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EFFECT OF NITROGEN AND POTASSIUM LEVELS ON YIELD AND YIELD COMPONENTS OF SOME RICE GENOTYPES UNDER SALIN SOILS.

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ABSTRACT

Integrating rice crop management involving using salt tolerant variety and proper cultivation is the main strategy to increase rice production under saline soils.

Two field Experiments were conducted during 2006 and 2007 Rice growing seasons at the research farm of El-Sirw Agricultural Research Station Damietta Governorate, Egypt. The experiments were conducted to study the effect of three nitrogen levels o, 35 and70 kg N/fed and three potassium levels o, 24, 48.kgK2O/fed and their interaction on growth yield and its components of some rice genotypes (SK2046H or EHR1) (SK2034H or EHR2) i.e. hybrid ones and Giza 178 i.e. inbred one under saline soil conditions. Split – split plot design with four replications was used in the experiments , the varieties were distributed in the main plots the sub- plots were allocated to three nitrogen rates the sub plot were devoted to three potassium rates.

The main obtained results could be summarized. The nitrogen levels had positive and significant effects on plant height, tiller number, panicle length, panicle number, filled grain / panicle, panicle weight, 1000 – grain weight, grain yield and straw yield. All rice cultivar significantly responded to nitrogen fertilizer up to 70 kg N/fed. Potassium fertilizer significantly increased rice growth, yield components and rice grain yield in both seasons. Rice response to potassium fertilizer was significantly up to higher potassium level of 48 kg K2O/fed. Egyptian hybrid one EHR1 (SK2034H) with 70kgN/fed and 48kgK_2O/fed gave the highest values of estimated growth parameters, yield components and grain yield under current study. Rice genotypes significantly varied in their growth traits, yield component and grain yield as well as harvest index. (SK2034H) hybrid rice variety significantly surpassed other two tested genotypes followed by Giza 178 rice variety. (SK2046H) occupied the last rank.

It could be concluded that EHR1 had to be fertilized by70 kg N/fed and 48 kg k_2o /fed under current saline conditions for producing considerable grain yield.

INTRODUCTION

Rice (Oryza sativa, L) is considered as one of the most important food cereal grain crops after wheat in Egypt. It is a staple food for nearly one half of the world population most of them live in developing countries In the 2010 year the annual area cultivated by rice in Egypt is about 1.5 million feddans which is about 0.63 million hectares and the total rice production reached about 6 million tons with a national average of 9.30 ton/ha.

Rising rice productivity under saline soil is very important to increase rice average yield since rice is growing under wide salt affected area with low yield.

Exploring hybrid rice under saline using its high heterosis might increase rice yield under such condition in which Zayed *et al*.,(2006b,2007 and 2010) found great variation between hybrid rice and inbred rice under saline. Moreover, Gautam.A.K (2004) and Abou Khalifa (20005) stated variation between hybrid and inbred rice related to their growth, yield components and rice grain yiled

Nitrogen fertilization is applied to meet the needs of the crop during the early growth stages accumulated in the vegetative parts to be utilized for grain formation for ensuring economic grain yield. The large portion of the nitrogen is absorbed during differentiation stage where the leaves and stems contain a large portion of the nitrogen uptake by the plant. Also, nitrogen fertilization application plays a vital role in nitrogen % in rice grain and nitrogen uptake by rice plant (Ebaid and Ghanem 2001).

El-Shayeb (2003) found that increasing nitrogen up to 80kgN /fed significantly increased plant height, panicle length, panicle number, filled grains / panicle, panicle weight, straw and grain yield. Zayed *et al*. (2006b) and Lin *et al*. (2009) stated that increasing nitrogen rate up to 180 kg N/ha significantly increased rice growth, yield and yield components under saline soil. Bahmanyar and Soodaee (2010) reported that increasing nitrogen levels significantly increased plant height, leaf area, yield components and grain yield.

Potassium recommended to be applied under saline soil for alleviation salinity tolerance and rice productivity. Potassium fertilization had a marked influence on the over all nutrient levels in grain. Nour *et al*. (1997) and Ebaid and Ghanem (2001) found that potassium fertilization increased rice yield and its components. Under saline soil, Zayed (2002), Shahzada *et al*.(2007) , Zayed *et al*. (2007) and Bahmanyar and Soodaee (2010) studied the effect of three potassium levels (0, 20 and 40 kg K2O / fed) on the yield components and chemical contents of rice. They found that potassium application had positive effects on growth, yield components, grain yield and nitrogen.

