EVALUATION THE USE OF ORGANIC AND BIO-FERTILIZERS AS A TOTAL OR PARTIAL REPLACEMENT OF NITROGEN FERTILIZER UNDER NEW RECLAIMED SOIL CONDITION IN TWO WHEAT CULTIVARS.

Abd El-Samie, F.S., Megawer, E.A., and Ismail, S. K. A., Hafiz, A.H.R.
Agronomy Department, Faculty of Agriculture, Fayoum University, El -Fayoum, Egypt

ABSTRACT

Tow field trials were carried out in 2011/2012 and 2012/2013 winter seasons to study the evaluation used the organic manure and bio-fertilizer as a total or partial replacement of nitrogen fertilizer on yield and protein quality of two wheat varieties (*Triticum aestivum*, L.) under newly reclaimed soils. The field experiments were layout at the Experimental Farm, of the Faculty of Agriculture, Fayoum University, Egypt. The treatments were set in Randomized Complete Block Design in factorial arrangement with three replications. The results showed that significant effect for wheat varieties were obtained on plant height and spike length in the 1st season and total protein percentage in both seasons but were insignificantly on other traits. The superiority was for Sakha 94 in most characters. Fertilizer treatments were significantly effect for all studied traits except plant height and number of tillers/plant in 2nd season and spike length in 1st season. F_3 (30 m^3/fed organic manure + bio-fertilizer + 37.5kg N/fed (50 %) gave the superiority in most traits in both seasons followed by F_4 (30 m^3/fed organic manure + bio-fertilizer + 18.75kg N/fed.(25%) or F_5 (30 m^3/fed. organic manure + 37.5kg N/fed.(50 %)treatments. Interaction between varieties and fertilizer treatments was significantly effect in most of studied traits except plant height and spike length. On the other hand, applying of F_3 (30 m3/fed organic manure + bio-fertilizer + 37.5kg N/fed.(50 %) with Sakha 94 or Sakha 93 gave higher values of grains yield in both seasons. Finally, by using organic fertilizer and/or bio-fertilizer with half dose of mineral fertilizer it could be plant growth and yield. Besides, using bio-fertilizers that contain different microbial strains had led to decrease in the use of chemical fertilizers and had provided height products free of harmful agrochemicals for human safety. In path coefficient analysis straw yield and spike length revealed that positive direct effect and plant height through spike length were positive indirect effect on yield. These traits can be considered for selection.

Key word: *Wheat, Organic manure, Bio-fertilizer, Nitrogen fertilizer, Varieties.*

INTRODUCTION

Wheat (*Triticum aestivum* L.) is one of the most important cereal crops in Egypt. Nowadays, major efforts have been made to minimize the gap

between production and consumption. Production of wheat grains in Egypt is not enough to achieve self-sufficiency due to the high consumption rate per capita and high increasing rate in population every year its cultivated area is about 3.1 million feddan. The local production is about 9.5 million ton however; it covers less than 60% of local consumption **(FAO, 2013).** Wheat is one of the cheapest sources of carbohydrate and also contains a considerable amount of protein, minerals and vitamins. There are many factors, which can help to increase wheat production of which the use modern varieties and judicious fertilization are important. It is well recognized that crop productivity depends on adequate plant nutrient and organic matter content of the soil (**Lemma, 2015, Babar *et al,* 2016 *and* Bavar *et al,* 2016**).

Manure play an important role in improving physical, chemical and biological properties of soils. Due to low nutrient content and slow acting nature, organic manure alone may fail to meet the high nutritional requirements of crops. Some of the plant nutrients, when added to the soil in inorganic form, have low efficiency as compared with the effect of the same nutrients applied along with organic manure. Thus, organic manure reduces the application rate of chemical fertilizers and also helps to solve the problem of micro-nutrient deficiency in the soil (**Ali *et al,* 2011 and Woyema *et al,* 2012**). Biofertilization method plays an important role in the plant nutritional requirements. Biofertilization method plays an important role in the plant nutritional requirements. *Azotobacter* is a heterotrophic, aerobic micro – organism, fixing nitrogen as non-symbiotic which is a good source of bio-fertilizer to improve the growth and yield of cereals and many other crops (**Singh and Prasad, 2011, Davari *et al,* 2012, Noreen and Noreen 2014 and Al-Erwy *et al,* 2016)**. Fertilizer N and organic N have their own merits and demerits and the drawbacks associated with either sources of these plant nutrients are often overcome when these are mixed in judicious combinations (**Abd El-Razek and El-Sheshtawy 2013**).

