



( )

( 2003 )

( IAA )  
(1998)

(1999)

(1991 )

(1999)

A                      *Solanum tuberosum* L.                      2009

) 5                      3.5

:                      (

:                      :

:                      :

Jauhari Shukla) . ( 2 - 1.5 )                      5                      -1

( 1973

( 3 ) / 5 -2  
 . ( 24 )  
 . ( Control ) (1999 ) . -3  
 .  
 -: :  
 / 5  
 (4) ( / 1 )  
 :  
 . -1  
 . ( ) -2  
 . ( 15 ) -3  
 ( 15 ) -4  
 ( 4 × 3 )  
 ( RCBD in split plot )  
 Main plot  
 . sub plot  
 1,5 2009/9/ 22  
 7.5 25 5  
 / 100 ( 18 - 45 - 0 ) NPK  
 / 50 ( )  
 (1988 )  
 .  
 :  
 :  
 . ( ) -1  
 :  

$$\frac{(T_x \times A_x) + \dots + (T_2 \times A_2) + (T_1 \times A_1)}{T_x + \dots + T_2 + T_1} = ( )$$
 -:  
 ( 1982 ) . = A  
 . = T  
 100 × \_\_\_\_\_ = (%) -2

( / ) -3

( ) -4

( / ) -5

-6

65

(1970) A.O.A.C

Flame photometer

( / ) -1

2.5

( 1995 )

( ) -2

(<sup>1-</sup> ) -3

2.5

(<sup>1-</sup> ) -4

-1

-:

65

$$100 \times \frac{\text{---}}{\text{---}} = \text{---}$$

( 1989 )

-2

$$(1970 \text{ A.O.A.C}) (182.24 - \text{---}) 0.891 + 17.55 = \% \text{---}$$

-3

Jackson) Micro-kjeldahl

( 1958

-4

:  
 $6.25 \times$  = (1970 A.O.A.C)

(1) ( 1990 )  
 LSD )

.% 5 (

. (%) ( )

(2)

%96,7 ( 23.4 )

26.8 ) ( 27.1 )

. %79.6 (

.(1990 )

) Mevalonic acid

(1977

(1975 Kriedemann Leopold )

. ( )

. ( ) ( / )

(1)

/

(3)

( / 3.2 )

/ 1.9 2.2 )

(3)

( 64.2 )

. ( 51.6 )

( 62.0 62.1 58.9 )

( 50.8 )

(1982 ) ( IAA ) ( 2 )

( 1999 ) .

## .1

	(b)	AxB	(B)	(a)	(A)		
35	18	6	3	4	2	2	
	0.210	0.413	0.114	0.099	5.454 **	0.031	
	24.133	17.066	** 256.398	16.210	** 485.890	10.990	( )
	53.259	49.888	* 194.666	31.236	140.778	184.780	/ ) (
	0.025	** 0.137	** 0.530	0.005	** 1.127	0.030	( K ) %
	0.713	0.677	0.833	1.523	5.920	1.663	/ ) (
	1845.6	3017.5	3112.6	1034.1	8238.8 *	1045.8	
	16.97	37.06	* 54.72	8.57	* 140.97	28.49	- ) ( <sup>1</sup>
	18.10	39.33	63.26 *	11.88	172.25	20.17	( <sup>1-</sup> )
	2.212	3.033	1.784	0.437	4.55 *	0.568	( %)
	1.770	2.369	1.396	0.335	3.628 *	0.423	%
	0.035	** 0.228	0.114 *	0.016	0.033	0.041	( N)%
	1.363	** 8.869	4.422 *	0.666	1.388	1.584	%

2.

( % )	( )	
79.6	26.8	
79.6	27.1	
96.7	23.4	
11.7	2.5	L.S.D. 0.05

( )

3.

المعدل	عدد السيقان الرئيسية / نبات				المعدل	طول النبات ( سم )				معاملات التغطية
	ثلاث رشات	رشتان	رشة واحدة	بدون رش		ثلاث رشات	رشتان	رشة واحدة	بدون رش	
1.9	2.1	2.2	1.6	1.8	59.5	64.5	63.0	58.3	52.2	بدون تغطية
2.2	1.9	1.9	2.7	2.3	51.6	57.2	54.1	51.1	44.2	عرق السوس
3.2	3.1	3.6	3.1	3.0	64.2	64.3	69.3	67.5	55.9	جبرلين
	N.S.					N.S.				L.S.D. 0.05
	2.4	2.6	2.5	2.4		62.0	62.1	58.9	50.8	المعدل
0.5	N.S.				7.5	6.6				L.S.D.0.05

( / )

( 1 )

(4)

( 47.2 )

( 37.1 )

( 3 )

(1)

(4)

%1.55

%31 %65



%1.45  
 %0.88    %1.21  
 %1,88  
 . %0.80  
 ( 4 3 )

47,20

(2004) (2005) /

**.4**

	K (%)									
1.18	1.17	1.42	1.11	1.00	45.8	48.6	45.0	49.3	40.3	
0.94	1.00	1.05	0.89	0.80	40.1	43.6	49.0	36.3	31.6	
1.55	1.81	1.88	1.64	0.85	46.2	47.3	47.6	50.6	39.6	
	0,95					N.S.				L.S.D. 0.05
	1.33	1.45	1.21	0.88		46.5	47.2	45.4	37.1	
0.12	0.21				N.S.	7.2				L.S.D. 0.05

