Effect of Enriched Rock Phosphate, Bio-Compost on K, Ca, Mg and Na Content in Maize Crop under South Gujarat Condition

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Abstract: ***Field experiment was conducted college farm, Navsari, Agricultural University, Navsari during 2015-16 and 2016-17 to study effect of enriched rock phosphate, bio-compost and on K, Ca, Mg and Na content in Maize crop under south Gujarat condition. Application of different phosphorus fertilizer in soil either though SSP, RP with AM fungi increased total potassium content in maize grain and straw, but it was non-significant in the year 2015-16 and pooled analysis. Potassium content in maize cover and grain, cob was significantly higher during the years 2015-16 and 2016-17 respectively. Significantly higher K in maize grain was observed during second year with the application of 100%P as RP+AM (T_{12}) treatments. Similar calcium content in maize grain in the year 2015-16, calcium content in maize cob during 2016-17 and calcium and magnesium content in maize cob and straw respectively, during pooled analysis was found to be significant. The results indicated that the total potassium, calcium, magnesium and sodium in maize silk was not reached at the level of significant during 2015-16, 2016-17 and pooled.***

Keywords: Rock phosphate (enriched compost) and (K, Ca, Mg and Na) contents in maize

1. Introduction

In India, it is the ranks fourth after rice, wheat and sorghum. Maize is principal staple food in many countries, particularly in the tropics and subtropics and it is using for both type as food for human and fodder for animals and also necessary by the various industries. In India, about 35% of the maize produced is used for human consumption, 25% each in poultry feed and cattle feed and 15% in food processing like corn flakes, pop corn etc., and in other industries mainly starch, dextrose, corn syrup and corn oil etc (FAI, 1999). Maize one of the mycotrophic plant and required to its high nutrient demand frequently benefits from mycorrhizal symbiosis. In India, most of the soils are either deficient or insignificant in P status. sufficient P fertilization is thus essential for economic and sustained crop production. Phosphorus deficient soils require heavy dose of phosphatic fertilizers which are imported and expensive. The low P soils, improvement in plant growth by mycorrhizal fungi appears as high levels of mycorrhizal infection are attained Lu *et al*, (1994). Kothari *et al*, (1990) reported that the role of mycorrhizae in the acquisition of Ca and Mg from soil is probably very small because they are transported preferentially by mass flow of the soil solution to the roots from this reason that the Ca and Mg was least affected by mycorrhizal inoculation. The Zn and Cu can be absorbed and translocated through VAM hyphae and then released to the host. Liu *et al*. (1999) reported inoculation of VAM increased the uptake of fraction of Olsen-P, Ca_2P, Ca_8P, $AlPO_4$. From the present experiment to study the effect of enriched rock phosphate, bio-compost and on K, Ca, Mg and Na content in Maize crop under South Gujarat condition.

2. Material and Methods

The field experiment was conducted at the College Farm, Navsari Agricultural University, Navsari in the year 2015-16 and 2016-17. To study the effect enriched rock phosphate, bio-compost and on Ca, Mg and Na content in different part of maize crop under South Gujarat during 2015-16 and 2016-17. The treatments consisted for the study *viz* T_1: *Rabi* Fallow T_2: Absolute control, No fertilizer and AM, T_3: 50% P as R, T_4: 50% P as RP +AM, T_5: 50 % P as SSP, T_6: 50 % P as SSP+ AM, T_7: 75% P as RP, T_8: 75% P as RP +AM, T_9: 75% P as SSP, T_{10}: 75% P as SSP +AM , T_{11}: 100 % P as RP, T_{12}: 100 % P as RP+ AM, T_{13}: 100% P as SSP and T_{14}: 100% P as SSP+ AM in *rabi* maize as main plot treatments which replicated for three times in randomized block design. and summer green gram split plot with two level of RDF F_1: (75%RDF) and F_2: (100%RDF) thought urea 20 kg/ha and SSP 40 kg/ha respectively . Soil of the experimental field was clayey in texture, slightly alkaline in reaction (pH 7.8), Electrical conductivity 0.145 (dS/m) at 25 C and low in organic carbon (0.44%) and available nitrogen (206.5 kg/ha), medium in available phosphorus (38.2 kgha^{-1}) and high in available potassium (323.2 kg/ha). Total available micronutrient content iron (4.18 mg/kg), lower of copper (0.049 mg/kg), 0.264 mg/kg zinc and 6.2 mg/kg of manganese. Properties of the bio-compost (@15 t ha^{-1}) and RP-enriched compost mentioned bellow in the Table 1.