Therefore, The objective of the present investigation was to evaluate the effects of inorganic nitrogen, organic manure and bio-fertilizer applications, and their combinations on grain yield and protein quality of wheat varieties and thereby estimate the direct and indirect effects of these characters on grain yield.

MATERIALS AND METHODS

Two field experiments were conducted at the Experimental Farm of the Faculty of Agriculture Fayoum, University in Demo Farm, during 2011 / 2012 and 2012 / 2013 seasons. The experiments were carried out to study the evaluation used the organic manure and bio-fertilizer as a total or partial replacement of nitrogen fertilizer under new reclaimed soil conditions in two wheat cultivars (*Triticum aestivum*, L.).

***Treatments*. Varieties (V):** Two wheat cultivars i.e. Sakha 93 (V_1) and Sakha 94 (V_2) were obtained from Field Crop Research Institute, Agricultural

Research Center, Giza, Egypt. **Fertilizer:** Organic fertilizer: Two organic manure levels i.e. (15 and 30 m^3/fed.), Mineral fertilizer: Three nitrogen fertilizers levels (Urea, 46 %N was the respective sources of the nitrogen) i.e. 75 kg N/fed. (100 %), 37.5 kg N/fed.(50%) and 18.75 kg N/fed.(25 %). Bio-fertilizer (*Azotobacter*) was inoculated the seeds.

Fertilizer treatment combinations. F_1: 75 kg N/fed. (Control), F_2: 30 m^3/ fed. organic manure + bio-fertilizer, F_3: 30 m^3 /fed. organic manure + bio-fertilizer + 37.5 kg N/fed., F_4: 30 m^3/fed. organic manure + bio-fertilizer + 18.75 kg N/fed., F_5: 30 m^3/fed. organic manure + 37.5 kg N/fed., F_6: 15m^3 /fed. organic manure + 37.5 kg N/fed. and F_7: bio-fertilizer + 37.5 kg N/fed.

Soil properties. The soil texture was sandy loam with organic matter of 0.76 and 0.77 %, EC of 4.01 dS/m and 3.60, pH values of 7.70 and 7.80, Total nitrogen (ppm) of 42.34 and 44.52 in the first and second season respectively.

Experimental design. The experiment was laid out in randomized complete block design in factorial arrangement with three replications was used. The size of each plot was 10.5 m^2 (3.5 m long and 3.0 m wide).

Data recorded: *Wheat yield traits were recorded as five plants from each plot were chosen at random to determine some agronomic data including:* Plant height (cm), spike length of main stem (cm) and number of tillers/plant, straw yield (t/fed.), grain yield (t/fed) and total protein percentage in grains (this trait measured by near infrared analyzer according to Granland **and Zimmerman, 1975**).

***Statistical Analysis*.** All the data collected of wheat at the two seasons were statistically analyzed according to the procedures lined by **Snedecor and Cochran (1980)**. To compare treatment means, LSD at 5 % level of significance was used according to **Stell and Torrie (1960)**. All statistical analysis was carried out using analysis of variance technique (ANOVA) by means of "**CoStat" computer software package (1990).**

RESULTS AND DISCUSSION

Effect of varieties:

The results illustrated in table (1) show the effect of wheat varieties and treatments of fertilizer. Plant height and spike length were significantly in first season only and protein percentage was significantly in both seasons, Whereas, there was no significant effect of varieties on other traits in both seasons. Sakha 94 variety gave the tallest plants (84.48 and 87.29cm) and protein percentage (11.89 and 12.02%) in 1st and 2nd seasons respectively**,** while Sakha 93 cultivar recorded the tallest spike in both seasons. This may be due to the differences in genetic construction , these results are in generally agreement with those obtained by **Mattas *et al* (2011), Zaki *et al* (2012), Abd El-Razek and El-Sheshtawy (2013), Radwan *et al* (2014), Lemma (2015), Mehasen *et al* (2015), Abo- Remaila and Abo El-Enin (2016)** and **Babar *et al* (2016).** In contrast to the present results**, Salah (2002)** he found that the two cultivars did not vary significantly with respect to these traits.

