

*
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2011-2010

	Thomas Laxton	Mammoth Melting	Petit Provencal	Spring
"Kelp40"	2134.80	1928.20	3021.92	8.153
2881.48		Mammoth Melting		
Kelp40				
%25.34	TSS	%15.51		
%0.492	%4.047	%15.51		8.153
	%0.020	%0.504	%1.365	%2.955

Kelp40

Fabaceae

Pisum sativum L.

Vance)

(2000

A

/ 1648

(2004) FAO

(2002)

) / 400

(500) 2005

(2006

(2002)

تاريخ استلام البحث 2012 / 11 / 18
تاريخ قبول النشر 2013 / 1 / 13

Crouch)
 (2005 Vanstaden
 (1996) Trumble Rietiz .(1975 Abou Hussein)
Ascophyllum nodosum
 Little (2012) .
 / 2 1 Marvel
 (2000) Saied Sheekh .

Mammoth (M.M.) Spring "Kelp40"
 Petit Provencal(P.P.) Thomas laxton (T.L.) Melting
 /

: 2011-2010
 Petit Provencal Spring /
 Thomas laxton Mammoth Melting
 (M.M.) /
 Petit Provencal Spring
 Thomas laxton
 .(2007 2006 Ali 2002)
 2010/11/17 25 0.75 4
 : / 2 "Kelp40"
 Agrichem) 5-3
 3 ×4 ×3 .(
 Spring) ()
 . (Thomas laxton Mammoth Melting Petit Provencal
 .(1) .(RCBD)
 .(2)

(SPAD) /
Menolta Model Spad 502 (Chlorophyll Meter)

.1

91.00	73.00	(ppm)
43.00	32.00	(ppm)
291.00	279.00	(ppm)
7.1	6.8	pH
1.20	1.11	Ec (Ms)
33.62	46.12	Sand (%)
35.00	30.00	Silt (%)
31.37	23.87	Clay (%)
Clay loam	Loam	Texture

.2

*

2011/2010

	(%)	(%)	()	()		
7.3	4.30	44.0	24.75	32.2	17.3	2010
8.8	2.25	56.0	16.6	26.8	6.4	
6.0	2.04	70.0	11.3	18.5	4.1	
4.7	1.0	84.0	8.15	13.2	3.1	
5.9	1.9	72.0	9.45	14.7	4.2	2011
7.8	3.5	56.0	13.55	20.3	6.8	
6.7	4.8	59.0	18.95	25.6	12.3	
8.6	6.5	51.0	26.40	31.8	21.0	
11.5	10.7	31.0	31.00	39.3	22.7	

*

/

= : (/) :
(/) 6.25×
(%) (2000) Galiba Kerepesi
(Hand Refractometer)

(%) Fe (%) Mg (%) Ca (%) K (%) P (%)N :

Spectrophotometer
(1999) Bhargava
Atomic Absorption

Flame photometer

Raghupthi
.GBC933 Spectrophotometer

) 0.05
 Mg (%)0.03 Ca
 Kelp40 .(2000
 Agrichem (%)0.005 Fe (%)0.008
 . (2005 potter)
 "Kelp40" (3)
 89.10)
 102.24 / 6.778 57.80) (SPAD 55.50 / 5.766
 (SPAD
 (2006 Wright Gallon)
 (2003 Amar)
 . (2005 Potter)
 (M.M.)
 141.00)
 9.270 161.91) (SPAD 56.57 / 7.998
 . Spring (SPAD 57.83 /
 (1996) Negornovic (1989) Temple
 .(2001)
 (4)
 6.212 / 35.33)
 / 6.901 / 43.13) (
 (/ 1928.20 /
 / 2134.80
 (6) (3)
 . (2005) El-Beheidi

جدول 3. استجابة أصناف البزاليا للرش بالمستخلص البكري (Kelp40) وتأثيراته في صفات النمو الخضري للموسم الزراعي 2010/2011 * .