2.1 Micronutrient contents in different part of maize

Plant different part (Straw, grain Silk, Cob, and Cover) after harvesting and ground in willey mill to pass through 40 mesh sieve and plant material (0.5g) was digested in di-acid mixture of HNO_3 and $HClO_4$ (3:1) and K, Ca, Mg and Na content form the plant extract after digestion and volume was direct using Microwave Plasma-Atomic Emission Spectrometer (MP-AES) by Lindsay and Norvell (1978). The data on various variables were analysed by using statistical procedures and pooled analysis of the preceding *rabi* maize analyzed for two years was worked out as per the method described by (Panse and Sukhatme, 1967).

3. Results and Discussion

3.1 Effect of phosphorus management on K, Ca, Mg and Na content in (%) maize straw

The table-2, indicated that different levels of inorganic fertilizer resulted in total potassium (K), calcium (Ca), magnesium (Mg) and sodium (N) content in maize straw was not reached at the level of significant during 2015-16, 2016-17 and pooled analysis except pooled analysis the magnesium content was found to be significant. In pooled result showed that the magnesium content in maize straw was observed T_4 (0.46%) which was significantly higher than other treatments. the data table-2 was also showed that the application of RP and SSP along with AM fungi significantly increased magnesium content in maize straw over control (T_2) plots. Total potassium (K) content in maize straw during both the years of investigation and also in pooled analysis, non-significantly higher of the total potassium was observed with application of (1.03, 1.23 and 1.13 %) in 75% P as RP +AM (T_8) and lower were obtained under (0.62, 1.11 and 0.87 %) in control (T_2). Similar the table-2, indicated that Calcium (Ca), magnesium (Mg) and Sodium (Na) content of maize straw influenced non significantly during 2015-16, 2016-17 and pooled analysis. That may due to the role of *mycorrhizae* in the acquisition of K, Ca, Mg and Na from soil is probably negligible because they are transported preferentially by mass flow of the soil solution to the roots. Kothari *et al.* (1990) reported total uptake of Ca and Mg was least affected by *mycorrhizal* inoculation.

3.2 Effect of phosphorus management on K, Ca, Mg and Na content in (%) maize cover

From the data of table 3, it could be seen that the mean of the calcium (Ca), magnesium (Mg) and sodium (Na) content in maize cover in the both years 2015-16, 2016-17 and pooled analysis did not attain the level of significance but data regarding potassium (K) in maize cover influenced by different treatments presented in Table 3, revealed that (K) content in maize cover the year of 2015-16 was significant. While the year 2016-17 and pooled analysis was not significant. The high value of the potassium (K) in maize cover 0.33 % during 2015-16 was observed in 75% P as RP+AM (T_8) treated plots and lower was in control (T_2) 0.17%. Potassium (K) content in maize cover during 2015-16 and it was at par with 50% P as RP T_3 (0.27%), 50 % P as SSP T_5 (0.32%), 75% P as SSP +AM T_{10} (0.27%) and 100 % P as RP T_{11} (0.25%) treated plots and it was significantly higher as compared to control T_2 (0.17%), 50% P as RP +AM T_4 (0.20%) , 50 % P as SSP+ AM T_6 (0.20%), 75% P as RP T_7 (0.22%), 75% P as SSP T_9 (0.20%), 100 % P as RP+ AM T_{12} (0.19%), 100% P as SSP T_{13} (0.18%) and:100% P as SSP+ AM T_{14} (0.13%) treatments. Similar the result depicted in table-3, regarding the Calcium (Ca), magnesium (Mg) and Sodium content in maize cover was non-significantly influenced by different treatments during both the years 2015-16, 2016-17 and pooled analysis. Kothari *et al.* (1990) reported total uptake of Ca and Mg was least affected by *mycorrhizal* inoculation. Tiwari *et al.* (2005) studied the response of soybean to basal application of P_2O_5. They observed a significant increase in content and uptake of N, P, K and S nutrients due to application of P_2O_5. Phosphorus application, however, decreased the uptake of Ca, Mg, Fe, Zn, Cu and Mn in the plants.