Zayed *et al*. (2006b and 2007) reported significant differences in rice hybrid and inbred regarding their response to both nitrogen and potassium fertilizer rates.

The current study amid to find out the optimum nitrogen and potassium rate for both hybrid and inbred rice varieties under saline soils.

MATERAILS AND METHODS

Two field Experiments were conducted during 2006 and 2007 seasons at the Research Farm of El-Sirw Agricultural Research Station, Damietta province, Egypt. The experiments were amid to study the effect of three nitrogen levels i.e. 0, 35and 70 kg N/fed, and three potassium levels i.e. 0, 24and 48 kgK2O/fed as well as their interaction on growth, yield and its components of some rice genotypes (SK2046H or EHR1), (SK2034H or EHR2) as hybrid rice and Giza 178 as inbred rice under saline soil conditions. A split – split plot design with four replications was used, the varieties were distributed in the main and plot the sub- plots were allocated to the three nitrogen rates while, the sub-sub plot were devoted to the three potassium rates.

Seedling of 30 days old of rice was transplanted with 3 seedlings hill^{-1}, spaced at 20 x 20 cm. Transplanting was done on April, 20th and harvested on September1st. Nitrogen fertilizer in the abovementioned rates was imposed in 4 equal doses i.e. 15 days after transplanting (DAT), mid-tillering stage, panicle initiation stage, and end of booting stage as recommended under saline soil. All plots received 90 kg P_2O_5/ha in the form of calcium super phosphate. Plot area was adjusted to 10 m^2. The soil was clay and the soil chemical properties were listed in Table 1.

Table 1: Soil chemical properties at the experimental sites during 2010 and 2011seasons.

season	pH	EC dS m^{-1}	Cation meq L^{-1}			Anion Meq L^{-1}		
			Ca^{++} + Mg^{++}	Na^+	K^+	$SO^=_4$	Cl^-	HCO^-_3
2006	8.3	7.5	20.0	58.0	0.32	26.5	45.3	8.0
2007	8.2	6.5	18.0	57.0	0.31	20.0	46.0	7.0

Available nutrients mg kg^{-1}							
	N	**P**	**K**	**Zn**	**S**	**Fe**	**Cu**
2006	28.0	9.12	245.0	1.22	10.7	5.00	6.2
2007	26.0	9.35	280.0	1.16	10.5	5.13	6.0

At heading stages, ten hills from each plot were taken to estimate leaf area index (LAI) and dry mater (the dry samples were weighed and dry matter g m^{-2} was computed.

At harvest, panicles of ten guarded hills for each plot were counted to determine the number of panicles m^{-2} and also plant height (cm) was measured. Ten main panicles from each subplot were packed to determine panicle length (cm), filled and unfilled grains panicle $^{-1}$, panicle and 1000-grain weights (g). The plants of the six inner rows of each sub-sub plot were harvested, dried, threshed, then grain and straw yields were determined at 14 % moisture content and converted into t ha^{-1}. Soil was sampled before planting for soil chemical analysis according to Piper, 1950.

All data collected were subjected to standard statistical analysis following the proceeding described by Gomez and Gomez (1984) using the computer program (IRRISTAT). The treatment means were compared using Duncan's multiple range test (Duncan, 1955). Indicate the significant at 5% and 1% levels of probability, respectively, while NS means not significant.

RESULTS AND DISCUSSION

Varietals differences:

Data in Tables2,3and4 showed that the tested three rice genotypes, hybrid ones; EHR1, EHR2 as well as inbred one, Giza 178 significantly varied The measured traits; dry matter, leaf area index (LAI), heading date, tillers number/m^2, panicle numbers/m^2, plant height, panicle length, filled grains /panicle, unfilled grains/panicle, panicle weight, 1000-grain weight, grain yield (t/fed), straw yield (t/fed) and harvest index were significantly differed in both seasons except, filled grain /panicle in 2006 season. EHR1 hybrid rice variety showed its superiority in the above-mentioned traits in both seasons followed by EHR2. Giza 178 inbred rice variety was in the last rank regarding the abovementioned traits in both seasons. The superiority of hybrid rice variety was mainly due to their higher heterosis than that inbred one. Similar findings had been reported by Gautam *et al*. (2004), Abou Khalifa (2005), Zayed *et al*. (2005), Zayed *et al*. (2006a and b) Zayed *et al* (2010).

