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EFFECT OF POTASSIUM FERTILIZATION ON THE GROWTH, YIELD AND QUALITY OF SOME SWEET POTATO CULTIVARS

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ABSTRACT: *Two field experiments were carried out during the two successive summer seasons of 2013 and 2014 in the Horticultural Research Station Al-Qanater El-Khairia, El-Kaluobia Governorate, Egypt to investigate the effect of four rates of potassium fertilization i.e., 0, 50, 75 and 100 % of the recommended does for sweet potato on the growth, yield and its components and qualities of some new sweet potato cultivars (Minufiya 2, 4 and 6) and check cultivar (Mabrouka). Significant differences were observed among potassium fertilization rates and cultivars and also for interactions (fertilizer x cultivars) on most of the studied characteristics.*

The cultivar Minufiya 6 had the highest values of total marketable yield of tuber roots as well as weights of tuber root and dry matter, while, Minufiya 2 cultivar had the highest value of tuber roots number per plant. The results also showed that growth characters of all used cultivars were significantly increased as raising the rate of potassium fertilization. Respect to quality characters sweet potato, there were no significant differences between the two rates of K 75 and 100 % for some traits such as percentage of dry weight root and total carbohydrates while, significantly increases were observed with increasing K rates in other traits such as sugars, carotene, vitamin C and protein. N content increases with increasing the rate of K from 75 to 100 % for all the used cultivars except Minufiya 2 cv. where was nosignificant difference between 75 and 100 % rates of K, values of P and K content where also similar at 75 and 100 % rates of K, while the uptake for NPK by tuber roots was significantly increased with increasing K rates for all cultivars under study.

Accordingly, application of K fertilization 75% from the recommended dose of sweet potato is the recommended treatment at a rate of K 100% (96Kg K_2O) for raising the productivity as well as improving tuber root quality and some mineral contents of new sweet potato cultivars compared with a check cultivar Mabrouka.

Key words: *Sweet potato, potassium fertilizer rates, cultivar,uptake,*

INTRODUCTION

Sweet potato is a major staple food in Africa, Asia, the Caribbean and South America where it is an important and not expensive source of carbohydrates, vitamins A and C, fiber, iron, potassium and protein (Woolfe, 1992). In the developing countries, sweet potato is especially valued because it is highly adoptable and tolerates high temperatures, low soil fertility and drought (Yamakawa and Yoshimoto, 2002).

Potassium is very important nutrient in sweet potato production, as it influences cell division tuberous root initiation and thickening, photosynthesis, formation of carbohydrates and translocation of sugars, mineral nutrients and photosynthetic matters and it influences also enzyme activity (Saurbeck and Helal, 1990). In this contex, Chakrabarty *et al*., (1993) declared that potassium application increased tuber dry matter. Moreover, Njoku *et al*., (2002) reported that the addition of 100 kg K fertilizer /ha had positive effect on yield and growth characteristics. John *et al*., (2004) also reported that there was constant and progressive increasing in stem length, number of leaves, as well as, the fresh and dry weight of whole plant by increasing the rate of K_2O up to the highest one, i.e., 140 kg K_2O/ha. Brito *et al*., (2006) reported that tuber root yield character was increased up to 148 kg K_2O/ha with increasing potassium fertilizer up to 194 kg K_2O/ha. In addition, Yao (2007) showed that applying of K_2O at rates of 168 kg/ha in summer and 200 kg/ha on autumn increased yield of sweet potato by 26.4 %. Suresh and Ramanathan (2001) also, declared that tuber yield of sweet potato increased with increasing the level of potassium fertilizer up to 90 kg/ha. Haque *et al*., (2001), also studied the pattern of nutrient uptake and productivity of sweet potato under the addition of 0, 40, 80 and 120 kg K_2O/ha. They claimed that tuber, K uptake increased almost linearly with K application in the range of the used level. Patil *et al*., (2006) mentioned that increasing K fertilizer to sweet potato plants increased N and K contents in tuber root. However, P content was not affected.

Therefore, the aim of this study was to answer the question. Which a level of potassium is suitable for given cultivars of sweet potato?

MATERIALS AND METHODS

The present investigation was carried out at the experimental farm of Hort. Res. Station, El-Kanater El-Khyria, Kaluobia Governorate, Egypt during the summer season of 2013 and 2014. The cultivars used in this study were Minufiya 2, 4 and 6 and chick cv. Mabourka were provided by potatoes and vegetative crops reproduction Department, Horticultural Res. Institute). The levels of potassium 0, 50, 75 and 100 % (200Kg potassium sulphate) from the recommended dose of Ministry of Agriculture.

