J. Agric. Sci. Mansoura Univ., 32 (8): 6895 - 6906, 2007

EFFECT OF PHOSPHORUS AND POTASSIUM ON THE YIELD AND QUALITY OF COTTON PLANT GROWN IN DAMIETTA GOVERNORATE

Rahmou,A.A.;M.H.El-Kholy, Sh.Z.Saleh and M.M.El-Zeky
Soils, Water and Environment Res. Institute, Agric. Res.Center Giza, Egypt

ABSTRACT

Tow field experiment, were conducted at El-Serw Agricultural Experiment Station, Damietta Governorate, to study the effect of phosphorus fertilizer levels (0, 15, 30 and 45 kg P_2O_5/fed.), potassium fertilizer levels (0, 24, 48 and 72 Kg K_2O/ fed.) and their combinations on cotton plant. Vegetative samples from the first full mature leaf were taken just preflowering to determine N, P and K concentrations.

Some yield components (number of open bolls /plant, boll weight, seed plant index and oil with lint percentages) and cotton yield (seed cotton yield, seed yield, lint yield and oil yield) were determined.

Obtained results can be summarized as follows:

1- Phosphorus or potassium application increased significantly nitrogen, phosphorus and potassium concentrations in cotton leaves , while combination with each other did not significantly.
2- Number of open bolls/ plant , boll weight , seed index , oil percentage lint percentage ,seed cotton yield, seed yield, lint yield and oil yield were increased significantly by phosphorus or potassium application either alone or in combination with each other in both the two seasons ,while number of open bolls /plant was not affected significantly in the second season. The highest rate of phosphate (45 Kg P_2O_5 /fed.) and potassium (72 Kg K_2O/ fed.) recorded the maximum responses.
3- No significant differences were found between the highest two rates of P and K fertilizer on the above mentioned measurements.
4- Lint and oil percentages were correlated significantly with nitrogen , phosphorus and potassium concentrations.
5- It is concluded that application of (65 Kg N/ fed. + 30 Kg P_2O_5/fed.+48 Kg K_2O/fed.) was the best treatment for cotton grown in salt affected soils in the north of Delta.

INTRODUCTION

Cotton (*Gossypium barbadense L*.) is the most important agricultural crop in Egypt. It is still the main cash crop for a sizable section of Egyption farmers . Besides, it is the main raw material for the largest national industry, the textile industry, as well as the main source of locally produced cotton seed oil therefore continuous efforts have been directed towards ,increasing production and improving its quality through the optimum fertilizer treatments.

It is well known that plants take up phosphorus in smaller amounts than nitrogen or potassium. However, phosphorus is the second key plant nutrient has an important role in cell devision, in stimulation of early root growth, in hastening plant maturity, in energy transformution within the cells and in fruiting and seed production.

Phosphorus applications hasten the ripening processes thus produc the same effect as a deficiency of water but to a less extent and consequent

by reductes the vegetative growth(Russell, 1961). Thus, the use of phosphorus or other practices for vegetative control could been essential part of cotton production scheme because without vegetative control (especially under high soil fertility and suitable moisture conditions), higher plant population and narrow rows will intensity the hazards caused by excessive vegetative growth. Kevin *et al.*(2003) found that phosphorus fertilizer did not affect lint yields, but it responded to variable rate in the next year. Xinhua and Tony (2001) found that seed oil concentrations were increased by potassium banding and were often positively correlated with leaf content of K, seed content of K and seed yield. Howard *et al.* (2001) found that the critical P rate was 39 Kg P/ha and that of K was 56 Kg/ha. They also reported that petiole and leaf P concentrations increased with P fertilizer application, K concentrations were reduced by P fertilizer application. Gohar (2006) found that P addition increased N-content in cotton leaves and stems, He also reported that the 24,48 and 72 Kg KO_2 /fed. increased N-content in leaves and stems. Similar results were obtained by Datey *et al.* (1994), Mangal – Prasad (2000), Sasthri *et al.* (2001) and Bi *et al.* (2005).

The objective of this work is to evaluate the effect of phosphorus and potassium application and their interactions on both of seed cotton yields and its quality.

MATERIALS AND METHODS

Tow field experiments were carried out during 2004 and 2005 growing seasons at El-Serw Research Station, Damietta Governorate, to study the effect of both phosphorus and potassium fertilizers and their interactions on the Egyptian cotton grown in salt affected soils in north of Delta, Egypt.