Table (2): Dry matter(g)/m^2 leaf area index ,day to heading, plant height and number of tiller/m^2 of some rice genotypes as affected by nitrogen and potassium level under saline soil during 2006 and 2007 seasons

Characters	Dry matter g /m^2		Leaf area index		Days to heading		Plant height / plant (cm)		No of tillers/m^2	
Treatments	**2006**	**2007**	**2006**	**2007**	**2006**	**2007**	**2006**	**2007**	**2006**	**2007**
Hybrid 1	1294.7	1274.1	4.02	4.05	108.3	108.6	90.02	96.50	472.00	402.58
Hybrid2	1277.9	1254.5	3.82	3.86	108.3	107.59	85.03	95.66	431.00	396.31
Giza178	1217.3	1197.9	3.67	2.86	107.1	106.8	83.45	93.79	421.00	347.38
LSD 0.05	0.45	0.53	0.26	0.07	0.26	0.21	1.73	1.31	0.57	0.33
N levels										
0kg/fed	1044.4	1012.7	2.60	2.62	105.9	105.6	84.51	93.21	397.75	323.00
35kg/fed	1283.7	1267.6	4.15	3.92	107.8	107.2	86.74	95.36	448.50	391.91
70kg/fed	1461.0	1445.9	4.77	4.25	110.0	109.5	89.27	97.22	479.50	431.16
LSD 0.05	0.37	0.46	0.20	0.08	0.24	0.27	1.28	0.61	0.55	0.28
K levels										
0kg/fed	1180.6	1194.7	3.34	3.11	107.4	106.9	84.52	93.50	414.00	353.41
24kg/fed	1272.1	1252.6	3.89	3.72	107.9	107.5	86.38	95.77	446.66	386.58
48kg/fed	1337.3	1323.9	4.29	3.94	108.7	107.9	89.62	96.75	465.33	406.08
LSD 0.05	0.21	0.20	0.11	0.08	0.26	0.21	1.02	0.60	0.46	0.27
Interactions										
GxN	**	**	**	**	**	**	NS	NS	**	*
GxK	**	**	**	**	*	**	NS	**	NS	NS
NxK	**	**	**	**	NS	NS	NS	NS	**	NS
GxNxK	NS	**	**	**	*	**	NS	NS	NS	**

Nitrogen rates:

Data arranged in Tables 2,3 and4 indicated that nitrogen level had positive and significant effect on all the studied traits regarding the current study it was obviously that increasing nitrogen level up to 70 kg N / fed significantly magnified the growth yield and yield components of rice. Generally, the Lowest values of leaf area index , plant height, mater, number of tillers /m^2, number of panicles / m^2, number of filled grains / panicle , panicle weight , 1000- grain weight , grain yield and straw yield in the first and the second season were obtained when nitrogen fertilizer was not applied (zero nitrogen level). On contrary, the highest values of these traits were produced when the high nitrogen level of 70kg N/fed was added for the rice crop in both seasons. The enhancing grain yield of rice resulting from increasing nitrogen level might be due to increasing growth photosynthetic rate, net assimilation rate, yield components such as panicles number and number of filled grains / panicle. The findings are in complete conformity with those obtained by El-Shayeb (2003), Gautam *et al*. (2004), Ebaid(2006), Zayed *et al*.(2006b) , and Bahmanyar. and Soodaee (2010).

Table 3: Number of panicle/m^2, panicle length(cm), panicle weight(g), number of filled grains/panicle and number of unfilled grains/panicle of some rice genotypes as affected by nitrogen and potassium rates level under saline soils during during2006and2007