3.3 Effect of phosphorus management on K, Ca, Mg and Na content in (%) maize cob

The potassium (K) content in maize cob in the year 2016-17 and calcium (Ca) content in maize cob during the both years 2015-16 was influenced by the different phosphorus fertilizer treatments but magnesium (Mg) and sodium (Na) content in maize (cob) did not attain the level of significance during both the years and pooled. It is evident from the data in respect of potassium (K) content in maize cob Table-4, revealed in the year of 2015-16 and pooled analysis was not significant. While the year 2016-17 was influence of different phosphorus treatments during the investigation was found be significant. The high value of the potassium (K) in maize cob 1.47 during 2016-17 was observed in 75% P as RP+AM (T_8) treated plots and lower was in control T_2 (0.31%). The potassium (K) content in maize cob T_8 (1.47%) it was at par with T_5 (1.16%) and T_{13} (1.02%) and it was significantly higher than other phosphorus fertilizer and unfertilized treatments during 2016-17. During 2015-16, the highest calcium (Ca) content was recorded in 100 % P as SSP + AM T_{14} (0.12%) and 50% P as RP+AM T_4 (0.12%) which was statistically at par with 50% P as RP T_3 (0.12%),75% P as RP+AM T_8 (0.09%) and 100%P as RP T_{11} (0.08%) and it was significantly higher to control T_2 (0.07%), T_5 (0.07%), T_6 (0.03%), T_7 (0.04%), T_9 (0.04%) T_{10} (0.07%), T_{12} (0.06%) and T_{13} (0.06%) treatments. While the year of 2016-17 significantly higher value of the calcium (Ca) content in maize cob was observed (1.47 %) with the application of 75 % P as RP+AM (T_8) treated plots and it was statistically at par for 50% P as SSP T_5 (0.58%) and 100% P as SSP T_{13} (0.89%) and significantly higher than other treatments. It might be due to the application of RP with AM fungi to *rabi* maize increased total Ca accumulation, with a large reservoir of exchangeable calcium; thus increased Ca content in maize cob. In the years 2015-16, 2016-17 and pooled analysis among different treatments tried in experimental plot, 75% P as RP+AM (T_8) recorded higher magnesium (Mg) content in maize cob which was statistically not significantly Table 4. The magnesium (Mg) content in maize cob was showed 0.06, 1.07 and 0.56 % with the application of 75% P as RP+AM (T_8) treated plot in the both two years of the experiment 2015-16, 2016-17 and average of the pooled analysis. Similar sodium (Na) content in maize (cob) did not attain the level of significance during both the years 2015-16, 2016-17 and pooled analysis.

3.4 Effect of phosphorus management on K, Ca, Mg and Na content in (%) maize grain

The potassium (K), during the year 2015-16 and calcium (Ca), magnesium (Mg) sodium (Na) content in maize (grain) did not reached at the level of significance during both years 2015-16, 2016-17 of the experiments and average of the pooled analysis while potassium in maize grain 2016-17 and calcium (Ca) content in the 2015-16 was found to be significant. In the year 2016-17, it was noted that application 75% P as SSP+AM T_{10} (0.59 %) of potassium (K) content in maize grain which are statistically at par with T_{13} (0.51%) and it was significantly higher among the other phosphorus fertilizer treatments. The potassium content table-5, varied from (0.23%) in control (T_2) to 100%P as RP+AM T_{12} (0.28 %) it was statistically not significant as compared with other treatments during 2015-16. Calcium (Ca) content in maize grain was reaching to the level of significance due to different treatments in the year of 2015-16, T_{10} (0.04 %) of calcium (Ca) content in maize grain was observed it was at par with T_{10} (0.04%) and T_{14} (0.04 %) and it was significantly higher as compared to T_2 (0.02%), T3 (0.01%), T_4 (0.02%), T_5 (0.02%), T6 (0.03%) T_7 (0.02%), T_8 (0.03%), T_9 (0.03%), T_{11} (0.03%) and T_{14} (0.03%). While the second year and pooled analysis calcium content in maize grain was not significant. Similar the magnesium (Mg) and sodium (Na) content in maize grain non-significant However, there was not significantly effect of different treatment in the content of magnesium (Mg) and sodium (Na) in maize grain during the both years of the study 2015-16, 2016-17 and pooled analysis. That might be due to these K, Ca, Mg and Na from soil is most likely insignificant because they are transported preferentially by mass flow of the soil solution to the plant roots.