الصلحية			الرشدية			الرش	الصف
الكوروفيل (وحدة SPAD)	عدد الأفرع/نبات	طول الساق (سم)	الكوروفيل (وحدة SPAD)	عدد الأفرع/نبات	طول الساق (سم)		
50.00 h	2.810 g	57.33 i	49.00 f	2.270 i	34.00 i	بنون رش	Spring P.P. M.M. T.L.
54.00 ef	6.717 cd	92.65 e	51.00 e	5.037 e	57.49 g		
56.00 cd	8.747 b	159.74 c	54.70 c	7.670 b	116.77 b		
53.00 fg	4.702 f	76.97 g	52.97 d	3.610 g	61.93 ef		
52.25 g	3.122 g	62.96 h	50.25 ef	2.338 i	52.00 h	مرة	Spring P.P. M.M. T.L.
56.90 bc	6.912 c	97.63 d	54.00 cd	6.000 d	59.33 fg		
58.00 b	8.915 b	161.57 b	57.00 ab	7.838 b	153.33 a		
54.90 de	5.120 ef	81.62 f	53.00 d	3.828 g	71.50 c		
56.83 bc	3.540 g	63.98 h	53.50 cd	3.048 h	63.47 e	مرتين	Spring P.P. M.M. T.L.
57.98 b	7.430 c	98.31 d	56.49 b	7.077 c	68.00 d		
59.50 a	10.14 a	164.41 a	58.00 a	8.838 a	152.91 a		
56.90 bc	6.000 de	82.27 f	54.00 cd	4.455 f	72.04 c		
53.25 c	5.744 b	96.67 c	51.84 c	4.647 c	67.54 c	بنون رش	Spring P.P. M.M. T.L.
55.51 b	6.068 b	100.95 b	53.56 b	5.001 b	84.04 b		
57.80 a	6.778 a	102.24 a	55.50 a	5.766 a	89.10 a	مرتين	Spring P.P. M.M. T.L.
53.03 d	3.155 d	61.42 d	50.92 c	2.552 d	49.82 d		
56.30 b	7.090 b	96.11 b	53.83 b	6.038 b	61.60 c	مرتين	Spring P.P. M.M. T.L.
57.83 a	9.270 a	161.91 a	56.57 a	7.998 a	141.00 a		
54.93 c	5.270 c	80.29 c	53.23 b	3.964 c	68.49 b		

* المتوسطات التي تشترك بنفس الحرف الأبجدي لا تختلف عن بعضها مغزياً حسب اختبار دنكن متعدد الحدود عند مستوى احتمال 0.05 .

جدول 4. استجابة أصناف البرايا للرش بالمستخلص البحري (Kelp40) وتأثيراته في الحاصل ومكوناته للموسم الزراعي 2010/2011 * .

الصلحية			الرشيدية			الصف	الرش
حاصل البذور الجافة (كغم/هـ)	عدد البذور في القرنة	عدد القرنات/نبات	حاصل البذور الجافة(كغم/هـ)	عدد البذور في القرنة	عدد القرنات/نبات		
991.64 g	5.741 g	22.70 f	800.00 ij	6.540 ab	10.22 g	Spring	بوزن رش
1973.80 d	6.474 ed	40.85 d	1998.56 e	5.600 f	40.30 c	P.P.	
2830.88 b	6.875 bc	45.40 c	3200.00 a	6.550 ab	44.00 a	M.M.	
1717.48 e	5.984 fg	39.98 d	1200.40 h	6.160 cd	16.50 f	T.L.	
1090.88 fg	6.209 ef	26.74 e	742.92 j	5.150 h	17.08 f	Spring	مرة
2007.00 cd	6.635 cd	45.49 c	2284.56 d	5.870 e	41.00 bc	P.P.	
3011.28 b	7.030 b	50.40 b	2622.60 c	6.000 de	41.64 bc	M.M.	
1749.68 e	6.384 ed	44.56 c	1433.32 g	5.415 fg	34.64 d	T.L.	
1191.44 f	6.386 ed	28.08 e	941.48 i	5.306 gh	22.28 e	Spring	مرتين
2174.24 c	7.095 b	45.91 c	2315.88 d	6.730 a	42.33 b	P.P.	
3223.56 a	7.670 a	53.21 a	2821.88 b	6.375 bc	41.78 bc	M.M.	
1949.88 d	6.489 ed	45.35 c	1601.48 f	5.474 fg	34.94 d	T.L.	
1878.44 b	6.268 c	37.23 b	1770.84 b	5.609 c	27.76 c		بوزن رش مرة مرتين
1964.76 b	6.564 b	41.71 a	1799.76 b	5.971 b	33.59 b		
2134.80 a	6.901 a	43.13 a	1928.20 a	6.212 a	35.33 a		
1091.40 d	6.112 c	25.84 c	828.12 d	5.666 c	16.53 d	Spring	
2051.68 b	6.722 b	44.08 b	2199.68 b	6.066 b	41.21 b	P.P.	
3021.92 a	7.191 a	49.67 a	2881.48 a	6.308 a	42.47 a	M.M.	
1805.68 c	6.285 c	43.29 b	1422.40 c	5.683 c	28.69 c	T.L.	