Some physical and chemical charactristics of the experimental soil samples are given in Table (1). A Split plot design with four replicates was used, the main plots were arranged for potassium fertilizer rates 0,24,48 and 72 kg K_2O/fed, while sub plots were devoted to phosphorus fertilizer rates, (0,15,30 and 45 kg P_2O_5/fed.). Cotton seed (*Gossypium barbadense* L.) variety Giza 86 were sown on March 25th and April 1 st in the two seasons respectively. The plot area was 10.5 m^2, which contained five rows, 3.5 meter long and 60 cm apart. Plants were thinned to leave two plants per hill. Phosphorus fertilizer treatment in the form of superphosphate (15.5% P_2O_5) were added before sowing, while potassium fertilizer treatments in the form of potassium sulphate (48% K_2O), and nitrogen fertilizer in the form of ammonium nitrat (33.5% N) at the rate of 65 Kg N/fed. were applied in two equal doses, after thinning and before the second irrigation. A samples of the youngest fourth fully matured leaf on the main stem was taken at full flowering [according to Walsh and Beaton, (1977)] ,to determine nutrients concentrations as described by Jackson (1973). Number of open bolls per plant, boll weight, seed index (100-seed weight), lint percentage, oil percentage, seed cotton yield, lint yield, seed yield and oil yield per feddan were recorded.

Soil contents of available macronutrients were determined as described by Chapman and Pratt (1961) and seed oil was determined according to A.O.A.C (1980).

The obtained data were subjected to statistical analysis according to Sndecor and Cochran (1981).

Table (1) Same physical and chemical properties of the soil sample.

Soil characteristics	1st season	2nd season
Course sand %	1.33	1.52
Fine sand %	10.85	10.10
Silt %	24.10	23.50
clay %	63.72	64.88
soil texture	clayey	Clayey
calcium carbonate %	1.35	1.48
organic matter %	1.20	1.32
PH (1 soil : 2.5 water suspension)	8.1	8.2
EC dS/m(1 soil:5 water extract)	5.8	4.4
Available nutrients (mg kg^{-1}):		
P (0.5 N sodium bicarbonat extract)	8.3	7.8
K (1 N ammonium acetate extract)	480	430

RESULTS AND DISCUSSION

The obtained results will be discussed as the average of the two growing seasons 2004 & 2005 and they were tabulated as follows:

I- Effect of phosphorus levels:

Data presented in (Table, 2-a), showed that seed cotton, seed, lint and oil yields of cotton were significantly increased by increasing rate of the applied P. In this connection, the addition of 45 kg P_2O_5/fed gave the highest increment percentages as compared with the check treatment i.e. 15.6, 13, 20 and 17.5% for seed cotton , seed, lint and oil yields as means of two seasons, respectively.

The percentages of Lint and oil in both seasons gave also the same trend (Table 2,b), the addition of 45 kg P_2O_5/fed achieved the highest increments compared with the control i.e. 4 and 5% for lint and oil as means of the two seasons. However the rate of 30 Kg P_2O_5/fed. achieved the highest increment(4.3) in lint in the first season.

Also data in (Table, 2, c) showed that seed index, boll weight and number of open bolls/plant significantly increased with increasing P levels and the addition of 45 Kg P_2O_5/fed. gave the highest increment over the control by 13, 17 and 19%, respectively as means of two seasons.

N,P and K cancentrations in the youngest fourth fully matured leaf on the main stem take also the same trend (Table, 2-d) they were increased by 7.6, 10.59 and 10.3% for N, P and K as means of two seasons, respectively, over the control due to the application of 45 Kg P_2O_5 / fed.

Table (2) Effect of different phosphorus levels (kg P_2O_5/fed.) on cotton yields, lint and oil percentages, yield components and N,P and K concentrations in the fourth leaf at flowering stage

a-Cotton yields

Treatments	Seed cotton yield (Kg/fed.)			Seed yield (Kg/fed.)			Lint yield (Kg/fed.)			Oil yield (Kg/fed.)		
	2004	2005	Mean	2004	2005	Mean	2004	2005	Mean	2004	2005	Mean
0	893.75	915.00	904.4	566.70	576.70	571.7	327.05	338.30	332.7	101.43	105.94	103.7
15	940.08	975.67	957.9	590.88	609.64	600.3	349.20	366.03	357.7	110.06	113.19	111.6
30	1020.8	1052.5	1036.7	630.35	650.98	640.7	390.15	401.52	395.8	117.77	118.03	117.5
45	1026.8	1063.5	1045.2	637.25	654.27	645.8	389.46	409.23	399.2	120.12	121.2	120.5
L.S.D5%	10.055	10.103		7.281	6.615		3.515	3.876		0.632	1.948	