3.5 Effect of phosphorus management on K, Ca, Mg and Na content in (%) maize silk

The potassium (K), calcium (Ca), magnesium (Mg) and sodium (Na) content in maize (silk) did not attain the level of significance during both the years and pooled (Table 6). That may due to the role of *mycorrhizae* in the acquisition of K, Ca, Mg and Na from soil is probably negligible because they are transported preferentially by mass flow of the soil solution to the roots. Kothari *et al.* (1990) reported total uptake of Ca and Mg was least affected by *mycorrhizal* inoculation. Tiwari *et al.* (2005) studied the response of soybean to basal application of P_2O_5. They observed a significant increase in content and uptake of N, P, K and S nutrients due to application of P_2O_5. Phosphorus application, however, decreased the uptake of Ca, Mg, Fe, Zn, Cu and Mn in the plants. The application of RP + organic manure increased the uptake of major nutrients like N, P, K, Ca and Mg. But the micronutrient uptake was not significant influenced these reported by Kumari and Ushakumari (2002), Rodge, (2010) and Bashirullah *et al.* (2012).

4. Conclusion

Results of the field experimentation significantly higher K in maize grain was observed during 2016-17 with the application of (T_{12}) treatments. Similar significantly higher calcium content in maize grai in the year 2015-16 was higher in (T_{10}) treated plots and calcium content in maize cob in the years 2016-17 significantly higher in (T_{14}) treatment. Calcium and magnesium content in maize cob and straw respectively, during pooled analysis was found to be significant. The results indicated that the total potassium, calcium, magnesium and sodium in maize silk was not reached at the level of significant during 2015-16, 2016-17 and pooled. From the discussion it can be concluded that application of deferent rate of rock phosphate and SSP along with AM fungi to *rabi* maize crop was less affected to the K, Ca, Mg and Na content in maize crop it might be due to that plant root can take these nutrients through the mass flow.

Table 1: Characterization of bio-compost and rock phosphate 2015-16 and 2016-17

Particulars	Properties of in Bio-compost 2015-16	Properties of in Bio-compost 2016-17
pH	6.32	6.02
EC	0.14 (dS/m)	0.15 (dS/m)
Available p	45.3 mg/kg	47.0 mg/kg
Available N	122.6	129.9
Available K	274.8	290.5
Iron (Fe)	10.6	11.6
Copper (Cu)	0.67	0.59
Zinc (Zn)	2.32	2.62
Manganese (Mn)	1.34	4.69
Particulars	Properties of rock phosphate 2015-16	Properties of rock phosphate 2016-17
pH	-	-
EC	-	-
Total P	0.023(%)	0.022(%)
Available N	97.0 mg/kg	90.9 mg/kg
Available K	175.0	180.0
Iron (Fe)	5.60	6.34
Copper (Cu)	1.30	1.09
Zinc (Zn)	1.52	1.41
Manganese (Mn)	1.10	2.12

Table 2: Effect of phosphorus management on Potassium (K) Calcium (Ca), Magnesium (Mg), and Sodium (Na) content in maize straw during 2015-16, 2016-17 and pooled

Treatment	Potassium (%)		Pooled	Calcium (%)		Pooled	Magnesium (%)		Pooled	Sodium (%)		Pooled
	2015-16	2016-17		2015-16	2016-17		2015-16	2016-17		2015-16	2016-17	
T_1	0	0	0	0	0	0	0	0	0	0	0	0
T_2	0.62	1.11	0.87	0.58	0.67	0.63	0.31	0.26	0.29	0.06	0.01	0.03
T_3	0.7	1.13	0.92	1.01	0.65	0.83	0.43	0.33	0.38	0.05	0.01	0.03
T_4	0.77	1.23	1.0	0.66	0.82	0.74	0.54	0.39	0.46	0.06	0.01	0.03
T_5	0.90	1.09	0.99	0.8	0.74	0.77	0.38	0.37	0.37	0.04	0.01	0.02
T_6	0.82	1.38	1.1	0.77	0.65	0.71	0.28	0.31	0.29	0.04	0.01	0.02
T_7	0.61	1.17	0.89	0.78	0.8	0.79	0.34	0.36	0.35	0.03	0.01	0.02
T_8	1.03	1.23	1.13	1.26	0.77	1.02	0.29	0.37	0.33	0.03	0.01	0.02
T_9	0.86	1.14	1.0	0.79	0.69	0.74	0.33	0.37	0.35	0.03	0.01	0.02
T_{10}	0.81	1.40	1.1	0.95	0.8	0.87	0.36	0.44	0.40	0.03	0.01	0.02
T_{11}	0.83	1.15	0.99	0.93	0.72	0.82	0.35	0.36	0.36	0.04	0.01	0.03
T_{12}	0.79	1.15	0.97	0.86	0.69	0.77	0.4	0.37	0.38	0.05	0.01	0.03
T_{13}	0.76	1.09	0.92	0.58	0.66	0.62	0.28	0.33	0.31	0.06	0.01	0.03