The transplanting was done on May in both seasons. Stem cuttings of 25 cm length were planted in rows 70 cm apart, and at spacing of 25 cm within rows. The treatments were arranged in split plot design with three replicates. The cultivars were arranged in the main plots, while the rates of potassium fertilizer were plotted randomly in the sub-plots. The area of the experimental unit (sub plot) was 11.2 m^2 (including 4 rows with 0.70 cm in width and 4 m in length). Potassium fertilizer (potassium sulphate 48 % K_2O) was added to the soil after a month and two monthes from planting. Calcium super phosphate (15.5 % P_2O_5) was applied at a rate of 45 kg P_2O_5/fed during soil preparation. However, nitrogen fertilizer (ammonium sulphate 20.6 %) was added at 40 kg N/fed. and irrigation was practiced as used with commercial production of sweet potato.

III- Soil analysis:

Representative soil samples were taken before sowing and prepared for determining the physical and chemical properties as shown in Table (1).

The studied traits were:length of plant, number of branches and leaves/plant, fresh and dry weight/plant, total marketable yield, weight and number tuber roots/plant, tuber roots length and diameter, dry weight of root, carbohydrate, sugars, carotein, vitamin c and protein as well as NPK contents and its uptake by tuber roots.

1- Plant characters:

The plant samples were randomly collected from each sub plot after 105 days from planting in both seasons for determining of the vegetative growth characters (number of branches/plant, stem length (cm) "from ground level to the terminal bud of longest vegetative, number of leaves on main stem, foliage fresh weight (gm.) and foliage dry weight (gm.). The tuber roots of every plots were harvested and the obtained data were recorded after 150 days from transplanting for the two studied seasons.

2- Yield and its components:

Total yield of tuber roots (ton/fed.), average number of tuber roots/plant, average weight of tuber root (gm.), average length and diameter of tuber root (cm.) were determined. Dry matter for tuber roots percentage was estimated at time after curing. One hundred gms of shredded fresh weight sample were oven dried at 70 °C.

3- Chemical characters:

Total nitrogen, phosphorus and potassium contents in tuber roots were determined according to Chapman and Pratt (1973); protein content was also estimated by multiplying the nitrogen content by 6.25 as described by Murphy and Riely (1962). Total carbohydrate content in tuber roots was determined according to the method described by Smith *et al*., (1956). Total sugars content was determined in dry matter material according to Mcillory (1948) Cartonenoid and Vitamin C according to A.O.A.C (1990).

Table (1): Physical and chemical analysis of the investigated soil samples.

Season	**2013**	**2014**
1- physical analysis :		
Find sand (%)	18.42	20.27
Silt (%)	31.24	27.62
Clay (%)	50.34	52.11
Soil texture	Clay	Clay
Organic matter (%)	1.67	1.71
II- Chemical analysis :		
pH (1 soil: 2.5 water suspension)	7.58	7.67
EC (dS/m, 1 soil : 5 water extract)	0.67	0.72
Soluble ions (meq/ l)		
1- Cations:		
Ca++	1.18	1.38
Mg++	0.91	1.11
Na+	4.35	4.26
K+	0.32	0.47
2- Anions :		
CO3--	-	-
HCO3--	0.98	1.11
Cl-	3.93	3.84
SO4--	1.79	2.15
Available nutrients (ppm):		
1- Macronutrients :		
N (1 % Potassium sulphate extract)	35.21	36.12
P (0.5 M sodium bicarbonate extract)	8.20	8.11
K (1 M ammonium acetate extract)	344	352

4- Statistical analysis:

The obtained results were statistically analyzed and least significant difference (L.S.D at 0.05 level) was used to compare the means of treatments as reported by Gommez and Gommez (1984).

RESULTS AND DISCUSSION

1- Effect of potassium fertilization rates and sweetpotato cultivars on vegetative growth:-

Data presented in Table (2) showed that the application of K- fertilization rates for sweetpotato cultivars caused significantly increases in all the studied traits. The cv. Minufiya 6 had the highest for the most vegetative growth traits studied; however, cv. Minufiya 2 had the lowest values in this respect. The different rates of K used in the present experiment caused significant increases which were gradually related with the rate of applied K.