b- Lint & Oil percentages

Treatments	Lint %			Oil %		
	2004	2005	Mean	2004	2005	Mean
0	36.58	36.97	36.8	18.47	18.36	18.4
15	37.10	37.49	37.3	18.77	18.65	18.7
30	38.17	38.08	38.1	19.48	19.13	19.3
45	37.93	38.46	38.2	19.56	19.26	19.4
L.S.D 5%	0.21	0.138		0.139	0.15	

c- Yield components

Treatments	Seed index (g)			Boll weight (g)			No. of open bolls /plant		
	2004	2005	Mean	2004	2005	Mean	2004	2005	Mean
0	7.95	8.13	8.04	2.4	2.38	2.4	8.75	9.08	8.9
15	8.43	8.45	8.40	2.56	2.58	2.6	9.42	9.83	9.6
30	8.79	8.97	8.90	2.69	2.74	2.7	10.00	105.	10.3
45	9.04	9.19	9.10	2.74	2.77	2.8	1058.	1067.	106.
L.S.D 5%	0.135	0.108		0.088	0.08		0.75	0.981	

d-Nutrient concentrations

Treatments	N %			P %			K %		
	2004	2005	Mean	2004	2005	Mean	2004	2005	Mean
0	2.455	2.469	2.462	0.368	0.418	0.393	2.892	2.814	2.853
15	2.523	2.540	2.532	0.411	0.418	0.415	2.911	2.930	2.921
30	2.623	2.613	2.618	0.589	0.473	0.481	3.051	2.929	2.990
45	2.647	2.650	2.649	0.616	0.481	0.499	3.173	3.123	3.148
L.S.D 5%	0.0189	0.022		0.0175	0.0289		0.129	0.128	

2- Effect of potassium levels:

Data obtained in (Table, 3 - a) revealed that seed cotton, seed, lint and oil yields of cotton were significantly increased by increasing the level of K up to 72 Kg K_2O/ fed. In this respect, the differences between the levels of 48 kg K_2O/fed. and 72 Kg K_2O /fed. did not reach the level of significant in the seed cotton and lint yield Kg / fed. in the 2nd season. The addition of 72 Kg K_2O/fed.gave the highest increments compared with the check treatment i.e. 15, 14, 18, 21% for seed cotton , seed, lint and oil yields as means of two seasons, respectively.

On the other hand (table , 3-b-c) showed that increasing K application up to 72 Kg K_2O/fed induced significant increase in lint%, oil%, seed index, Boll weight and the highest values were obtained by using 72 Kg K_2O/fed. Although the treatment of applying 72 Kg K_2O/fed which recorded

the highest values of all studied cotton characters. It was noticed that there were no significant differences between using 48 Kg K_2O/fed and 72 Kg K_2O/fed, so we can recommend that using 48 Kg K_2O/fed most compatible.

Data in (Table, 3-d) clearly indicated that N,P and K concentrations were significantly affected by application of K fertilization. The differences between the levels of 48 and 72 kg K_2O/fed did not rich the level of significances in P% in the 2nd season. The addition of 72 Kg K_2O / fed .achieved the highest increment compared with the control i.e. 11, 19 and 15% for N,P and K as means of the two seasons.

Table (3) Effect of different potassium levels (kg K_2O/fed.) on cotton yields, lint and oil percentages, yield components and N,P and K concentrations in the fourth leaf at flowering stage, respectively.