Characters treatments	Panicles/ m^2		panicle length		Panicle weight		Filled grains/ panicle		Unfilled grains /panicle	
Genotypes	**2006**	**2007**	**2006**	**2007**	**2006**	**2007**	**2006**	**2007**	**2006**	**2007**
Hybrid 1	415.97	359.96	21.94	21.60	2.68	2.79	128.28	129.55	10.83	12.02
Hybrid2	362.38	349.66	21.74	21.38	2.68	2.59	123.85	124.52	16.83	18.33
Giza178	308.87	306.24	21.29	21.07	2.64	2.31	124.49	122.79	09.55	11.05
LSD0.05	10.80	80.00	0.32	0.45	0.02	0.05	NS	2.45	1.16	1.76
N levels										
0kg/fed	333.75	288.25	21.18	20.25	2.39	2.07	119.67	144.63	21.22	22.27
35kg/fed	395.55	342.83	21.65	21.63	2.66	2.59	125.43	126.80	10.58	11.83
70kg/fed	439.00	384.83	22.15	22.17	2.97	3.03	127.52	135.43	05.41	07.30
LSD0.05	13.50	06.00	0.26	0.29	0.03	0.03	4.02	1.74	0.76	0.80
K levels										
0kg/fed	359.08	311.83	21.02	21.39	2.46	2.33	116.81	117.66	15.11	17.47
24kg/fed	385.00	341.83	21.80	21.39	2.70	2.58	123.47	126.64	12.03	13.47
48kg/fed	415.16	362.25	22.16	21. 84	2.85	2.78	132.58	132.56	09.47	10.47
LSD0.05	08.80	06.30	0.10	0.21	0.03	0.03	3.55	1.80	0.85	0.47
Interactions										
GxN	NS	*	NS	**	**	**	**	**	**	**
GxK	**	NS	**	NS	**	**	**	**	**	**
NxK	NS	**	**	NS	**	**	NS	NS	**	**
GxNxK	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

Potassium levels:

General speaking, the potassium fertilizer had a fruitful effects on the rice crop involving growth, yield, yield components and growth in both seasons. As presented in Tables 2,3 &4 increasing potassium fertilizer up to 48kg K20/fed significantly increased the majority of the studied traits. Rice grain yield and yield components significantly responded to potassium application up to 48 Kg/ fed (Table4). On the other hand, the lowest values of leaf area index, plant height, panicles number /m^2, panicle weight, number of filled grains / panicle, 1000- grain weight, grain yield, straw yield, were observed when no potassium was applied i.e. zero potassium level, while the highest values were found when the high potassium level of 48kg $k_2$0/fed was applied. Potassium fertilizer didn't affect the harvest index. It is mentioning here, that potassium fertilizer improved both source and sink of rice leading to high grain yield potassium fertilizer encouraged the photosynthesis thesis process and produced large leaf area involving leaf area index which contributes to a great part in the grain filling. In addition, potassium fertilizer enhanced the reserve of assimilates to sink resulting in more filled grains / panicle, lower unfilled grains/ panicle and more panicles number / m^2. All above-mentioned effects enable potassium to produce considerable gain yield under saline soils.

Table (4):1000-grain weight (g), grain and straw yields (ton/fed) and harvest index of some rice genotypes as affected by nitrogen and potassium levels under saline soil during 2006and2007seasons.

Characters / Treatments	1000-grain weight		grain yield		Straw yield		Harvest index	
Genotypes	**2006**	**2007**	**2006**	**2007**	**2006**	**2007**	**2006**	**2007**
Hybrid 1	22.68	23.76	2.42	2.67	2.19	2.56	42.17	42.71
Hybrid2	22.68	23.67	2.35	2.46	2.99	3.32	42.93	41.60
Giza178	21.07	21.56	2.29	2.14	2.76	3.32	40.94	38.68
LSD0.05	0.04	0.11	0.09	0.12	0.14	0.15	NS	2.45
N levels								
0kg/fed	20.60	21.38	1. 80	2.07	2.66	3.09	40.14	39.29
35kg/fed	22.39	23.33	2.81	1.42	2.91	3.34	43.63	41.61
70kg/fed	23.50	24.38	2.69	2.79	3.36	3.87	42.61	41.55
LSD0.05	0.02	0.04	0.11	0.13	0.18	0.17	4.02	1.74
K levels								
0kg/fed	21.36	22.49	1.96	2.18	2.65	3.22	41.69	40.17
24kg/fed	22.39	23.14	2.36	2.50	3.06	3.44	42.61	41.29
48kg/fed	22.84	23.47	2.65	2.58	3.23	3.64	42.07	41.00
LSD0.05	0.03	0.06	0.09	0.09	0.13	0.16	NS	NS
Interactions								
GxN	**	**	**	**	NS	NS	NS	NS
GxK	NS	NS	NS	NS	NS	NS	NS	NS
NxK	NS	NS	**	**	NS	NS	NS	NS
GxNxK	NS	NS	NS	NS	NS	NS	NS	NS

These findings are in a harmony with those reported by Nour *et al*. (1997) Ebaid and Ghanem (2001) and as well as Zayed *et al*. (2007) and Bahmanyar and Soodaee (2010).