Table (1): Effect of wheat varieties and treatments of fertilizer on yield and some yield traits in two seasons (2011/2012 – 2012/2013).

Treatments	plant height (cm)		Spike length (cm)		Number of tillers per plant		Straw yield (ton/ fed.)		Grain yield (ton/fed.)		Protein %	
	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd
Varieties (V)												
V_1=Sakha93	77.19	85.95	8.76	9.71	4.57	5.10	3.11	36.97	1.76	2.44	11.51	11.71
V_2=Sakha94	84.48	87.29	8.14	9.43	4.81	5.19	3.10	37.12	1.89	2.32	11.89	12.02
$LSD_{0.05}$ for V	**3.99**	**n.s**	**0.56**	**n.s**	**n.s**	**n.s**	**n.s**	**n.s**	**n.s**	**n.s**	**0.21**	**0.22**
Fertilizer (F)												
F_1	82.67	85.67	8.50	9.50	4.33	5.17	3.39	3.12	1.92	2.59	7.53	7.53
F_2	75.67	81.67	7.83	9.83	5.00	5.33	3.43	3.27	1.97	2.31	11.02	11.03
F_3	85.67	88.83	9.00	9.67	4.50	5.00	3.57	3.17	2.23	2.59	14.38	14.79
F_4	81.83	89.33	8.67	9.33	5.17	5.50	2.82	2.91	1.68	2.45	14.15	14.42
F_5	83.33	88.83	8.83	10.00	4.67	5.33	3.21	2.85	1.75	1.93	12.53	12.78
F_6	80.67	87.33	8.67	9.67	4.33	4.83	2.68	3.33	1.62	2.22	9.21	9.39
F_7	76.00	84.67	7.67	9.00	4.83	4.83	2.58	3.08	1.59	2.56	13.07	13.10
$LSD_{0.05}$ for F	**3.44**	**n.s**	**n.s**	**0.58**	**0.57**	**n.s**	**0.23**	**0.25**	**0.31**	**0.26**	**0.40**	**0.41**

F_1=Mineral fertilizer 75 N (Control), F_2=Organic 30 m^3 + Bio-fertilizer, F_3=Organic 30 m^3 + Bio-fertilizer + 37.5 N, F_4=Organic 30 m^3 + Bio-fertilizer + 18.75 N, F_5=Organic 30 m^3 + 37.5 N, F_6=Organic 15 m^3 + 37.5 N, F_7=Bio-fertilizer + 37.5 N, 1st = 1st season (2011/2012), 2nd = 2nd season (2012/2031) and n.s= no significant.

Effect of fertilizer treatments:

Data in table (1) shows the effect of fertilizer treatments on yield and some yield traits. Fertilizers had a significant effect for all traits under study except plant height and number of tillers/plant in 2nd season and spike length in 1st season. F_3 gave the tallest plants (85.67 and 88.83cm) in both seasons; respectively .F_5 treatment followed by F_3 treatment gave the tallest spike (10 and 9.83cm) in 2nd season, respectively. F_3 treatment gave the highest straw (3.575 and 3.17 t/fed.) and grain yield (2.23 and 2.59 t/fed.) and protein percentage (14.38 and 14.79%) in the 1st and 2nd seasons, respectively, followed by F2 treatment for straw and grains yield in both season and F4 treatment for protein percentage, its may be due to the soil fertility or its may be due to the organic manure, bio-fertilizer and nitrogen fertilizer increased mineral contents of soil and adjusted physical characters of soil to good conditions, this finding are conceded with those obtained by **Shah *et al* (2010), Tahir *et al* (2011), Zaki *et al* (2012), El-Nady and Borham (2013), Esmailpour *et al* (2013), Zahoor(2014), Mandic *et al* (2015), Mehasen *et al* (2015) and Babar *et al* (2016).**

Effect of the interaction:

The interaction of wheat varieties and fertilizer treatments are presented in table (2). Plant height and spike length were insignificant in both seasons**,** while significant for number of tillers /plant and straw yield/fed in both seasons. Also, the interaction between wheat varieties and fertilizer

treatments for grains yield and protein percentage were significantly in 1st season**.** The highest grains yield was recorded from two varieties when treated by F_3treatment (2.23, 2.24, 2.66 and 2.52 ton/fed) in the 1st and 2nd season respectively, or by F_7 treatment (2.8 ton) in 2nd season. The same trend in the protein percentage which surpassed V_1F_3 (14.08 and 14.63%) or V_2F_3 (14.69 and 14.95%) in the 1st and 2nd season respectively. This results are in harmony with those obtained by **Zeidan *et al* (2009) and Zaki *et al* (2012)** found that the effect of interaction between mineral, organic fertilizer and bio-fertilizers on plant height (cm), number of tillers/m^2, spike length (cm), grain yield (ton /fed) of wheat were significant in both seasons and crude protein percentage in the second season**, Abd El-Razek and El-Sheshtawy (2013)** found that significant effects due to bio-fertilizer with nitrogen fertilizer for plant height, yield and its components and protein percent, except spike length in combined analysis. Microbin as bio-fertilizer treatment was significantly increased plant height grain yield and straw yield (ton/ha) and protein percentage.

Table (2): Effect of the interaction between wheat varieties and fertilizer treatments on yield and some yield traits in 2011/2012 and 2012/2013 seasons.

Fertilizer	Plant height		Spike length		Number of tillers per plant		Straw yield/ fed		Grain yield/ fed		Protein %	
	V_1	V_2	V_1	V_2	V_1	V_2	V_1	V_2	V_1	V_2	V_1	V_2
1st season (2011/2012)												
F_1	76.67	88.67	9.00	8.00	4.67	4.00	2.93	3.85	1.70	2.15	7.57	7.49
F_2	75.00	76.33	7.67	8.00	5.67	4.33	3.61	3.25	2.07	1.88	11.01	11.02
F_3	81.00	90.33	9.33	8.67	3.67	5.33	3.51	3.63	2.23	2.24	14.08	14.69
F_4	77.00	86.67	9.00	8.33	5.00	5.33	2.59	3.04	1.55	1.81	14.03	14.27
F_5	79.33	87.33	9.00	8.67	4.00	5.33	3.03	3.38	1.69	1.81	12.20	12.85
F_6	78.67	82.67	9.33	8.00	4.33	4.33	2.68	2.67	1.54	1.70	8.63	9.79
F_7	72.67	79.33	8.00	7.33	4.67	5.00	2.55	2.61	1.53	1.65	13.05	13.08
$LSD_{0.05}$ for V*F	**n.s**		**n.s**		**0.81**		**0.32**		**0.24**		**0.56**	
2nd season (2011/2012)												
F_1	86.33	85.00	10.00	9.00	5.67	4.67	2.73	3.50	2.52	2.66	7.55	7.51
F_2	83.33	80.00	10.00	9.67	5.33	5.33	3.22	3.33	2.24	2.38	10.96	11.10
F_3	89.33	88.33	10.00	9.33	5.00	5.00	3.11	3.24	2.66	2.52	14.63	14.95
F_4	87.00	91.67	9.00	9.67	5.33	5.67	3.08	2.73	2.45	2.45	14.39	14.45
F_5	86.67	91.00	10.00	10.00	4.67	6.00	3.10	2.59	2.10	1.75	12.64	12.92
F_6	87.33	87.33	9.67	9.67	4.67	5.00	3.28	3.37	2.31	2.14	8.77	10.00
F_7	81.67	87.67	9.33	8.67	5.00	4.67	3.22	2.94	2.80	2.31	13.00	13.20
$LSD_{0.05}$ for V*F	**n.s**		**n.s**		**0.82**		**0.36**		**n.s**		**n.s**	

F_1=Mineral fertilizer 75 N (Control), F_2=Organic 30 m^3 + Bio-fertilizer, F_3=Organic 30 m^3 + Bio-fertilizer + 37.5 N, F_4=Organic 30 m^3 + Bio-fertilizer + 18.75 N, F_5=Organic 30m^3 + 37.5 N, F_6=Organic 15 m^3 + 37.5 N, F_7=Bio-fertilizer + 37.5 N, 1st = 1st season (2011/2012), 2nd = 2nd season (2012/2031) and n.s= no significant.

Path coefficient analysis

Path coefficient technique was performed to divide the correlation coefficients between grain yield and some yield related traits into direct and indirect effects via alternative traits or pathways. Table 3 exhibited that straw yield followed by spike length, number of tillers/plant and plant height exerted positive direct effect on grain yield (0.416, 0.254, 0.119 and 0.115, respectively). The highest indirect effects on grain yield were observed with plant height through spike length (0.09) followed by number of tillers /plant through spike length (0.055), spike length through plant height (0.053) and plant height through straw yield. Similar results were reported by **Singh and Diwivedi, (2002)** and **Leilah and Al-Khateeb (2005)**. Conversely, **Baranwal *et al.* (2012)** revealed that spike length and 1000-grain weight exhibited the maximum positive direct effect.