(5) ( ) ( / ) -

( 149.8 ) ( 202 )

( 5 3 )

( / 1.9 )

.5

. ( )

	( )									
202.0	220.1	217.6	205.5	164.6	4.7	5.0	4.4	4.8	4.5	
171.9	231.2	173.0	162.7	120.7	4.1	3.4	4.7	4.2	4.1	
149.8	144.1	132.0	148.9	174.0	5.5	4.9	5.7	6.3	5.1	
	N.S.					N.S.				L.S.D. 0.05
	198.5	174.2	172.4	153.1		4.4	4.9	5.1	6.4	
36.4	N.S.				N.S.	N.S.				L.S.D. 0.05

(<sup>1-</sup> )  
(1)

(6)

( / 29.1 31.2 )

/ 26.5 28.2 )

( / 22.5 23.6 )

( %22.1 %22.6 )

( % 23 % 23.8 )

( 5 )  
 . ( 6 )

(1999 )

(2005 )

.6

	(1- )					(1- )				
29.1	31.9	29.5	30.9	24.0	31.2	34.2	31.8	32.9	25.8	
22.5	24.0	26.5	23.7	15.7	23.6	25.2	27.6	25.4	16.3	
26.5	22.3	26.9	28.5	28.1	28.2	24.0	28.7	30.5	29.5	
	N.S.					N.S.				L.S.D. 0.05
	26.1	27.6	27.7	22.6		27.8	29.4	29.6	23.9	
3.3	4.1				3.9	4.2				L.S.D. 0.05

. ( % )

(1)

(7)

%16.1 )

( %10.3

( %9.3 %14.9 )

( 2 )

(1990 Byers)

(1) . ( % )  
( )

(8)

( %17.1 %2.7 )  
( %15.4 %2.4 )

( %14.6 %2.3 ) ( %19.3 %3.1 )  
( )

(2005 ) / ( 47.20 21.26 20.23 )  
Mg

(2010)

/ 2.5 MS ( )  
b a

100 / ( 3.19 1.07 2.12 )

( ) (4 )  
( )

## .7

10.1	10.1	9.1	11.2	10.1	15.8	15.8	14.6	17.1	15.5	
10.3	10.3	11.5	10.1	9.4	16.1	16.0	17.4	15.8	15.1	
9.3	8.8	8.6	10.2	9.5	14.9	14.3	14.2	15.9	15.2	
	N.S.					N.S.				L.S.D. 0.05
	9.7	9.7	10.5	9.7		15.4	15.4	16.3	15.3	
0.6	N.S.				0.7	N.S.				L.S.D. 0.05

## .8

	( % )					N ( % )				
16.1	16.1	14.6	18.3	15.3	2.6	2.6	2.3	2.9	2.4	
16.1	17.5	14.6	16.4	15.8	2.6	2.8	2.3	2.6	2.5	
16.7	15.6	19.3	16.6	15.2	2.7	2.5	3.1	2.7	2.4	
	2,7					0.4				L.S.D. 0.05
	16.4	16.2	17.1	15.4		2.6	2.6	2.7	2.4	
N.S.	1.1				N.S.	0.1				L.S.D. 0.05

. 1998 .

. 134 -

. 1995 .

- . 1977 .
- . 1989 .
- GA<sub>3</sub> . 2005 .
- Glycyrrhiza glabra*
- . 2004 .
- (2) 2: .165-154.
- .1988.
- . *Solanum tuberosum* L.
- (CIPC) . 2003 .
- Solanum* ( *tuberosum* L.)
- .1999.
- ( *Auimum cepa* L. )
- . 1990 .
- . 2010 .
- ( *Phoenix dactylifera* L. ) MS
- 36) ( ) B. ( 6 ) ( )
- ) 1990 . . ( )
- . 1982 .
- . 256 .
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## EFFECT OF THE TREATMENT BY GIBBERELIC ACID AND LIQUORICE EXTRACT ON GROWTH AND YIELD OF POTATO .

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### ABSTRACT

Bureen cultivar of potato class A was planted during Autumn season 2009 , in loam soil at the right bank of Euphrates in Ramadi ,to study the effect of soaking tubers before planting in Gibberellic acid 5ppm and liquorice extract 5g/l on promoting sprouting . In addition , the effect of once ,twice or thrice foliar application of liquorice extract 5g/l on vegetative growth and yield of potato was studied and compared with untreated control plants . Randomized complete block design RCBD arranged in split-plot with three replicates for each treatment was adapted . Gibberellic acid significantly hastened field emergence of sprouts and gave the best germination percentage . higher means of plant length , stems number per plant , potassium content in leaves were found when potato tubers were soaked in gibberellic acid . Soaking in liquorice extract , increased drymatter and starch in tubers. Soaking treatments had no significant effect on vegetative dry weight , tubers number per plant and nitrogen and protein percentages in tubers . Foliar application of liquorice extract significantly increased plant length , dry weight of plant , potassium content in leaves ,and nitrogen and protein percentages in tubers . In addition , it gave higher means of total and marketable yield for all treatments compared with control . Foliar application had no significant effect on stems/plant , marketable tubers/plant , tuber mean weight and percentages of dry matter and starch in tubers during growth season . The inter action between treatments was significantly only for potassium content in leaves and nitrogen and protein percentages in tubers .

**Key words:** potato , GA , liquorice .