The interaction effect:

The interaction between rice genotypes and nitrogen levels had significant effect on dry matter, lAI, number of tillers/m2 in both seasons, number of panicles/m2 in 2007 season only, number of filed grains /panicle, number of unfilled grains/panicle and panicle weight in both seasons. The rest of measured traits including grain yield didn't response significantly to the interaction between rice genotypes and nitrogen levels in both seasons. The current interaction showed the superiority of the combination of EHR1 and 70 kg N /fed under current conditions (Table 5&6).

The interaction between rice genotypes and potassium levels had significant effect on dry matter, LAI, number of tillers/m2, number of panicles/m2 in 2007 seasons, number of filed grains /panicle , number of unfilled grains/panicle and panicle weight in both seasons. The rest of measured traits including grain yield didn't response significantly to the interaction between genotypes and potassium levels in both seasons. The current interaction showed the superiority of the combination of EHR1 and 48 kg k_2o /fed under current conditions (Table 7&8).

Table 5 :LAI, dry matter/ m^2, number of tillers/ m^2, number of panicles/ m^2 as affected by the interaction between rice genotypes and nitrogen levels during 2006and2007seasons.

Genotypes	N Levelskg N/fed	dry matter/ m^2		LAI		number of tillers/m^2		number of panicles/ m^2
		2006	2007	2006	2007	2006	2007	2007
SK2034H	0	1130.7	1115.5	2.58	2.65	420.91	335.33	297.91
	35	1243.4	1244.0	4.43	4.56	473.83	419.58	372.83
	70	1480.1	1468.3	5.05	4.95	523.41	452.83	409.16
SK2046H	0	987.4	935.8	2.57	2.65	417.75	347.00	309.66
	35	1351.1	1345.8	4.33	4.39	429.83	395.50	338.00
	70	1495.2	1481.3	4.56	4.55	447.00	445.91	401.33
Giza 178	0	1015.5	992.2	2.64	2.55	354.33	286.58	257.25
	35	1226.7	1213.5	3.67	2.83	442.75	360.83	317.41
	70	1410.2	1388.0	4.70	3.22	476.91	394.75	344.08
LSD0.05		65.13	78.98	0.37	0.14	0.90	0.48	0.44

Table 6:Filled and unfilled grains/panicle, panicle weight(g)and grain yield(ton/fed) as affected by the interaction between rice genotypes and nitrogen levels during 2006and2007seasons

genotypes	N levels Kg N/fed	Filled grains/panicle		unfilled grains/panicle		Panicle weight		Grain yield ton/fed) (	
		2006	2007	2006	2007	2006	2007	2006	2007
SK2034H	0	116.83	119.08	19.75	20.58	2.20	2.19	2.08	2.12
	35	128.58	129.83	8.75	10.25	2.62	2.88	2.36	2.38
	70	139.45	139.76	4.00	5.25	3.24	3.34	2.73	2.78
SK2046H	0	115.80	117.81	27.33	28.91	2.60	2.23	1.62	1.69
	35	125.98	126.56	12.25	16.25	2.64	2.54	1.95	2.06
	70	129.89	129.20	7.91	9.83	2.81	2.95	2.24	2.27
Giza 178	0	110.18	107.02	16.58	17.33	2.36	1.81	1.48	1.50
	35	123.44	124.02	7.75	9.00	2.71	2.35	1.82	1.87
	70	139.87	137.33	4.33	6.83	2.86	2.97	2.07	2.09
LSD0.05		2.57	3.21	1.47	1.93	0.05	0.06	0.013	0.016

The interaction between nitrogen and potassium levels had significant effect on dry matter, LAI, number of panicles/m2 in 2006 season only, number of unfilled grains/panicle and panicle weight in both seasons. The rest of measured traits including grain yield didn't response significantly to the interaction between nitrogen and potassium levels in both seasons. The current interaction showed the superiority of the combination of 60 kg N/fed and 48 kg k_2o /fed under current conditions (Table9&10).