Table (3): Estimation of direct effect indirect effect for some studied traits on the grain yield/feddan of bread wheat over two seasons.

Traits	Values	r
1- Effect of plant height on grain yield/fed:		
Direct effect	0.150	
Indirect effect through spike length	0.090	
Indirect effect through number of tillers/plant	0.030	
Indirect effect through straw yield	0.040	
Indirect effect through protein percentage	0.010	0.320**
2- Effect of spike length on grain yield/fed:		
Direct effect	0.254	
Indirect effect through plant height	0.053	
Indirect effect through number of tillers/plant	0.026	
Indirect effect through straw yield	-0.020	
Indirect effect through protein percentage	0.001	0.314**
3- Effect of number of tillers/plant on grain yield/fed:		
Direct effect	0.119	
Indirect effect through plant height	0.038	
Indirect effect through spike length	0.055	
Indirect effect through straw yield	-0.047	
Indirect effect through protein percentage	0.014	0.179
4- Effect of straw yield on grain yield/fed:		
Direct effect	0.416	
Indirect effect through plant height	0.014	
Indirect effect through spike length	-0.012	
Indirect effect through number of tillers/plant	-0.013	
Indirect effect through protein percentage	-0.009	0.395**
5- Effect of protein percentage on grain yield/fed:		
Direct effect	0.073	
Indirect effect through plant height	0.019	
Indirect effect through spike length	0.004	
Indirect effect through number of tillers/plant	0.023	
Indirect effect through straw yield	-0.053	0.066

* and** is significant at $P \leq 0.05$ and $P \leq 0.01$, respectively.

REFERENCES

Abd El – Razek, U. A. and A . A . El Sheshtawy (2013) . Response of some wheat varieties to Bio and mineral nitrogen fertilizers. Asian Journal of Crop Science: 1 – 9 .

Abo - Remaila, S. I. and M. M. Abou El Enin(2016). Effect of applying Potassumage and Banana ash combination as bio fertilizers on productivity Of the Egyptian wheat . Journal of Basic and Environmental Sciences 3 : 98 – 106.

Al-Erwy, A.S. , S. O. Bafeel and A. Al-Toukhy (2016) . Effect of Chemical, Organic and Bio Fertilizers on Germination, Growth and yield of Wheat (*Triticum aestivum*. L) Plants Irrigated With Sea Water . Agric. Biol. J. N. Am., 7(3) : 121 - 133 **.**

Ali , A. , A . Ahmed , W . H . Syed , T . Khaliq, M . Asif , M . Aziz and M . Mubeen (2011). Effect of Nitrogen on Growth and Yield Components of Wheat . Sci. Int. (Lahore), 23 (4): 331– 332 .

Babar, A. A. , M. A. Ansari, G. M. Laghari, A. A. Soomro and M. N. Kandhro (2016) . Effect of Macro-Nutrient and Humic Acid on Growth and Yield of Different Wheat Genotypes . Sci. Int. (Lahore) , 28(3), 2655 -2660.

Bavar , M. , H. H. S. Abad and Gh. Noormohamadi (2016) . TheEffects of Different Levels of Nitrogen on Yield and Yield Components of Rain fed Wheat in Two Regions of North. Khorasan . Open Journal of Ecology, 6 , 443 – 451.

Costat Statistical Software (1990). Microcomputer program analysis Version 4.20, Cohort Software, Berkeley, CA.

Davari , M . R . , S . N . Sharma and M . Mirzakhani (2012) . The Effect of Combinations of Organic Materials and Bio –fertilizers on Productivity , Grain Quality , Nutrient Uptake and Economics in Organic Farming of Wheat . Journal of Organic Systems , 7 (2) : 26 – 35 .

El-Nady , M. A. and T. I. Borham (2013). Influence of Different Tillage Systems and Fertilization Regimes on Wheat Yield, Wheat Components and Water Use Efficiency .Egypt. J. Soil Sci. ,53 (4) , pp. 579 – 593.