With respect to the interaction between cultivars and potassium fertilizer rates, data shown in Table (2) revealed that the most studied characters for all cultivars namely (length of main stem, number of branches and leaves per plant fresh (Kg) and dry weight (g) per plant) were significantly increased with increasing the rate of K up to 100 % from the recommended dose.

Table (2): Effect of potassium fertilization rates and sweetpotato cultivars on vegetative growth (combined analysis of 2013 and 2014 seasons).

Treatment		Length of plant	Number		Weigh/plant	
Cultivars (A)	K-Fertilizer rates (B)		Branches/plant	Leaves on Main stem	Fresh (kg)	Dry (g.)
Minfuia 2	0	55.00	8.00	19.00	1.20	118.15
	50	70.00	13.00	23.00	1.32	134.67
	75	88.00	19.00	29.00	1.51	172.80
	100	92.00	21.00	32.00	1.58	186.78
Mean (A)		76.25	15.25	25.75	1.40	152.30
Minfuia 4	0	142.00	7.00	18.00	1.50	136.55
	50	153.00	11.00	22.00	1.70	164.24
	75	176.00	16.00	28.00	2.00	198.32
	100	180.00	17.00	30.00	2.10	210.76
Mean (A)		162.80	12.75	24.50	1.83	177.50
Minfuia 6	0	207.00	8.00	26.00	2.00	211.18
	50	223.00	12.00	38.00	2.30	256.16
	75	275.00	16.00	51.00	2.53	287.94
	100	280.00	18.00	54.00	2.60	298.21
Mean (A)		246.30	13.5	42.25	2.36	263.40
Mabrouka	0	142.00	7.00	24.00	1.33	132.47
	50	160.00	11.00	30.00	1.51	155.67
	75	186.00	15.00	35.00	1.74	183.11
	100	190.00	17.00	38.00	1.80	192.27
Mean (A)		169.50	12.5	31.75	1.60	165.90
Mean (B)	0	136.50	7.5	21.75	1.51	148.80
	50	151.50	11.75	28.25	1.71	177.70
	75	181.30	16.5	35.75	1.95	210.50
	100	185.50	18.25	38.50	1.02	222
LSD at 0.50 level	A	2.140	0.397	0.568	0.119	2.256
	B	2.140	0.397	0.568	0.119	2.256
	AB	4.281	0.795	1.137	0.238	4.512

These results could be explained on the basis of that potassium seemed to be the prevalent cation in the plant and might be involved in maintenance of ionic balance in the cells and it bounded ironically to the enzyme pururotekinase, which is essential in respiration and carbohydrates metabolism. These results seemed to be in agreement with those reported by John *et al*., (2004), Shalaby *et al*., (2001) and Khalil (2004).

2- Effect of potassium fertilization rates and sweet potato cultivars on the yield and its components:

Data in Table (3) show the effect of different levels of K on sweet potato cultivars yields (ton/fed.) and its components (Average weight of tuber roots and number of tuber roots per plant and average of length and diameter of tuber roots (cm). It is clear that yield and its components increased by raising the level of potassium applied to the soil up to 100 % of the recommended dose. There were also clear differences between the yields of the cultivars under study on yield and their components. The highly significant positive effect was observed with increasing the rate of potassium. The highest value of total yields/fed and their components for all cultivars were attained with the K rates of 75 and 100 %.

Table (3): Effect of potassium fertilization rates and sweetpotato cultivars on the yield and its component (combined analysis of 2013 and 2014 seasons)