a-Cotton yields

Treatments	Seed cotton yield (Kg/fed.)			Seed yield (Kg/fed.)			Lint yield (Kg/fed.)			Oil yield (Kg/fed.)		
	2004	2005	Mean	2004	2005	Mean	2004	2005	Mean	2004	2005	Mean
0	882.25	929.0	905.6	558.11	583.36	570.7	324.1	345.64	334.9	105.20	104.70	105.0
24	941.75	966.08	953.9	589.17	603.18	596.2	352.58	362.90	357.7	110.96	111.80	111.4
48	1030.4	1054.3	1042.4	636.08	651.33	643.7	394.33	402.93	398.3	123.26	125.53	124.4
72	1026.9	1057.3	1042.1	641.83	653.73	647.8	385.1	403.61	394.3	124.95	128.32	126.6
L.S.D 5%	2.401	4.757		3.086	3.246		1.1	2.498		1.549	1.732	

b- Lint & Oil percentages

Treatments	Lint %			Oil %		
	2004	2005	Mean	2004	2005	Mean
0	36.69	37.18	36.9	18.17	17.93	18.1
24	37.4	37.54	37.5	18.68	18.53	18.7
48	38.22	38.11	38.2	19.43	19.33	19.4
72	37.46	38.17	37.8	19.99	19.60	19.8
L.S.D 5%	0.167	0.158		0.079	0.213	

c- Yield components

Treatments	Seed index (g)			Boll weight (g)			No. of open bolls /plant		
	2004	2005	Mean	2004	2005	Mean	2004	2005	Mean
0	7.67	7.86	7.8	2.55	2.51	2.53	8.83	8.67	9.3
24	8.43	8.57	8.5	2.53	2.59	2.56	9.25	9.25	9.3
48	9.01	9.1	9.1	2.74	2.78	2.76	10.92	10.42	10.2
72	9.1	9.22	9.16	2.78	2.78	2.78	10.75	10.75	10.8
L.S.D 5%	0.076	0.047		0.066	0.058		1.076	0.794	

d-Nutrient concentrations

Treatments	N %			P %			K %		
	2004	2005	Mean	2004	2005	Mean	2004	2005	Mean
0	2.474	2.248	2.361	0.480	0.475	0.478	2.750	2.809	2.780
24	2.554	2.574	2.564	0.510	0.510	0.510	2.936	2.913	2.925
48	2.597	2.598	2.598	0.553	0.536	0.545	3.092	2.953	3.023
72	2.623	2.618	2.621	0.571	0.569	0.570	3.250	3.121	3.186
L.S.D 5%	0.009	0.0136		0.0058	0.053		0.0203	0.142	

3- Interactions effects:

Effects of the interactions between P and K fertilizers are presented in (Table 4-a, b, c). Data showed that seed cotton yield, seed yield, lint yield, oil yield, lint%, oil%, seed index , boll weight and number of open bolls/plant were significantly, affected by the interaction between P and K while there were no significant effect with respect to number of open bolls/plant in the 2nd season.

The maximum values were recorded with (72 Kg K_2O/fed + 30 kg P_2O_5/fed.) for all measured characters: seed cotton yield, seed yield, lint yield, oil yield, lint & oil percentages and boll weight. On the other hand the maximum values for seed index was achieved with (48 kg K_2O/fed + 30 kg P_2O_5/fed.).

Table (4) Cotton yields, lint & oil percentages and yield components as affected by different levels of phosphorus under different levels of potassium

a- Cotton yields (Kg/fed.)

Treatments		Seed cotton yield (Kg/fed.)			Seed yield (Kg/fed.)			Lint yield (Kg/fed.)			Oil yield (Kg/Fed.)		
K Kg/fed	P Kg/fed	2004	2005	Mean	2004	2005	Mean	2004	2005	Mean	2004	2005	Mean
0	0	813.33	860.67	837	521.43	544.80	533	291.9	315.87	304	93.18	96.07	95
	15	897.00	919.33	908	573.20	579.83	577	323.8	339.50	332	102.02	103.03	101
	30	898.67	946.00	922	564.57	596.00	580	333.1	350.00	342	103.3	106.30	103
	45	920.00	990.00	955	573.33	612.80	593	346.77	377.20	362	107.2	113.40	110
24	0	913.33	927.33	920	579.63	583.30	581	333.7	344.03	339	104.53	104.80	105
	15	929.33	946.00	938	582.70	596.30	590	346.63	349.70	348	107.57	108.53	108
	30	945.00	980.33	963	586.83	610.07	599	358.17	370.27	364	111.67	115.30	113
	45	979.33	1010.70	995	607.50	623.07	615	371.83	387.60	380	116.47	118.60	118
48	0	921.00	941.00	931	580.53	592.20	586	340.47	348.80	345	108.73	111.30	110
	15	988.33	1021.70	1005	612.80	632.73	623	375.53	388.93	382	116.83	118.20	118
	30	1088.00	1103.70	1096	654.63	677.67	666	433.37	426.00	430	129.77	133.27	132
	45	1124.3	1150.70	1138	696.37	702.70	700	427.97	447.97	438	139.73	139.37	140
72	0	927.33	931.00	929	585.20	586.50	586	342.13	344.5	343	114.37	111.60	113
	15	945.66	1015.70	981	594.83	629.70	612	350.83	385.97	368	117.40	123.00	120
	30	1151.3	1180.00	1166	715.37	720.20	718	435.97	459.80	448	148.30	145.23	147
	45	1083.3	1102.70	1093	671.90	678.50	675	411.27	424.17	418	136.40	133.43	135
L.S.D .5%		20.109	20.205		14.561	13.23		7.029	7.753		3.099	3.895	