Esmailpour , A . , M . Hassanzadehdeloueiand A . Madani (2013) . Impact of Livestock Manure , Nitrogen and bio – fertilizer (Azotobacter) on Yield and Yield Components of Wheat (*Triticum aestivum* L.). Cercetari Agronomic in Moldova, XL V1 (2) (154) / : 5 – 15 .

FAO (Food and Agriculture Organization of the United Nations) , 2013. FAOSTAT : World Crop Production data . Accessed on 23 March , 2014 . Available at : (http : // www. faostst . fao. org / site) .

Granland , M . and D . C . Zimmerman (1975) . Oil Content of Sunflower Seed as Determined by Wide Line Nuclear Magnetic Resonance . Acad. Sci. , 27 : 123 – 133 .

Jala-Abadi, A. L. , S.A. Siadat, A.M. Bakhsandeh, G. Fathi and K.H.A. Saied(2012) . Effect of Organic and Inorganic Fertilizers on Yield and Yield Components in Wheat (*T. aestivum* and *T. durum*) genotypes . Adv. Environ. Biol., 6(2): 756 – 762**.**

Lemma, E. (2015). Effect of blended fertilizers on yield and yield traits of durum wheat (*Triticum Turgidum*l. Var. *Durum*) varietiesinada district, central Ethiopia . M. Sc. Thesis , fac. Agric. Haramaya Univ.

Mandic , V. ,V. Krnjaja, Z. Tomic , Z. Bijelic , A. Simic , D. R. Muslic, and M. Gogic (2015). Nitrogen fertilizer influence on wheat .yield and use efficiency under different environmental conditions. Chilean Journal of Agricultural Research , 75 (1): 92 – 97**.**

Mattas , K . K . , R . S . Uppal and R . P . Singh (2011) . Effect of Varieties and Nitrogen Management on the Growth , Yield and Nitrogen Uptake of Durum Wheat . Res. J . Agric. Sci., 2 (2) : 376 – 380 .

Mehasen, S. A. S., S. A. Badawy and S. Sh. Abdullah (2015) . Influence of bio and mineral nitrogen fertilizers on productivity of some bread wheat varieties . Journal of Food, Agriculture &Environment , 13 (2) :162 – 167 .

Noreen, F. and S. Noreen (2014) .Effect of Different Fertilizers on Yield of Wheat . International Journal of Science and Research (IJSR) , 3 (11): 1596 – 1599 .

Radwan, F.I. , M.A. Gomaa, M.A.A. Naser and I. F. Mussa (2014). Response of some Wheat Varieties to Humic Acid, Mineral and Bio-fertilization on Productivity and Quality . Middle East Journal of Agriculture Research , 3 (3) : 631 - 637.

Saleh , M . E . (2002). Response of two wheat cultivars to seeding rates and nitrogen levels . Zagazig . J. Agric. Res. , 29 : 1367 – 1378 .

Shah , S. A . , S . M. Shah , W. Mohammad , M . Shafi , H. A. Q Nawaz , S. S. Zadi and M . Amir (2010) . Effect of Integrated Use of Organic and Inorganic Nitrogen Sources on Wheat Yield . Sarhad J. Agri. , 26 (4): 559 – 563 .

Singh, R. R. and K . Prasad (2011). Effect of Bio – Fertilizers on Growth and Productivity of Wheat (*Triticum aestivum*). J. of Farm Sci. 1(1): 1–8.

Snedecor , G. A. and A. D. Cochran (1980). Statistical Methods 7thEdition, Iowa State Univ.

Steel, R. G. D. and J. H. Torrie (1960). Principles and Procedures of Statistics. McGraw Hill Book Co. Inc . New York .

Tahir , M. , M. Aqub , H. M. R. Javeed , M. Naee, H. – UR – Rehman , M. Waseem and M. Ali (2011). Effect of Different Organic Matter on Growth and Yield of Wheat (Triticum aestivum , L .)Pak . J . Life Soc. Sci. , 9 (1) : 63 – 66 .

Woyema , A . , G . Bultosa and A. Taa (2012) . Effect of Different Nitrogen Fertilizer Rates on Yield and Yield Related Traits for Seven Durum Wheat (*Triticum turgidum* L. Var Durum) Cultivars Grown at Sinana, south Eastern Ethiopia . African J . of Food , Agri. , Nutrition and Development, 12 (3): 6079 – 6094 .