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T_{14}	0.79	1.31	1.05	0.7	0.72	0.71	0.34	0.37	0.36	0.05	0.01	0.03
S.Em.±	0.1	0.09	0.07	0.15	0.05	0.08	0.05	0.04	0.03	0.01	0	0.01
C.D at@ 5 %	NS	NS	NS	NS	NS	NS	NS	NS	0.09	NS	NS	NS
S.Em.±												
YXT S.Em.±	—	—	0.09	—	—	0.11	—	—	0.04	—	—	0.01
C.D at @ 5 %	—	—	NS	—	—	NS	—	—	NS	—	—	NS
C.V @%	12.1	12.6	9.4	10.8	11.1	14.3	13.4	10.2	11.9	11.6	12.5	11.2

Table 3: Effect of phosphorus management on Potassium (K) Calcium (Ca), Magnesium (Mg), and Sodium (Na) content in maize cover during 2015-16, 2016-17 and Pooled

Treatment	Potassium (%)		Pooled	Calcium (%)		Pooled	Magnesium (%)		Pooled	Sodium (%)		Pooled
	2015-16	2016-17		2015-16	2016-17		2015-16	2016-17		2015-16	2016-17	
T_1	0	0	0	0	0	0	0	0	0	0	0	0
T_2	0.17	0.23	0.2	0.16	0.11	0.13	0.15	0.10	0.13	0.05	0.08	0.07
T_3	0.27	0.29	0.28	0.19	0.1	0.14	0.19	0.10	0.14	0.05	0.09	0.07
T_4	0.20	0.29	0.25	0.16	0.1	0.13	0.16	0.10	0.13	0.04	0.09	0.06
T_5	0.32	0.31	0.32	0.14	0.14	0.14	0.14	0.12	0.13	0.03	0.09	0.06
T_6	0.22	0.28	0.25	0.23	0.08	0.15	0.23	0.10	0.16	0.05	0.08	0.07
T_7	0.23	0.26	0.25	0.15	0.12	0.14	0.16	0.10	0.13	0.09	0.09	0.09
T_8	0.33	0.27	0.30	0.18	0.14	0.16	0.18	0.13	0.16	0.04	0.06	0.05
T_9	0.20	0.25	0.22	0.21	0.14	0.17	0.21	0.11	0.16	0.04	0.07	0.05
T_{10}	0.27	0.19	0.23	0.21	0.11	0.16	0.21	0.08	0.15	0.02	0.08	0.05
T_{11}	0.25	0.27	0.26	0.17	0.13	0.15	0.17	0.12	0.14	0.15	0.15	0.15
T_{12}	0.19	0.26	0.23	0.19	0.13	0.16	0.19	0.12	0.15	0.06	0.08	0.07
T_{13}	0.18	0.29	0.23	0.18	0.18	0.18	0.18	0.12	0.15	0.04	0.09	0.07
T_{14}	0.13	0.42	0.28	0.15	0.17	0.16	0.15	0.18	0.17	0.04	0.08	0.06
S.Em.±	0.03	0.06	0.03	0.03	0.03	0.02	0.03	0.02	0.02	0.03	0.02	0.02
C.D at@ 5 %	0.09	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
S.Em.±												
YXT S.Em.±	—	—	0.05	—	—	0.03	—	—	0.03	—	—	0.03
C.D at @ 5 %	—	—	NS	—	—	NS	—	—	NS	—	—	NS
C.V @%	14.09	8.61	11.67	11.84	16.77	10.38	8.84	11.65	9.72	13.11	11.82	9.7