Discussion and Conclusion

1- Seed cotton, seed, lint and oil yields of cotton were positively affected with P and K fertilization. In this respect P was the most effective element followed by potassium this was because of the high available K in the soils under investigation (Table 1).

The enhancing impacts of P and K fertilization on seed cotton, seed, lint and oil yields of cotton may be due to the essential role of these nutrients for cotton growth at different stages through building up proteins and protoplasm, encouraging cell division and meristematic tissues as well as storage and transfer of energy necessary for metabolic processes.

b-Lint & Oil percentages.

Treatments		Lint %			Oil %		
K(kg fed)	P(kg/ fed)	2004	2005	Mean	2004	2005	Mean
0	0	35.90	36.70	36.3	17.87	17.63	17.8
	15	36.10	36.93	36.5	17.80	17.77	17.8
	30	37.07	37.00	37.0	18.30	17.83	18.1
	45	37.70	38.10	37.9	18.70	18.50	18.6
24	0	36.53	37.10	36.8	18.07	17.97	18.0
	15	37.30	36.97	37.1	18.47	18.20	18.3
	30	37.90	37.77	37.8	19.03	18.90	19.0
	45	38.00	38.33	38.2	19.17	19.03	19.1
48	0	37.00	37.07	37.0	18.73	18.80	18.8
	15	38.00	38.07	38.0	19.07	19.10	19.1
	30	39.80	38.60	39.2	19.83	19.60	19.7
	45	38.06	38.93	39.5	20.07	19.83	20.0
72	0	36.90	37.00	37.0	19.20	19.03	19.1
	15	37.10	38.00	37.6	19.73	19.53	19.6
	30	37.87	38.97	38.4	20.73	20.17	20.5
	45	38.00	38.47	38.2	20.30	19.67	20.0
L.S.D 5%		0.419	0.276		0.278	0.301	

C-Yield components

Treatments		Seed index (g)			Boll weight (g)			No. of open bolls /plant	
K (Kg/ fed)	P (Kg/fed)	2004	2005	Mean	2004	2005	Mean	2004	2005
0	0	7.20	7.37	7.3	2.17	2.13	2.2	7.00	9.2
	15	7.57	7.73	7.7	2.23	2.30	2.3	7.00	9.6
	30	7.57	7.90	7.7	2.40	2.33	2.4	8.00	9.5
	45	8.33	8.43	8.4	2.60	2.46	2.5	9.33	9.8
24	0	7.77	8.20	8.0	2.33	2.40	2.4	8.00	9.0
	15	8.20	8.20	8.2	2.43	2.63	2.5	8.67	8.8
	30	8.63	8.57	8.6	2.67	2.53	2.6	8.33	9.1
	45	9.13	9.30	9.2	2.67	2.80	2.7	10.00	10.0
48	0	8.37	8.30	8.3	2.53	2.47	2.5	7.67	9.8
	15	8.80	8.83	8.8	2.77	2.63	2.7	10.33	9.2
	30	9.53	9.77	9.7	2.73	3.07	2.9	11.33	10.0
	45	9.33	9.50	9.4	2.93	2.97	3.0	10.33	10.8
72	0	8.47	8.67	8.6	2.57	2.53	2.6	8.33	10.7
	15	9.13	9.03	9.1	2.80	2.73	2.8	11.33	9.0
	30	9.43	9.63	9.5	2.97	3.03	3.0	11.67	10.5
	45	9.37	9.53	9.5	2.77	2.83	2.8	12.67	10.2
L.S.D 5%		0.269	0.215		0.175	0.161		1.499	ns

In addition, these nutrients increase cell number and size, length of the internodes of the main stem and produce more sizeable organs with on overall increase in plant growth. Also, these results could be attributed to the direct impact of phosphorus an enzymatic reactions that depend on phosphorylation, These results showed great similarity to those obtained by Abd El-Latif *et al.* (2004), Sarkar and Majumdar (2002) and Gohar (2006) who came to similar results. El Mallah and Emam (1998) found that there were no significant effect due to P and K application on seed cotton yield at the first season However, at the second season, it increased significantly.