* المتوسطات التي تشترك بنفس الحرف الأبجدي لا تختلف عن بعضها معنوياً حسب اختبار دنكن متعدد الحدود عند مستوى احتمال 0.05 .

(M.M.)
 7.191 49.67 2881.48 6.308 42.47 / 3021.92
 Spring (/)

. (1994 Eteve Domuline)

.(1991) Walton

(5)

%15.51 %8.153 %25.34 %14.506 %7.437 %25.08 (TSS)

2003 O'Dell) (3)
 TSS .(2004) Jenson (

(T.L.) .(1988)

%26.51 %25.75

(2006) Ali (M.M.)

%35-15 . (2007)

.(2002)

(M.M)

جدول 5. استجابة أصناف البرايا للرش بالمستخلص البحري (Kelp40) وتأثيراته في الصفات النوعية للموسم الزراعي 2010/2011 * .

الصلحية		الرشدية			الرش	الصف
(%)TSS	الكاربوهيدرات مايكروغرام/غم وزن جاف	(%) البروتين	(%) TSS	الكاربوهيدرات مايكروغرام/غم وزن جاف		
14.61 f	6.056 f	24.12 de	12.56 h	5.224 h	23.58 def	هبون رش
15.03 e	7.600 d	23.21 ef	14.20 e	6.704 def	22.56 ghf	
15.29 c	8.24 c	22.27 f	15.73 a	7.409 bcd	21.59 h	
15.01 e	7.101 e	25.62 abed	13.50 g	6.317 fg	24.94 bc	
14.61 f	6.930 e	25.46 bcd	13.77 f	5.871 gh	24.17 cde	مرة
14.76 e	8.101 c	24.40 cde	14.86 c	7.132 cde	23.20 efg	
15.26 cd	8.530 b	22.88 ef	14.52 d	7.998 ab	22.14 gh	
15.27 cd	7.540 d	26.70 ab	14.12 e	6.778 cdef	25.36 bc	
15.13 de	7.430 d	26.03 abc	13.95 ef	6.540 efg	25.75 b	مرتين
15.58 b	8.160 c	24.96 cd	15.36 b	7.501 bc	24.69 bcd	
15.79 a	9.030 a	23.16 ef	14.63 cd	8.524 a	22.91 efg	
15.53 b	7.990 c	27.21 a	14.05 e	7.182 cde	26.97 a	
14.99 c	7.249 c	23.81 b	13.99 c	6.414 c	23.17 b	هبون رش مرة
15.06 b	7.775 b	24.86 a	14.31 b	6.495 b	23.72 b	
15.51 a	8.153 a	25.34 a	14.50 a	7.437 a	25.08 a	
14.78 c	6.806 d	25.26 b	13.43 d	5.878 c	24.50 a	
15.24 b	7.954 b	24.19 c	14.81 b	7.112 b	23.48 c	هبون رش مرتين
15.45 a	8.600 a	22.77 d	14.96 a	7.977 a	22.21 d	
15.27 b	7.543 c	26.51 a	13.89 c	6.759 b	25.75 a	

* المتوسطات التي تشترك بنفس الحرف الأبجدي لا تختلف عن بعضها معنوياً حسب اختبار دنكان متعدد الحدود عند مستوى احتمال 0.05.