Table 4: Effect of phosphorus management on Potassium (K) Calcium (Ca), Magnesium (Mg), and Sodium (Na) content in maize cob 2015-16, 2016-17 and pooled

Treatment	Potassium (%)		Pooled	Calcium (%)		Pooled	Magnesium (%)		Pooled	Sodium (%)		Pooled
	2015-16	2016-17		2015-16	2016-17		2015-16	2016-17		2015-16	2016-17	
T_1	0	0	0	0	0	0	0	0	0	0	0	
T_2	0.16	0.31	0.25	0.07	0.04	0.05	0.05	0.03	0.04	0.02	0.05	0.04
T_3	0.3	0.31	0.31	0.11	0.03	0.07	0.06	0.02	0.04	0.03	0.04	0.03
T_4	0.26	0.59	0.42	0.12	0.43	0.28	0.07	0.41	0.24	0.08	0.05	0.06
T_5	0.23	1.16	0.69	0.07	1.08	0.58	0.05	0.32	0.19	0.05	0.08	0.07
T_6	0.24	0.33	0.28	0.03	0.05	0.04	0.06	0.06	0.06	0.03	0.06	0.05
T_7	0.26	0.33	0.29	0.04	0.04	0.04	0.04	0.04	0.04	0.07	0.05	0.06
T_8	0.22	1.47	0.85	0.09	1.47	0.78	0.06	1.07	0.56	0.03	0.05	0.04
T_9	0.31	0.30	0.30	0.06	0.04	0.05	0.05	0.02	0.04	0.04	0.06	0.05
T_{10}	0.28	0.70	0.49	0.07	0.52	0.30	0.05	0.51	0.28	0.06	0.05	0.05
T_{11}	0.22	0.36	0.29	0.08	0.04	0.06	0.06	0.02	0.04	0.04	0.04	0.04
T_{12}	0.24	0.68	0.46	0.06	0.52	0.29	0.05	0.09	0.07	0.08	0.1	0.09
T_{13}	0.24	1.02	0.63	0.06	0.89	0.47	0.05	0.61	0.33	0.04	0.04	0.04
T_{14}	0.3	0.33	0.32	0.12	0.04	0.08	0.07	0.02	0.04	0.05	0.07	0.06
S.Em.±	0.06	0.23	0.2	0.02	0.28	0.24	0.01	0.26	0.13	0.02	0.02	0.01
C.D at@ 5 %	NS	0.68	NS	0.05	0.83	NS	NS	NS	NS	NS	NS	NS
S.Em.±												
YXT S.Em.±	—	—	0.17	—	—	0.20	—	—	0.18	—	—	0.02
C.D at @ 5 %	—	—	NS	—	—	NS	—	—	NS	—	—	NS
C.V @%	11.6	10.23	8.9	10.1	12.5	11.75	15.9	10.43	10.06	11.79	12.28	11.42

Table 5: Effect of phosphorus management on Potassium (K) Calcium (Ca), Magnesium (Mg), and Sodium (Na) content in maize grain 2015-16, 2016-17 and Pooled