Table7: dry matter/ m^2 ,LAI, number of tillers/ m^2 and number of panicle/ m^2 as affected by the interaction between rice genotypes and potassium levels during 2006and2007seasons

genotypes	K levels kg K_2O	Filled grains/panicle		unfilled grains/panicle		Panicle weight (g)	
		2006	2007	2006	2007	2006	2007
SK2034H	0	119.56	123.45	13.91	15.58	2.49	2.61
	24	128.13	129.11	10.50	11.66	2.69	2.77
	48	137.15	136.32	8.08	8.83	2.88	3.00
SK2046H	0	113.83	113.74	21.33	23.16	2.50	2.32
	24	125.76	126.67	16.08	17.50	2.69	2.61
	48	132.18	133.15	13.08	14.33	2.85	2.79
Giza 178	0	117.03	115.99	11.91	13.66	3.39	2.06
	24	128.07	124.15	9.50	12.25	2.71	2.36
	48	128.39	128.22	7.25	8.25	2.38	2.54
LSD0.05		5.04	3.30	1.56	9.90	0.04	0.06

Table 8: Filled and unfilled grains/panicle, panicle weight (g) and grain yield as affected by the interaction between rice genotypes and potassium levels in2006and2007seasons

Genotypes	K levels kgk$_2$O/ fed	dry matter/ m^2		LAI		number of panicle/m^2
		2006	2007	2006	2007	2006
SK2034H	0	1222.6	1188.2	3.22	3.29	393.53
	24	1305.9	1285.6	4.27	4.30	410.91
	48	1355.7	1348.4	4.57	4.57	443.41
SK2046H	0	1214.0	1186.6	3.48	3.56	327.83
	24	1280.7	1256.5	3.72	3.50	356.83
	48	1338.7	1319.3	4.27	4.14	402.50
Giza 178	0	1104.3	1074.3	3.31	2.48	355.75
	24	1229.6	1215.7	3.69	2.98	387.41
	48	1318.0	1303.9	4.02	3.12	399.75
LSD0.05		51.16	57.12	0.28	0.13	15.50

Table 9: dry matter/ m^2**LAI number of tiller/** m^2 **and number of panicle/** m^2 **as affected by the interaction between nitrogen and potassium levels during 2006and2007seasons**

N Level kg N /fed	K level kg K_2O/fed	dry matter/ m^2		LAI		number of panicle/m^2
		2006	2007	2006	2007	200٧
0	0	1012.5	951.0	2.32	2.40	256.00
	24	1033.0	1005.0	2.49	2.60	289.50
	48	1087.6	1082.0	2.99	3.84	319.25
35	0	1182.8	1167.0	3.52	3.25	320.75
	24	1315.8	1293.8	4.30	4.19	347.25
	48	1352.4	1341.9	4.62	4.32	360.50
70	0	1346.4	1337.0	4.18	3.67	358.75
	24	1467.5	1458.9	4.89	4.39	388.75
	48	1571.6	1547.7	5.25	4.67	407.00
LSD0.05		47.35	53.96	0.26	0.15	10.50

Table10:Filled and unfilled grain/panicle panicle weight(g)and grain yield as affected by the interaction between nitrogen and potassium levels during2006and2007seasons

N levels kg N /fed	K levels kg K_2O/fed	Unfilled grains/panicle		Panicle weight (g)		Grain yield ton/fed) (	
		2006	2007	2006	2007	2006	2007
0	0	26.75	28.33	2.18	1.80	1.64	1.70
	24	20.42	21.58	2.43	2.12	1.73	1.78
	48	16.50	16.92	2.56	2.30	1.81	1.83
35	0	21.58	13.92	2.41	2.43	1.97	2.00
	24	10.75	12.08	2.70	2.60	2.02	2.12
	48	8.42	9.50	2.87	2.75	2.15	2.19
70	0	7.83	10.17	2.81	2.77	2.28	2.33
	24	4.92	6.75	2.97	3.03	2.33	2.38
	48	3.50	5.00	3.14	3.29	2.43	2.44
LSD0.05		1.40	1.27	0.44	0.05	0.029	0.016

The tri-interaction among rice varieties, nitrogen and potassium levels had insignificant effect on dry matter, lAI, number of tillers/m2, number of panicles/m2 in 2007 seasons, number of unfilled grains/panicle and panicle weight in both seasons. The tri- interaction showed the superiority of the combination of EHR1, 70 kg N/fed and 48 kg k_2o /fed under current conditions in rice grain yield in both seasons. All rice varieties growing under saline soil need to potassium fertilizer by the same amount of 48 kg k_2o /fed(Table 11). It could be concluded that EHR1 had to be fertilized by70 kg N/fed and 48 kg k_2o /fed under current saline conditions for producing considerable grain yield.