Lint yield was a reflection for the increases in boll size and boll number (Motocha *et al.* 1994).

2- Oil percentage in seed significantly increased by increasing P levels. This could be attributed to the importance of P to improve the seed size and its filling. Abd El latif et al (2004) found that P at at a rate at 30 Kg P_2O_5/fed. gave the highest oil yield and increased oil percentage by 9.55% campared to control. Also, data showed that the treatment 30 Kg P_2O_5/fed + 72 Kg K_2O/fed resulted in high oil% and oil yield. These increses were expected because of increasing the corresponding values of seed yield and the effect of nutrient balance in soil on seed yield of cotton plant. These results are in the line with those of El-Mallah and Emam (1998).

3- Lint and oil percentages were correlated significantly with each of nitrogen, phosphorus and potassium concentrations in cotton leaves (Figs.1 and 2).

4- Seed index, boll weight and number of open bolls / plant increased significantly by increasing P and K levels. On the other hand, El-Mallah and Emam (1998) Stated that seed cotton yield and seed index significantly increased with addition of 22.5 Kg P_2O_5/fed more than the application of 45 Kg P_2O_5 + 24 Kg K_2O/fed . Abd–El-Aal *et al.* (1990) found that increasing P from 15 to 30 Kg P_2O_5/fed. and 24 to 48 Kg K_2O/fed. increased boll weight, number of open boll weight, lint% and seed cotton yield.Sabino *et al.*(1999) formed that application of K fertilizer increased boll weight and 100–seed weight. Lint yield was reflected by an increase in boll size and boll number (Motocha *et al.*1994).

5- The application of P and K stimulates the absorbtion of the added nutrient and also the other ones as well as increases their concentration in the youngest forth fully mature leaf on the main stem at full flowering because of contribution of these nutrients in plant vital processe. Such as protein and carbohydrate construction, cell division and expansion as well as respiration and photosynthesis. These results are in harmony with obtained by Abdel Hadi *et al.* (1987). Gohar(2006) found that K-addition at rates of 24,48 and 72 Kg K_2O/fed. those significantly enhanced P uptake in leaves and stem in both seasons. In the same, Abd El-Latif *et al.* (2004) found that N and K percentages and there uptake by cotton seeds increased with increasing P levels. These results may be due to the effect of P on growth and consequently the efficiency of the root in absorbing various nutrients. These results are in agreement with those reported by found that K concentration in petiole of cotton increased due to K treatments. Katkar *et al.* (2000) found that N, P and K uptake in cotton plantincresed with increasing N,P and K rate.