Treatment	Potassium (%)		Pooled	Calcium (%)		Pooled	Magnesium (%)		Pooled	Sodium (%)		Pooled
	2015-16	2016-17		2015-16	2016-17		2015-16	2016-17		2015-16	2016-17	
T_1	0	0	0	0	0	0	0	0	0	0	0	0
T_2	0.23	0.41	0.32	0.02	0.02	0.02	0.13	0.09	0.11	0.09	0.01	0.05
T_3	0.28	0.45	0.36	0.01	0.03	0.02	0.16	0.08	0.12	0.11	0.01	0.06
T_4	0.19	0.49	0.34	0.02	0.03	0.03	0.1	0.1	0.1	0.07	0.01	0.04
T_5	0.19	0.44	0.32	0.02	0.03	0.02	0.1	0.09	0.1	0.09	0.01	0.05
T_6	0.22	0.42	0.32	0.03	0.02	0.03	0.12	0.1	0.11	0.08	0.01	0.04
T_7	0.24	0.38	0.31	0.02	0.02	0.02	0.13	0.1	0.11	0.09	0.01	0.05
T_8	0.24	0.46	0.35	0.03	0.02	0.03	0.13	0.08	0.1	0.09	0.01	0.05
T_9	0.24	0.45	0.34	0.03	0.02	0.03	0.13	0.1	0.11	0.07	0.01	0.04
T_{10}	0.24	0.59	0.41	0.04	0.25	0.15	0.11	0.28	0.2	0.07	0.24	0.16
T_{11}	0.22	0.47	0.35	0.03	0.02	0.03	0.12	0.09	0.11	0.08	0.01	0.04
T_{12}	0.28	0.41	0.34	0.04	0.02	0.03	0.16	0.08	0.12	0.19	0.01	0.1
T_{13}	0.18	0.51	0.34	0.03	0.03	0.03	0.09	0.08	0.09	0.07	0.01	0.04
T_{14}	0.24	0.43	0.33	0.04	0.02	0.03	0.13	0.08	0.11	0.11	0.01	0.06
S.Em.±	0.02	0.03	0.04	0.01	0.06	0.03	0.02	0.06	0.03	0.03	0.06	0.04
C.D at@ 5 %	NS	0.1	NS	0.01	NS	NS	NS	NS	NS	NS	NS	NS
S.Em.±												
YXT S.Em.±	—	—	0.03	—	—	0.04	—	—	0.04	—	—	0.05
C.D at @ 5 %	—	—	NS	—	—	NS	—	—	NS	—	—	NS
C.V @%	11.66	12.87	9.98	11.5	12.02	11.67	9.45	11.03	9.49	10.4	13.71	11.18

Table 6: Effect of phosphorus management on total Potassium (K) Calcium (Ca), Magnesium (Mg), and Sodium (Na) in (%) maize silk 2015-16, 2016-17 and Pooled

Treatment	Potassium (K)		Pooled	Calcium (Ca)		Pooled	Magnesium (Mg)		Pooled	Sodium (Na)		Pooled
	2015-16	**2016-17**		**2015-16**	**2016-17**		**2015-16**	**2016-17**		**2015-16**	**2016-17**	
T_1	0	0	0	0	0	0	0	0	0	0	0	0
T_2	0.86	1.5	1.18	0.2	0.61	0.41	0.15	0.15	0.15	0.07	0.3	0.19
T_3	1.2	1.58	1.39	0.39	0.62	0.5	0.23	0.16	0.2	0.1	0.31	0.2
T_4	1.22	1.73	1.47	0.46	0.74	0.6	0.21	0.14	0.17	0.24	0.29	0.27
T_5	1.28	1.57	1.42	0.42	0.71	0.56	0.22	0.14	0.18	0.15	0.29	0.22
T_6	1.31	1.59	1.45	0.49	0.64	0.56	0.29	0.14	0.17	0.1	0.32	0.21
T_7	1.15	1.49	1.32	0.54	0.79	0.55	0.18	0.14	0.16	0.21	0.26	0.24
T_8	1.47	1.63	1.55	0.53	0.77	0.65	0.19	0.14	0.21	0.1	0.27	0.19
T_9	1.31	1.51	1.41	0.31	0.65	0.48	0.25	0.13	0.19	0.12	0.28	0.2
T_{10}	1.31	1.39	1.35	0.45	0.76	0.61	0.28	0.13	0.2	0.18	0.13	0.16
T_{11}	1.22	1.57	1.39	0.45	0.68	0.57	0.24	0.17	0.2	0.12	0.3	0.21
T_{12}	1.0	1.69	1.35	0.42	0.65	0.54	0.21	0.17	0.19	0.24	0.28	0.26
T_{13}	1.1	1.53	1.31	0.4	0.62	0.51	0.22	0.14	0.18	0.12	0.22	0.17
T_{14}	1.07	1.37	1.22	0.26	0.68	0.47	0.26	0.15	0.21	0.16	0.25	0.2
S.Em.±	0.18	0.11	0.1	0.08	0.05	0.05	0.04	0.02	0.02	0.06	0.04	0.04
C.D at@ 5 %	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
S.Em.±												
YXT S.Em.±	—	—	0.15	—	—	0.07	—	—	0.03	—	—	0.05
C.D at @ 5 %	—	—	NS	—	—	NS	—	—	NS	—	—	NS
C.V @%	5.5	12.8	10.7	10	11.5	11.8	10	10.5	7.3	6.8	6.9	11.5

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