Zahoor (2014) . Influence of integrated use of chemical and organic fertilizers on yield and yield components of wheat . Intl. J. Agri. Crop Sci. , 7 (1) : 21 - 25.

Zaki , N . M . , M . A . Gomaa , F . I . Radwan , M . S . Hassanein and A . M . Wali (2012). Effect of Mineral , Organic and Bio – Fertilizers on Yield , Yield Components and Chemical Composition of Some Wheat Cultivars . J . Appl. Sci. Res. , 8 (1) : 174 – 191 .

Zeidan , E . M . , I . M . Abd El – Hameed , A . H . Bassiouny and A . A . Waly (2009). Effect of Irrigation Intervals , Nitrogen and Organic Fertilization on Yield , Yield Attributes and Crude Protein Content of Some Wheat Cultivars Under Newly Reclaimed Saline Soil Conditions. 4th Conference on Recent Technologies in Agriculture :298 – 307 .

الملخص العربى

تقييم استخدام الأسمدة العضوية والحيوية كبديل كلى أو جزئي للسماد الأزوتى واهم الصفات مساهمة في المحصول تحت ظروف الأراضي حديثة الاستصلاح لصنفين من القمح

ا.د فوزي سيد عبدالسميع، ا.د اكرام علي مجاور، د. سمير كامل علي، م. احمد حافظ ربيع
قسم المحاصيل– كلية الزراعة– جامعة الفيوم

أقيمت تجربتان حقليتان بمزرعة كلية الزراعة – جامعة الفيوم – بمنطقة دمو– محافظة الفيوم خلال الموسمين ٢٠١١/٢٠١٢، ٢٠١٢/٢٠١٣ وذلك لدراسة تقييم استخدام الأسمدة العضوية والأسمدة الحيوية كبديل كلى أو جزئي للسماد الأزوتى واهم الصفات مساهمة في المحصول تحت ظروف الأراضي حديثة الاستصلاح لصنفين من القمح هما سخا٩٣، سخا٩٤. تم ترتيب المعاملات فى تجربة عاملية فى تصميم قطاعات كاملة العشوائية فى ثلاث مكررات. اظهرت النتائج تأثيرا معنويا للاصناف علي صفتي طول النبات وطول السنبلة في الموسم الاول وعلي نسبة البروتين في الحبوب في كلا الموسمين وكان التأثير غير معنوي علي باقي الصفات، وتفوق الصنف سخا ٩٤ في معظم الصفات تحت الدراسة. واظهرت معاملات التسميد تأثيرا معنويا علي صفة طول النبات وعدد الافرع/للنبات في الموسم الاول وعلي طول السنبلة في الموسم الثاني وتأثرت باقي الصفات الاخري معنويا في كلا الموسمين. أظهر التفاعل بين الأصناف ومعاملات التسميد تأثيرا معنويا على صفة عدد الافرع علي النبات ومحصول القش (طن/فدان) فى كلا الموسمين وعلى صفة محصول الحبوب (طن/فدان) ونسبة البروتين فى الحبوب فى الموسم الأول، ولكن كان غير معنويا على صفة ارتفاع النبات (سم)، طول سنبلة الساق الرئيسى(سم) فى كلا الموسمين. واعطت المعاملة تسميد عضوى بمعدل ٣٠م^{3}/ف + تسميد حيوى+ ٥٠% سماد أزوتى موصى به (F_3) مع الصنف سخا٩٤ أو سخا٩٣ اعلي قيم لمحصول الحبوب في الموسمين. وبدراسة التاثير المباشر وغير المباشر علي المحصول حيث كانت صفة محصول القش وطول السنبلة اعلي تأثير مباشر، وصفة طول النبات من خلال طول السنبلة اعلي تأثير غير مباشر علي المحصول. وعلية يوصي باستخدام السماد العضوى مع او بدون السماد الحيوى مع نصف الكمية الموصى بها من السماد المعدنى لزيادة المحصول فى الاراضى المستصلحه حديثا والذى كان يمكن الحصول عليه من السماد المعدنى بمفرده ولكن باستخدام الأسمدة السابقة يقلل من استخدام السماد المعدنى ويحسن المنتج الذى يكون أمن لحياة الأنسان وأيضا يحد من تلوث البيئة مع تقليل التكاليف المستخدمة.