Treatment		Total marketable yield (ton/fed.)	Average/plant		Average weight of tuber root (g.)	Average of tuber roots(cm.)	
Cultivars (A)	K-Fertilizer rates (B)		Weight of tuber roots (g.)	No. of tuber roots		Length	Diameter
Minfuia 2	**0**	11.6	620	3.00	102	8.00	2.90
	50	15.4	810	4.30	200	10.70	3.80
	75	18.85	951	5.90	288	12.90	4.60
	100	19.25	962	6.20	300	13.40	4.80
Mean (A)		**16.27**	**835.8**	**4.87**	**222.5**	**11.25**	**4.03**
Minfuia 4	**0**	9.32	417	2.60	97	14.30	2.80
	50	12	622	4.00	135	16.80	4.00
	75	14.9	748	5.00	207	18.40	5.00
	100	15.23	760	5.10	220	18.60	5.30
Mean (A)		**12.86**	**636.8**	**4.18**	**164.8**	**17.02**	**4.28**
Minfuia 6	**0**	15.22	821	2.11	200	17.00	3.90
	50	18.1	988	3.76	300	19.50	5.00
	75	21.8	1100	4.81	397	22.00	6.30
	100	22.35	1117	4.90	412	22.30	6.80
Mean (A)		**19.37**	**1006.5**	**3.90**	**327.3**	**20.20**	**5.50**
Mabrouka	**0**	8	400	2.00	193	13.60	2.80
	50	10.2	502	2.32	280	15.40	5.00
	75	12	617	3.10	244	17.00	6.10
	100	12.55	630	3.20	360	17.20	6.40
Mean (A)		**10.69**	**537.3**	**2.66**	**269.3**	**15.80**	**5.08**
Mean (B)	**0**	11.03	564.5	2.43	148	13.23	3.10
	50	13.93	730.5	3.60	228.8	15.60	4.45
	75	16.89	854.0	4.70	284	17.58	5.50
	100	17.34	867.3	4.87	323	17.88	5.83
LSD at 0.50 level	**A**	0.344	22.96	0.154	9.625	0.325	0.231
	B	0.344	22.96	0.154	9.625	0.325	0.231
	AB	0.687	45.92	0.307	19.25	0.651	0.462

Data presented in the same Table (3) indicated that there were significant differences in the yield and their components between the four cultivars. Furthermore, total marketable yield (ton/fed) in Menoufia 6, 2 and 4 cultivars yielded 16.1, 33.6 and 44.8, respectively compared with the check mabrouka cultivars. The same table also showed the interaction between K rates fertilizer and cultivars of sweet potato. In this concern, 100 % K gave the highest values in the total marketable yield and average weight of tuber roots (g) but the remained traits (average of weight and number of tuber root per plant and average length and diameter of tuber root (cm) were not significantly increases between the two potassium rates 75 % and 100 % and the other rates

Similar results were also recorded by Melvin *et al*. (2002) who studied the effects of four levels of potassium (150, 300, 450 and 600 kg /ha) on sweet potato and concluded that application of potassium at 300 kg/ha resulted in the highest yield and root dry matter. Sokoto *et al*., (2007) also showed that the addition of K had significant increases on marketable tubers yield of sweet potato. Byju and ray (2002) observed that tuber shape index of sweet potato was increased significantly with increasing potassium rates.

Effect of potassium fertilization rates and sweet potato cultivars on tuber quality characteristics

Table (4) clearly showed that there were significant differences among sweet potato cultivars for most of the tuber quality characteristics. In this respect Menoufia 6 cv. gives the highest values of dry weight of tuber roots percentage, vitamins (mg/100g), fresh weight and protein percentage. While Menoufia 4 was the highest in sugar percentage and carotene content. In respect to the effect of fertilizers rates on tuber quality characteristics of sweet potato. Table (4) also showed that all traits increase with increasing the rate of K except dry weight of tuber roots percentage where the rate of 75 % was similar to that of 100 %.

With respect to the interaction between the effect of fertilizers rates and sweet potato cultivars, the same Table (4) cleared that Menoufia 2 cv. significantly increased with increasing the rate of K except total sugar percentage, vitamins and protein which were similar at 75 % and 100 % K rates. For Menoufia 4 all qualities traits increased with increasing K rates except dry weight of tuber roots and total carbohydrates percentages which were similar at 75% and 100% K rates. Menoufia 6 and Mabrooka chick were also similar at 75 % and 100 % K rates except vitamin C and carotene respectively. Protein percentage in the two cultivars was increased with increasing K rates.

Similar results were also recorded by Melvin *et al*., (2002) on sweet potato where they found that application of potassium at 300 kg/ha resulted in the highest values of carotene content and potassium concentration in roots they also illustrated the importance of potassium in sweet potato production for it's effect on cell divisions tuberous root initiation and thickening, photosynthesis–formation of carbohydrates, translocation of sugars, mineral nutrients and photosynthetic matter and enzyme activity.

There were also significant differences between all K rates and without potassium. Similar results were also recorded by Byju and Ray (2002) Njoku *et al*., (2002), Jhon *et al*., (2004) and Patil *et al*., (1990).

