

Drjawad58@yahoo.com .

( 40 )  
 60 1- . 100  
 ) ( Fe + Zn ) 1- .  
 ( 2012  
 34.48 1- . 2.671 83.7 1- . 2.54 Fe + Zn 1- .  
 1- . 28.97 1- . 2.291 77.14 1- . 2.34  
 :

*Solanum tuberosum* L.

% 2 - 1 % 52 - 15 % 29 - 15  
 70 % 1  
 ) %  
 .( 2000 Krylova 1998 Makaraviciute  
 1994 Davis 1994 Santo 1993 Luna 1987 Amberg )  
 ( 2011 Moliavko  
 )  
 7.6 pH  
 % 20 CaCO<sub>3</sub>  
 )  
 .( 2010 2009

Wittner )

20

(2007)A-Ebadi .( 1999

تاريخ استلام البحث 2012 / 12 / 19  
 تاريخ قبول النشر 2013 / 3 / 4

( )  
 1- .Zn 50 30 10 0  
 1- .Zn 50  
 1- .Zn 60 1- .Fe 100  
 40  
 Typic Torrifuvent 2012  
 ( 30-0 ) .ARGOS  
 3/1 + 3/1 + .( 1 )  
 2 ) (2011 ) 3/1 )  
 T<sub>0</sub> 1- . 50 ( T<sub>1</sub>  
 T<sub>3</sub> 1- . 60 T<sub>2</sub> 1- . 100  
 1- . 60 + 1- . 100  
 F<sub>3</sub> F<sub>2</sub> F<sub>1</sub>  
 . 36 . 12  
 3 2 7.2 12  
 1 (1987 ) 0.8  
 25  
 20 ARGOSE ( )  
 12 25 12 - 10 2012  
 ) (1987 )  
 Zn %24 Fe %20 ( )

.1

	-	7.5	1:1 pH
	1-	4.32	EC 1:1
(1965) Black Walkley	1-	27.7	
(1954) Richards		0.9	
(1954) Richards		240	
(2007)	1-	25.6	
Pipette Method (1965) Black	1-	282.3	
	=	442.0	
	=	275.7	
	-	Loam	
(1965) Black	3-	1.54	
(1965) Black	1-	80.1	
(1982) Page		14.26	
(2007)		170	
		3.41	
		0.31	

$$\begin{matrix}
 1- & . & 100 & & T_1 & & T_0 & & 60 & & T_2 & & 1- \\
 60 & + & 1- & . & 100 & & T_3 & & 1- & . & 60 & & T_2 \\
 ( & & ) & F_1 & & & ( & & ) & F_2 & & 2012 & & 12 \\
 ( & & ) & F_3 & 2012 & & 22 & & ( & & ) & F_2 & & 2012 & & 12 \\
 & & 10 & & & & & & & & & 2012 & & 2 & & \\
 & & & & & & & & 100 & & 3 & 15 & & ( & & )
 \end{matrix}$$

2.

1-	27.15	5:1
-	6.9	pH 5:1
-	15.4	C/N
1-	11.8	
	16	
	35	
	1.09	
	0.18	

2012 28

0 70

:  
× =

$$7.2 / ( 10000 \times ) =$$

) (ANOVA )  
(

( RCBD )

.(2001) SAS

0.05

LSD

(3)

( Zn + Fe Zn Fe )

( Zn + Fe ) T<sub>3</sub>

%21.5 1- . 2.54

2.38 ) T<sub>2</sub>

1- . 2.09

T<sub>0</sub>

( 1- . 2.23 ) T<sub>1</sub>

( 1- .

%6.73



( 5 )  
 (      +      )  
 2.327 2.104  
 % 53.33 33.58 20.78  
 T<sub>0</sub>  
 1- . 2.671  
 1- . 1.742  
 F<sub>3</sub>  
 %8.48 1- . 2.291  
 1- . 2.112  
 .(      ) F<sub>1</sub>  
 .(      )

**.4**

(      )	F <sub>3</sub>	F <sub>2</sub>	F <sub>1</sub>	
72.55	73.33	68.80	75.53	(      ) T <sub>0</sub>
73.98	70.53	75.55	75.87	(      ) T <sub>1</sub>
77.20	78.90	76.67	76.05	(      ) T <sub>2</sub>
83.70	85.80	80.20	85.10	+ (      ) T <sub>3</sub> (      )
	77.14	75.30	78.13	(      )
LSD 0.05	T	F	T*F	
	3.96	3.43	6.86	

(      ) F<sub>2</sub>  
 %5.59 1- . 2.235  
 .%2.112 F<sub>2</sub>

+ T<sub>3</sub>F<sub>3</sub>

1- . 2.757  
 T<sub>3</sub>F<sub>2</sub> T<sub>3</sub>F<sub>1</sub>  
 %94.57  
 1- . 1.417 T<sub>0</sub>F<sub>2</sub>  
 .5  
 .(1- . )

( <sup>1</sup> )	F <sub>3</sub>	F <sub>2</sub>	F <sub>1</sub>	
1.742	1.903	1.417	1.905	( ) T <sub>0</sub>
2.104	2.004	2.025	2.284	( ) T <sub>1</sub>
2.327	2.502	2.429	2.051	( ) T <sub>2</sub>
2.671	2.757	2.576	2.681	( + ) T <sub>3</sub>
	2.291	2.112	2.230	( <sup>1</sup> )
LSD 0.05	T	F	T*F	
	0.134	0.116	0.233	

T<sub>3</sub> ( Fe + Zn ) ( 6 )  
 T<sub>0</sub> 1- . ( 34.48 )  
 %63.64 1- . ( 21.07 )  
 (1- . 26.96 )T<sub>1</sub> (1- . 29.11) T<sub>2</sub>  
 F<sub>3</sub> %7.97  
 ( ) (1- . 28.97)  
 F<sub>2</sub> %7.38



(1988 )  
Dehydrogenase ) ( )  
(1989 Gheith ) Peptidease Proteinase  
Protochloro pyhic  $\alpha$ . amino Laevalinic  
(2000 )

I.A.A Tryptophan  
( 1998 Cakmak )

( 2007) A-Ebadi ( 2003 ) ( 2002 ) Mahmood  
( 2011)

( )

100

<sup>1</sup>- . Zn 60 Fe

.1988.