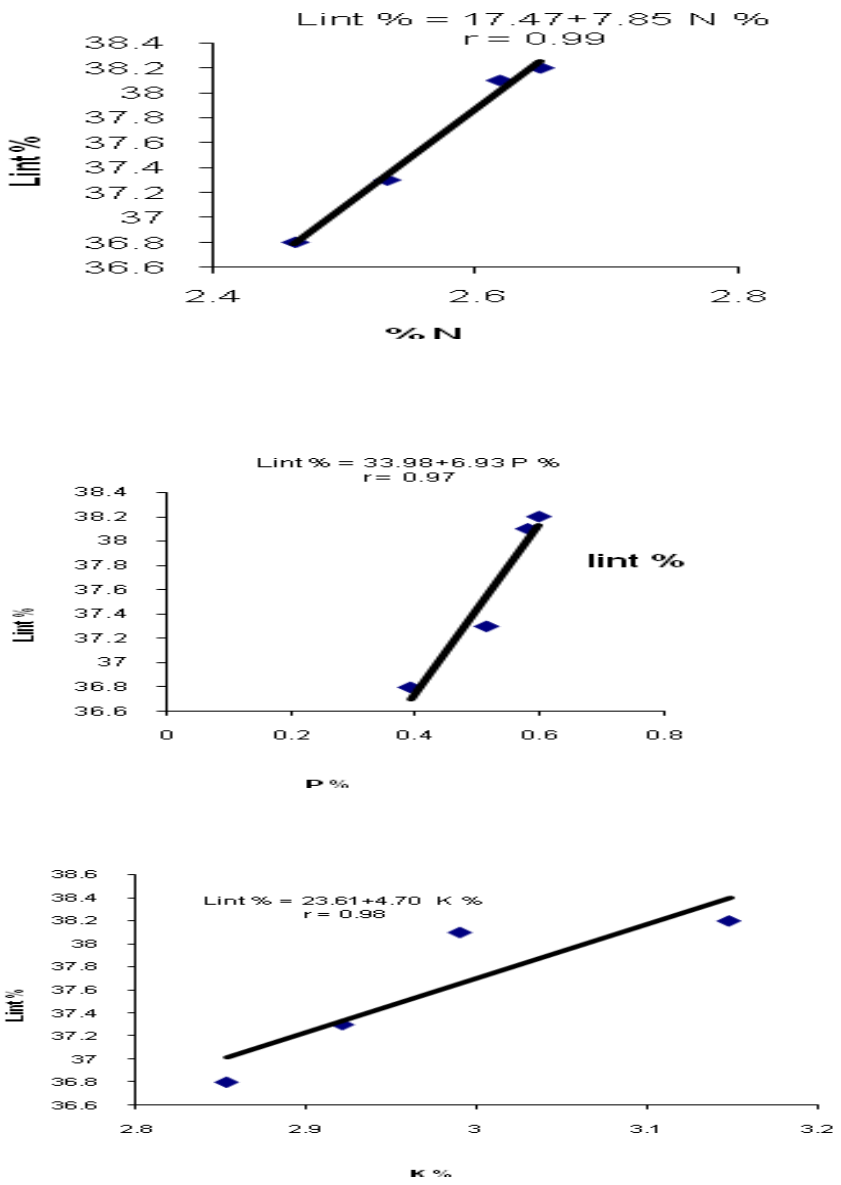
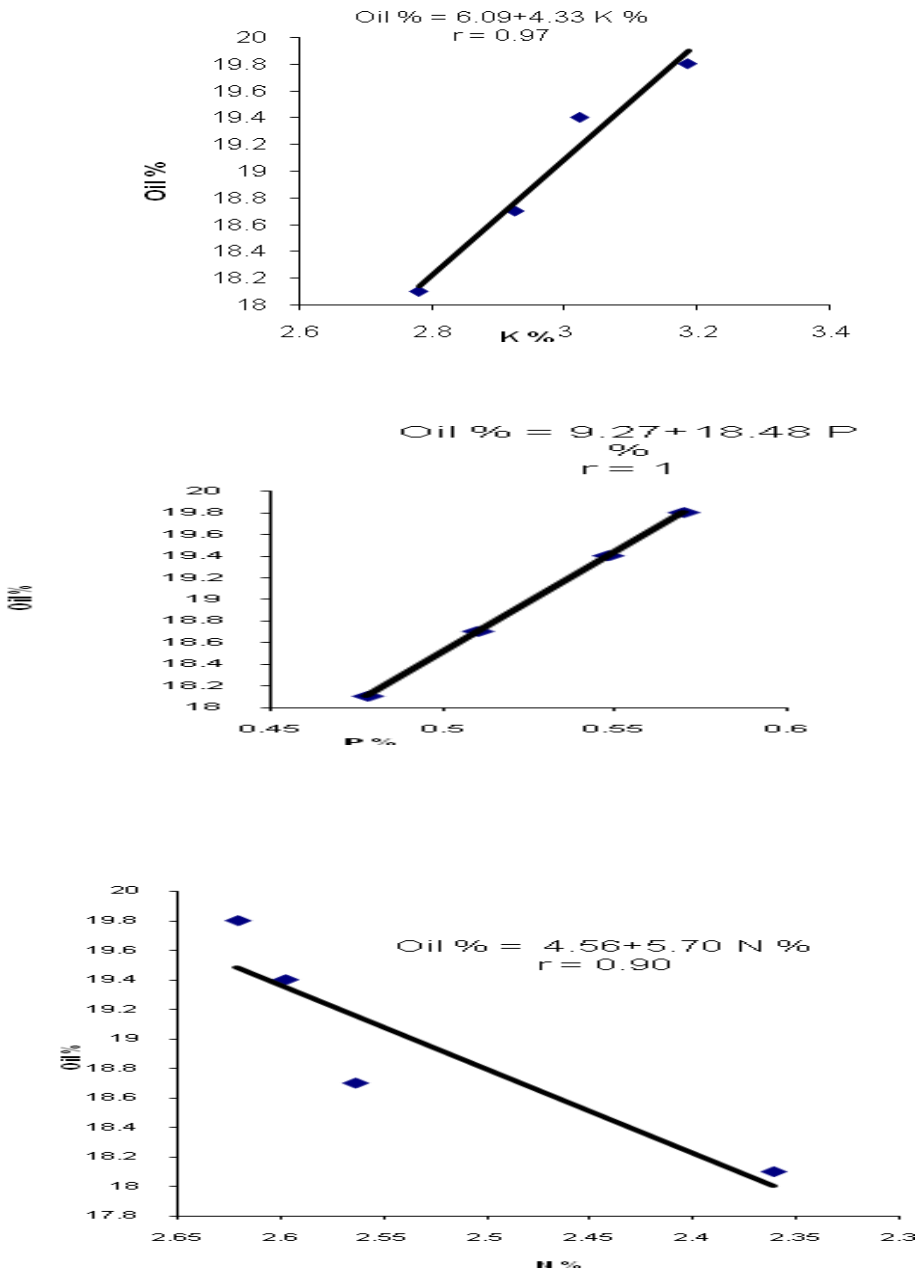