(M.M.)											
Spring											
% 8.600 % 7.977											
El- Beheidi											
.(2005)											
(M.M.)											
Spring											
(%15.45											
TSS											
. (2007											
1988)											
(6)											
Fe	Mg	Ca	K	P	N	(%)					
% 0.019	0.337	0.352	2.924	0.470	4.012						
						% 0.020	0.504	1.365	2.955	0.492	4.047
. (2009)											
. (1998)											
Rayorath)											
. (2008											
. (M.M.)											
%4.120											
%0.018 %0.343 %0.430 %2.608 %0.466											
%1.723 %2.833 %0.495 %4.228											
. %0.022 %0.507											

جدول 5. استجابة أصناف البزاليا للرش بالمستخلص البحري (Kelp40) وتأثيراته في الصفات النوعية للموسم الزراعي 2010/2011 * .

TSS (%)	الصلحية		الرشحية		TSS (%)	الكاربوهيدرات مايكروغرام/غم وزن جاف	البروتين (%)	الرشحية		البروتين (%)	الصف	الرش
	الكاربوهيدرات مايكروغرام/غم وزن جاف	البروتين (%)	الرشحية	البروتين (%)								
14.61 f	6.056 f	24.12 de	12.56 h	5.224 h	23.58 def	Spring	بدون رش					
15.03 e	7.600 d	23.21 ef	14.20 e	6.704 def	22.56 ghf	P.P.						
15.29 c	8.24 c	22.27 f	15.73 a	7.409 bcd	21.59 h	M.M.						
15.01 e	7.101 e	25.62 abed	13.50 g	6.317 fg	24.94 bc	T.L.						
14.61 f	6.930 e	25.46 bcd	13.77 f	5.871 gh	24.17 cde	Spring	مرة					
14.76 e	8.101 c	24.40 cde	14.86 c	7.132 cde	23.20 efg	P.P.						
15.26 cd	8.530 b	22.88 ef	14.52 d	7.998 ab	22.14 gh	M.M.						
15.27 cd	7.540 d	26.70 ab	14.12 e	6.778 cdef	25.36 bc	T.L.						
15.13 de	7.430 d	26.03 abc	13.95 ef	6.540 efg	25.75 b	Spring	مرتين					
15.58 b	8.160 c	24.96 cd	15.36 b	7.501 bc	24.69 bcd	P.P.						
15.79 a	9.030 a	23.16 ef	14.63 cd	8.524 a	22.91 efg	M.M.						
15.53 b	7.990 c	27.21 a	14.05 e	7.182 cde	26.97 a	T.L.						
14.99 c	7.249 c	23.81 b	13.99 c	6.414 c	23.17 b		بدون رش					
15.06 b	7.775 b	24.86 a	14.31 b	6.495 b	23.72 b		مرة					
15.51 a	8.153 a	25.34 a	14.50 a	7.437 a	25.08 a		مرتين					
14.78 c	6.806 d	25.26 b	13.43 d	5.878 c	24.50 a	Spring						
15.24 b	7.954 b	24.19 c	14.81 b	7.112 b	23.48 c	P.P.						
15.45 a	8.600 a	22.77 d	14.96 a	7.977 a	22.21 d	M.M.						
15.27 b	7.543 c	26.51 a	13.89 c	6.759 b	25.75 a	T.L.						

*المؤسجات التي تشترك بنفس الحرف الأبجدي لا تختلف عن بعضها معنوياً حسب اختبار دنكان متعدد الحدود عند مستوى احتمال 0.05.

تابع جدول 6. استجابة أصناف البزاليا للرش بالمستخلص البحري Kelp40 وتأثيراته في المحتوى المعدني للذور للموسم الزراعي 2011/2010.*