Effect of potassium fertilization rates and sweet potato cultivars on some mineral contents and its uptake:

Data presented in Table (5) showed that there were highly significant differences among cultivars for NPK percentage and its uptake by tuber root (Kg/fed.). In this concern, Minoufia 6 and Menoufia 2 cultivars gives highest values of NPK percentage and its uptake by tuber root. In respect to the effect of potassium fertilizer rates, data cleared that N percentage and its uptake by tuber root were significantly increased with increasing K rates. In case of P and K percentage, insignificant differences were detected between the two K fertilizer levels of 75 and 100 % from the recommended does to sweet potato, while its uptake by tuber roots was significantly increased with increasing K rates. With respect to the effect of potassium fertilizer rates and sweet potato cultivars interaction on NPK contents and also uptake, data in the same Table indicated that there were significant increases in N content and its uptake by tuber root with increasing potassium rates for all cultivars except Menoufia 2 which gave similar results at 75 and 100 % from the recommended sweet potato. For P and K contents data reflected similar results at 75 and 100% from recommended of sweet potato for all cultivars under study. These finding are in agreement with those obtained by Melvin *et al*., (2002) and Ali *et al*., (2009).

Table (4): Effect of potassium fertilization rates and sweetpotato cultivars on the quality traits (combined analysis of 2013 and 2014 seasons).

Treatment		Dry weights of roots (%)	Total basis dry weight (%)		Fresh weight (mg/100 g.)		Protein (%)
Cultivars (A)	K-Fertilizer rates (B)		Carbohydrates	Sugars	Carotein	Vitamin C	
Minfuia 2	0	18.11	71.00	3.01	11.87	14.48	7.25
	50	21.27	73.16	3.18	13.62	17.10	7.63
	75	25.04	78.92	4.12	14.98	19.17	8.14
	100	25.32	81.66	5.66	15.32	21.24	8.75
Mean (A)		**22.44**	**76.18**	**3.99**	**13.95**	**18.00**	**7.94**
Minfuia 4	0	17.42	76.19	3.92	11.10	19.16	6.06
	50	20.15	78.75	4.16	13.86	20.12	6.63
	75	23.00	81.16	5.42	15.21	24.41	7.19
	100	23.18	83.94	6.82	16.18	27.32	8.13
Mean (A)		**20.94**	**80.01**	**5.08**	**14.09**	**22.75**	**7.00**
Minfuia 6	0	19.34	69.22	3.66	6.32	24.18	7.50
	50	23.77	74.36	3.76	7.88	26.33	8.81
	75	28.84	79.11	3.83	8.63	27.21	9.50
	100	29.23	82.46	3.87	9.00	28.16	10.69
Mean (A)		**25.30**	**76.29**	**3.78**	**7.96**	**26.47**	**9.13**
Mabrouka	0	19.18	73.16	2.71	3.82	22.11	4.00
	50	24.11	79.00	2.88	4.11	23.76	5.44
	75	27.56	84.13	2.93	4.64	24.13	5.92
	100	28.32	86.22	2.97	5.78	24.32	7.13
Mean (A)		**24.79**	**80.63**	**2.87**	**4.59**	**23.58**	**5.62**
Mean (B)	**0**	**18.51**	**72.39**	**3.33**	**8.28**	**19.98**	**6.20**
	50	**22.33**	**76.32**	**3.5**	**9.87**	**21.83**	**7.13**
	75	**26.11**	**80.83**	**4.08**	**10.86**	**23.73**	**7.69**
	100	**26.51**	**83.57**	**4.83**	**11.57**	**25.26**	**8.68**
LSD at 0.50 level	**A**	**0.495**	**1.347**	**0.468**	**0.362**	**0.401**	**0.174**
	B	**0.495**	**1.347**	**0.468**	**0.362**	**0.401**	**0.174**
	AB	**0.990**	**2.693**	**0.936**	**0.724**	**0.801**	**0.348**

Table (5): Effect of potassium fertilization rates and sweet potato cultivars on NPK contents and its uptake (combined analysis of 2013 and 2014 seasons).