Fig (1) Correlations coefficience between some nutrients concentrations in leaves and lint %.



Fig(2):Correlation Coefficience between some nutrients concentration in leaves and oil %.

So, under the present experimnts, it worth to mention that the best formula of N, P & K fertilization for producing cotton yields and maximize oil percentage were : 65 kg N, 30 Kg P_2O_5 and 48 Kg K_2O/fed.

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تأثير الفوسفور والبوتاسيوم على محصول القطن وجودتة فى أراضى محافظة دمياط

عادل عبده رحمو، محمود حسن الخولي، شاكر زيد صالح و محمد محسن الزكى
معهد بحوث الأراضى والمياه والبيئة-مركز البحوث الزراعية- الجيزة- مصر

أقيمت تجربتان حقليتان بمحطة البحوث الزراعية بالسرو محافظة دمياط خلال موسمي الزراعة (2004& 2005)على محصول القطن صنف جيزة 86 .لدراسة أثر أضافة الفوسفور(صفر ، 15 ، 30 ، 45 كجم فو2أ5/ فدان) على صورة سوبرفوسفات الكالسيوم 15.5% والبوتاسيوم (صفر ، 24 ، 48 ، 72 كجم بو2 أ / فدان) على صورة سلفات البوتاسيوم 48% بو2 أ وأضافتهما معا. ويمكن تلخيص النتائج المتحصل عليها فيما يلي :

1-أدى أضافة السوبرفوسفات أو سلفات البوتاسيوم كل على حدة الى زيادة معنوية فى تركيزات النيتروجين والفوسفوروالبوتاسيوم فى أوراق القطن ؛ بينما أضافنهما معا كانت الاستجابة غير معنوية .

2- عدد اللوز المتفتح / نبات ووزن اللوزة ودليل البذرة والنسبة المئوية للشعروالزيت و محصول القطن الخام ومحصول الشعر ومحصول البذور ومحصول الزيت زادت زيادة معنوية بأضافة السوبرفوسفات أو سلفات البوتاسيوم كل على حدة أو أضافنهما معا خلال موسمى النمو؛ بينما عدد الوز/ نبات كانت الأستجابة غير معنوية فى السنة الثانية ؛ أعلى معدل لكل من السوبرفوسفات أو سلفات البوتاسيوم قد سجل أعلى أستجاية للقياسات السابق ذكرها.

3- لم توجد أى فروق معنوية بين أعلى معدلين لكل من السوبرفوسفات أو سلفات البوتاسيوم فى القياسات السابق ذكرها.

4- النسبة المئوية للشعروالزيت أرتبطت معنويا بتركيزات النيتروجين والفوسفوروالبوتاسيوم فى أوراق القطن.

5-وبناء على هذه الدراسة نوصى بتسميد القطن , طبقا لتحليل نتائج التربة فى محطة البحوث الزراعية فى السرو بمحافظة دمياط بالمعادلات التالية: 65 كجم نيتروجين/فدان +30 كجم فو2أ5/فدان +48 كجم بو2 أ/فدان.