Fe%	الصالحية						الرش	الصف
	Mg%	Ca%	K%	P%	N%			
0.017 e	0.320 g	0.793 k	2.420 g	0.400 g	3.860 f	بدون رش	Spring	
0.020 bcd	0.380 ef	1.177 f	2.084 h	0.382 i	3.715 g		P.P.	
0.021 abc	0.460 bcd	1.478 c	1.937 i	0.294 j	3.564 I		M.M.	
0.016 e	0.340 fg	0.812 j	2.400 g	0.437 e	4.088 d		T.L.	
0.018 de	0.420 de	0.802 jk	2.895 c	0.455 d	4.075 d	مرة	Spring	
0.021 abc	0.500 ab	1.395 e	2.818 e	0.438 e	3.905 f		P.P.	
0.022 ab	0.523 a	1.779 b	2.709 f	0.388 h	3.622 h		M.M.	
0.018 de	0.440 cd	1.052 h	2.990 b	0.511 b	4.272 b		T.L.	
0.019 cd	0.460 bcd	1.027 i	2.970 b	0.511 b	4.165 c	مرتين	Spring	
0.022 ab	0.537 a	1.445 d	2.897 c	0.490 c	3.995 e		P.P.	
0.023 a	0.540 a	1.913 a	2.843 d	0.431 f	3.707 g		M.M.	
0.018 de	0.480 bc	1.077 g	3.107 a	0.539 a	4.323 a		T.L.	
0.018 b	0.375 c	1.065 c	2.210 c	0.378 c	3.806 c	بدون رش		
0.019 a	0.470 b	1.257 b	2.853 b	0.448 b	3.986 b	مرة		
0.020	0.504 a	1.365 a	2.955 a	0.492 a	4.047 a	مرتين		
0.018 b	0.400 c	0.874 d	2.761 b	0.455 b	4.033 b		Spring	
0.021 a	0.472 b	1.339 b	2.599 c	0.436 c	3.871 c		P.P.	
0.022 a	0.507 a	1.723 a	2.833 a	0.495 a	4.228 a		M.M.	
0.017 b	0.420 c	0.980 c	2.496 d	0.371 d	3.631 d		T.L.	

*المستويات التي تشارك بنفس الحرف الأبجدي لا تختلف عن بعضها معنوياً حسب اختبار دكنز متعدد الحدود عند مستوى احتمال 0.05.

(Middle Lamell)

(1987)

(B Mn Cl Na K)

(Phytin)
(IAA)
(CO₂)

(1988)

%2.7

(1987)

ATP

(K-Na-ATPase)

(Cytochromes)
RNA

(1988)

%80

Ferredoxin

(1987) Nitrogenase Nitrate reductase

(1)

/ 2 (Kelp40)

(M.M.)

(Kelp40)

. 1988 .

. 2000.

.2012.

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. 34-26 : (2) 40

(*Pisum sativm* L.)

. 2009.

(*Ramarinus officinalis* L.)

.7-1 .

. 1998 .

.22 .

. 2006 .

. 1987 .

.2002.

.1988 .

.2007 .

.127-120 .

.2001 .

: (1) 2 .

. 6-3 .

. 2002 .

.20-16 : (3) 7 .

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RESPONSE OF PEA CULTIVARS TO SPRAYING WITH SEAWEED EXTRACTS .

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ABSTRACT

A field experiment was conducted in the growing season 2010/2011 in two different districts : Al-Rashidya and Al-Salihya/Ninevah , to study the effect of spraying seaweed extract "kelp 40" at 2ml/l , (0, once and twice) on four pea cultivars namely : Spring , Petit Provencal, Mammoth Melting and Thomas Laxton. Results indicated that "kelp 40" affected significantly stem length , No. branches/plant, chlorophyll content, pods/plant, seeds/pod, dry seeds yield, some seeds quality parameters and seeds mineral content in the two districts. Results also showed that twice foliar applications with 2ml/l of kelp40 gave the highest dry seed yield 1928.30 , 2134.80 kg/ha in the two districts respectively. Mammoth Melting cultivar gave the highest dry seeds yield 2881.48, 3021.92kg/ha , in Al-Rashidya and Salihya districts respectively. Results indicated that spraying twice with kelp 40 gave the highest value in the protein, carbohydrate and TSS in Salihya district , 25.08% , 7.437 Microgram/gm dry weight and 14.50% respectively as compared with Rashidya district . Also the same treatment gave highest value of mineral concentrations as follow: 4.012% N, 0.470% P, 2.924%K, 0.352%Ca, 0.337%Mg, and 0.019%Fe as compared with Al-Rashidya district. Generally plants grown in Al-Salihya district gave higher mean values of studied characteristics than those grown in Al-Rashidya district.

Key words: Seaweed extracts , Kelp40, Foliar fertilization, Pea, Cultivars .