Treatment		N		P		K	
Cultivars (A)	**K-Fertilizer rates (B)**	**%**	**uptake (kg/fed.)**	**%**	**uptake (kg/fed.)**	**%**	**uptake (kg/fed.)**
Minfuia 2	**0**	1.16	24.22	0.828	17.29	0.5	10.44
	50	1.22	39.45	0.867	28.04	1.38	44.63
	75	1.3	61.26	0.922	43.45	2.06	97.08
	100	1.4	67.38	0.951	45.77	2.18	104.91
Mean (A)		**1.27**	**48.08**	**0.892**	**33.64**	**1.53**	**64.27**
Minfuia 4	**0**	0.97	15.37	0.604	9.57	0.62	9.82
	50	1.06	25.44	0.615	14.76	1.56	37.44
	75	1.15	39.41	0.768	26.32	2.73	93.56
	100	1.3	45.54	0.782	27.39	2.87	100.53
Mean (A)		**1.12**	**31.44**	**0.692**	**19.51**	**1.95**	**60.34**
Minfuia 6	**0**	1.2	34.7	0.564	16.31	0.78	22.56
	50	1.41	61.25	0.677	29.41	1.77	76.89
	75	1.52	96.09	0.701	44.32	2.85	180.18
	100	1.71	110.83	0.713	46.21	2.98	193.15
Mean (A)		**1.46**	**75.72**	**0.664**	**34.06**	**2.1**	**118.20**
Mabrouka	**0**	0.64	9.73	0.532	8.09	0.48	7.3
	50	0.87	21.3	0.611	14.96	1.27	31.09
	75	1	33.6	0.642	21.57	2.33	78.29
	100	1.14	40.06	0.655	23.02	2.42	85.04
Mean (A)		**0.91**	**26.17**	**0.61**	**16.91**	**1.63**	**50.43**
Mean (B)	**0**	**0.99**	**21.01**	**0.63**	**12.82**	**0.60**	**12.53**
	50	**1.14**	**36.86**	**0.69**	**21.79**	**1.50**	**47.51**
	75	**1.24**	**57.59**	**0.76**	**33.92**	**2.49**	**112.28**
	100	**1.39**	**65.95**	**0.78**	**35.60**	**2.61**	**120.91**
LSD at 0.50 level	**A**	**0.069**	**1.491**	**0.026**	**1.18**	**0.198**	**1.941**
	B	**0.069**	**1.491**	**0.026**	**1.18**	**0.198**	**1.941**
	AB	**0.137**	**2.982**	**0.052**	**2.359**	**0.386**	**3.883**

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تأثير التسميد البوتاسى على النمو والمحصول والجودة لبعض أصناف البطاطا

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الملخص العربى

اجريت تجربتان حقليتان خلال الموسمين الصيفيين لعامى 2013 و 2014 فى مزرعة محطة بحوث البساتين بالقناطر الخيرية، محافظة القليوبية، مصر لدراسة تأثير معدلات التسميد البوتاسي (0، 50، 75، 100 % من المعدل الموصى به للبطاطا) على النمو والمحصول والجودة لبعض أصناف البطاطا الجديدة (منوفية 2؛ 4 و6) مقارنة بالصنف المحلى (مبروكة).

أوضحت النتائج المتحصل عليها وجود أختلافات معنوية بين معدلات التسميد المستخدمة والأصناف وكذلك التفاعل بين (التسميد × الأصناف) على معظم الصفات المدروسه.

اعطى الصنف منوفية 6 أعلى قيم فى المحصول التسويقى للجذور المخزنة ووزن الجذر الواحد وكذلك نسبة المادة الجافة، بينما اعطى الصنف منوفية 2 أعلى قيم فى عدد الجذور على النبات الواحد.

أوضحت النتائج وجود فروق معنوية فى جميع صفات النمو حيث زادت بزيادة معدل التسميد البوتاسى، وأظهرت النتائج عدم وجود أختلافات معنوية فى صفات الجودة بين المعدلين 75 و 100 % من الموصى به للبطاطا مثل نسبة المادة الجافة للجذور، والكربوهيدرات الكلية بينما وجدت أختلافات معنوية فى كل من السكريات الكلية، الكاروتين و فيتامين سى والبروتين بزيادة معدلات التسميد البوتاسى.

زاد عنصر النتروجين بزيادة معدل التسميد البوتاسى من 75 إلى 100 % من الموصى به للبطاطا لجميع الأصناف تحت الدراسة ما عدا الصنف منوفية 2 اذ كان هناك تشابه فى كلا المعدلين 75 و100 % بوتاسيوم، أما العنصرين الفوسفور والبوتاسيوم فتشابها عند اضافة التسميد البوتاسى بمعدلى 75 و 100 % بينما زاد امتصاص العناصر (النيتروجين–الفوسفور–البوتاسيوم) بزيادة التسميد البوتاسى لجميع الأصناف تحت الدراسة.

وبصفة عامة، يمكن القول أن استخدام التسميد البوتاسي فى تسميد البطاطا بمعدل 75 % أعطى أعلى إنتاجية وتحسن فى صفات جودة الجذور وبعض مكونات العناصر لبعض أصناف البطاطا الجديدة مقارنة بالصنف المحلى مبروكة.