Table 11: grain yield (t/fed) of some rice genotypes as affected by the tri-interaction during 2006 and 2007 seasons.

Genotypes	N levels kg fed^{-1}.	Grain yield t/fed							
		2006				2007			
		K level kg k_2O fed^{-1}.				K level kg k_2O fed^{-1}.			
		0	24	48	mean	0	24	48	mean
SK2034H	0	1.88	2.01	2.25	2.04	2.17	2.32	2.4	2.31
	35	2.13	2.45	2.57	2.38	2.37	2.61	2.81	2.59
	70	2.40	2.90	3.18	2.83	2.71	3.20	3.37	3.09
	mean	2.13	2.46	2.67	2.42	2.42	2.71	2.87	2.67
SK2046H	0	1.58	1.84	1.93	1.78	1.77	2.10	2.17	2.01
	35	2.02	2.72	3.31	2.68	2.22	2.67	2.92	2.60
	70	2.18	2.76	2.85	2.59	2.37	2.90	3.02	2.76
	mean	1.92	2.44	2.70	2.35	2.12	2.55	2.70	2.46
Giza178	0	1.52	1.63	1.59	1.58	1.80	1.82	2.02	1.88
	35	1.72	2.28	2.55	2.18	1.88	2.40	2.45	2.24
	70	2.26	2.68	3.03	2.66	2.37	2.55	2.65	2.52
	mean	1.84	2.20	2.39	2.14	2.02	2.25	2.37	2.21
LSD 0.05		0.029				0.026			

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تـأثير مسـتويات النيتـروجين والبوتاسـيوم علـى بعض التراكيـب الوراثيـة مـن الأرز تحت ظروف الأرض الملحية

احمد مصطفى هجرس[1] ، بسيونى عبدالرازق زايد[2] ، نبيل فهيم دوله[1] و احمد محمد زايد[2]

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أجريـت تجربتـان حقليتـان خـلال موسـمى ٢٠٠٦ ,٢٠٠٧ بمزرعـة بحـوث السـرو – محطـة البحـوث الزراعيه – محافظة دمياط – مصر. يهدف دراسة تأثير ثلاث معدلات من التسميد النيتروجينى صفر- ٣٥ – ٧٠ كجم ن/ فدان وثلاث معدلات من التسميد البوتاسى صفر – ٢٤ – ٤٨ كجم بو٢أ/ فدان وكذلك التفاعل بينهما على المحصول ومكوناته لبعض التراكيب الوراثية للأرز SK2034H ، SK2046H ، جيزة ١٧٨ تحت ظروف الأرض الملحيه بمزرعة السرو. وقد تم استخدام تصميم القطع المنشقه مرتين فى اربع مكررات حيث وزعت الأصناف فى القطعع الرئسيه ومعدلات التسميد النيتروجينى فى القطع الشقيه الأولى بينما وزعت معدلات التسميد البوتاسى فى القطع الشقيه الثانيه .

وكان من اهم النتائج المتحصل عليها :

وجود فروق معنويـه بين الأصـناف فـى كـل الصـفات المدروسـه كمـا أثـرت مسـتويات التسـميد النيتروجينى معنويا على كل من طول النبات (سم) ، وعدد الأفرع/ م٢ وطول الداليه (سم) ، وعدد الداليات /م٢، وعدد الحبوب الممتلئه /الداليه ، وعدد الحبوب الفارغه / الداليه، ووزن الدالية (جم) ، وزن الألف حبه (جم) ، ومحصول الحبوب ، ومحصول القش طن / فدان . كما اثرت مستويات البوتاسيوم معنويا على كل الصفات تحت الدراسه .

واو ضـخت النتـائج استجابة كل الأصـناف لزيـادة معـدلات التسـميد النيتروجينـى حتـى ٧٠ كجـم / فدان ، كمـا اوضحت ايضا استجابة كل الأصناف لزيادة معدلات التسميد النيتروجينى مـع التسميد البوتاسى حتـي ٤٨ كجم بو١٢/ فدان فى كل الصفات المدروسة. وكان للتفاعلات الثنائية تاثير معنوي علي بعص الصفات المدروسة.

ويمكن التوصية بزراعة هجين مصرى ١ مع التسميد بمعدل ٤٨ كجم بو٢أ/فدان مع ٧٠ كجم /فدان تحت ظروف الأراضى الملحيه المماثله للحصول علي انتاجية مرضية تحت مثل هذة الظروف.

قام بتحكيم البحث

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