.2003 .

.2011 .

- .2000 .  
.( ) .  
.2007 .  
.FAO  
.2009 .  
.2010 .  
) 10 *Triticum aestivum*  
.136 - 126 : ( 2  
.1987 .  
33:( 4 ) 5 .  
.37-
- A-Ebadi, A.Hassanzadeh-Gorttapeh, B. Dehdar. and H. Asadimanesh. 2007 .Evaluation of Zinc Micronutrient Effects on Yield and Some Characteristics of two potato Cultivars. www. Zinc. Crop. Org
- Amberg, A. 1987. Utiliation of organic wastes and its environmental implication. In: Agricultural waste management and environmental protection proc. 4th Int. Symp. CIEC, *Braunschweig*, 1:37-54.
- Black, C. A. 1965. Method of Soil Analysis. Panrt (1). Physical properties. Am. Soc. Agron. Inc. publisher, Madison, Wisconsin, USA.
- Cakmak, I., B. Torun, B. Erenoglu; L. Ozturk, H. Marschner. M. Kalayci. and H. Ekiz. 1998. Morophological and physiological differences in cereals in response to zinc deficiency. *Euphytica* 100 ( 1-10 ).
- Davis, J. R. 1994. The influence of cover crops on the suppression of Verticillum wilt of potato. Advances in potato pest Biology and Management St. Paul, MN:APS press.
- Gheith, E. S., A. A. Abdel-Hafith, N. A. Khalil. and A. Abdel-Shaheed. 1989. Effect of nitrogen and some micronutrents on wheat. *Anna of Agric. Sci. Moshtohor*. 20(5):255-268.
- Krylova, O. V. M.B. Lichko, N. V. Anisimov, G. E. Anisimova and K. K. Apshev. 2000. Yield and eating quality of different potato varieties *Izvestiya-Timiryazevskoi-selskokhozyais-tvennoi-Akademii.*, 2:16-27.
- Luna, J. 1993. Crop rotation and cover crops suppress nematodes in potatoes. *Pacific North west Sustainable Agriculture*, 5(1): 4-5.
- Mahmood, M. M., K. Farooq, R. Hussain and R. Sher. 2002. Comparision of different method of fertilizer (NPK) application. *Assian J.PI. Sci.*, 1:140 - 141.
- Makaraviciute, A. I. 1998. How to Grow High Yield of Potato. Minisk, Ed – *Sovremennoe Slove*, , 151 p. ( in Russian).

- Moliavko, A. A. 2001. The optimal crop rotation and fertilization systems as the main constituent of an intensive technology. No:4-12
- Page, A. L. R. H. Miller and D. R. Kenney. 1982. Methods of Soil analysis part (2). 2nd ed. Agronomy 9. Am. Soc. Agron. Madison, Wisconsin.
- Richards, L. A. 1954. Diagnosis and Improvement of Saline and Alkaline Soils. USDA. Hand book 60. USDA, Washington DC.
- Santo, G. S. 1994. Biology and management of root-knot nematodes on potato in the Pacific North West. Advances in Potato Pest Biology and Management St. Paul, MN: APS Press, , PP. 193- 201.
- SAS. 2001. User Guide Statistic (Version 6-12). SAS inst. Inst. Cary, N. C.USA.
- Wittner, S. 1999. Efficiency of foliar fertilizing. (Pub) Michigan State Univ. Michigan, USA.

## **RESPONAS OF GROWTH CHARACTERSTICS AND YIELD OF POTATO FERTILIZED WITH ORGANIC MATTER TO THE SPRAY OF FE AND ZN .**

**Jawad T. Mhmood**

\*Lecturer – Dept. Soil and Water Resources - College of Agri. – Univ. of Baghdad -  
Drjawad58@yahoo.com

### **ABSTRACT**

A Field experiment was conducted in a private field at Al- Lathyfia region ( 40 km. south Baghdad ) during spring season 2012, to study the effect of spraying of Fe ( 100 mg.l<sup>-1</sup>) and Zinc ( 60 mg.l<sup>-1</sup>) at different stages of potato growth on some vegetative growth characteristics and total tuber yield of potato fertilized with organic matter. Randomized Complete Block Design was adopted with three replications. Results showed that spray potato plants with Fe + Zn gave the highest values of plant branches ( 2.54 ), plant height ( 83.70 cm ), dry weight vegetative part ( 2.671 T.ha<sup>-1</sup>) and total tuber yield ( 34.48 T.ha<sup>-1</sup>). Spring potato plant at bulking growth stage gave highest values of plant branch ( 2.34), plant height ( 77.14 cm), dry weight part vegetative ( 2.291 T.ha<sup>-1</sup>) and total tuber yield ( 28.97 T.ha<sup>-1</sup>).

**Key words:** Growth stage, Ferrous, Zinc and potato.