	53.3	1600	33.3	23.05	17.7		
15	745	64.1	1269	52.7	13100	87.1	41000	32.3	3682	33.9	10800	103.8	3700	146.7	1700	41.7	25.75	31.5		
LSD 5%	51				330			530			920			110		250			0.28	
LSD 1%	68				470			750			1300			160		350			0.40	

Table 5 . Mean values of percentage of various parameters increase affected by irrigation and FYM.

Parameter		Irrigation	FYM
Seed yield		36.69	42.93
Straw yield		42.55	36.93
N	of whole plant	31.35	70.93
	of seed	9.50	21.50
P	of whole plant	15.50	24.00
	of seed	26.05	82.07
K	of whole plant	13.15	73.33
	of seed	10.70	33.36

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أثر استخدام الرى والتسميد العضوى على محصول العدس

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أقيمت تجربة حقلية على أراضى رسوبية لدراسة اثر كل من اختلال عدد الريات واضافة السماد العضوى على محصول الحبوب والقش ، للعدس ومحتوى النبات من النيتروجين والفوسفور والبوتاسيوم وكذلك بروتين الحبوب .

ولقد اوضحت النتائج ان كل العوامل موضع الدراسة قد زادت معنويا بزيادة الرى حتى ٣ ريات ماعدا محتوى الحبوب من البوتاسيوم حيث كانت الزيادة غير معنوية.

كما اذت اضافة السماد العضوى الى زيادة كل من العوامل المدروسة زيادة معنوية.