WELLCOME

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Title:

Influence of Foliar Application of Potassium and Mepiquat Chloride on Yield, Quality and Uptake of Micronutrient of Cotton

Objectives:

1. to evaluate the effects of foliar K and MC application on yield and fiber quality of cotton.
2. to investigate the uptake status of micronutrient in cotton leaf.
3. to identify the best combination of production treatments to improve yield.

Treatments:

Factor: A (potassium)	Factor: B (MC)
K_1= 0%,	H_1= 0
K_2= 0.75%,	H_2= 5,
K_3= 1.50% and	H_3= 10,
K_4= 2.25%	H_4= 15,
	H_5= 20 and
	H_6= 25 g ha^{-1}

Design : RCBD
Replications: 3

Figure 1: Effect of hormone on plant height

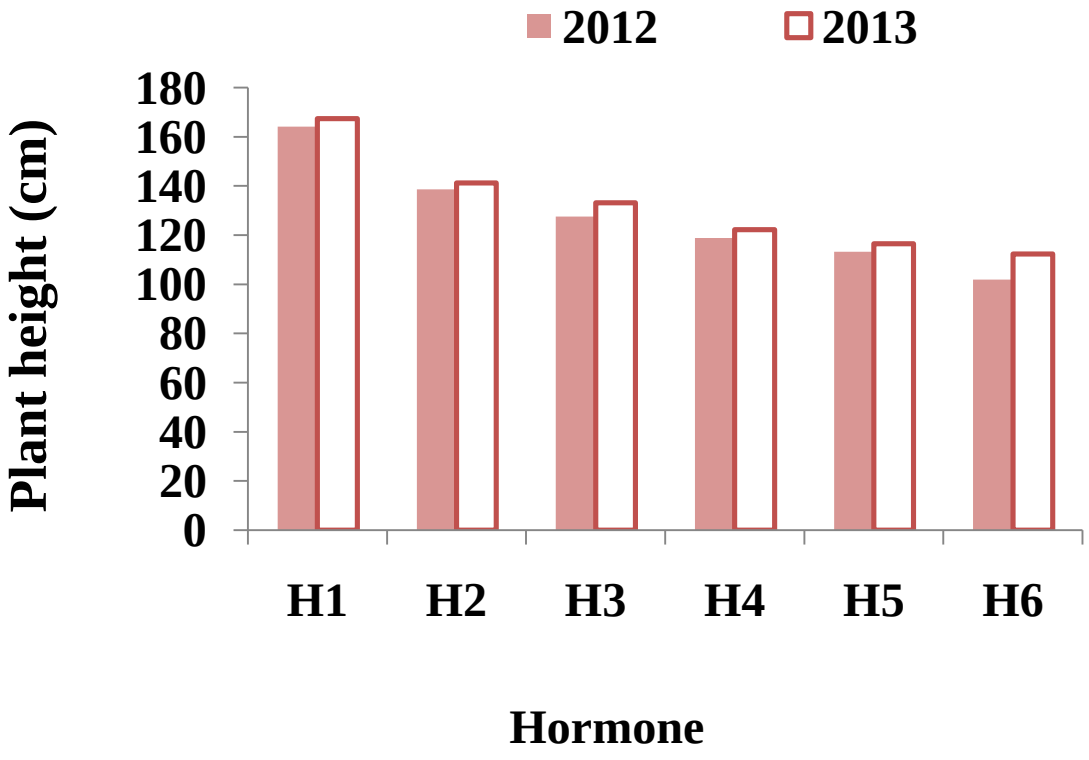

Figure 2: Effect of potassium on boll opening

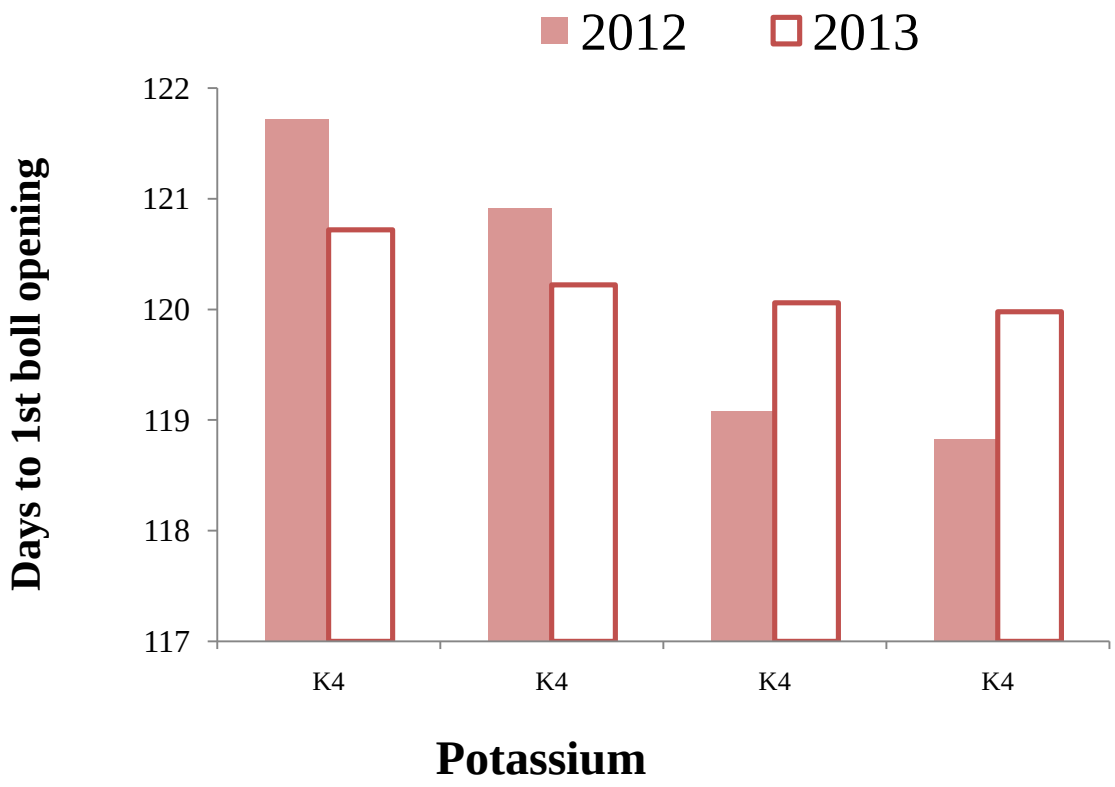

Figure 3: Effect of hormone on boll opening

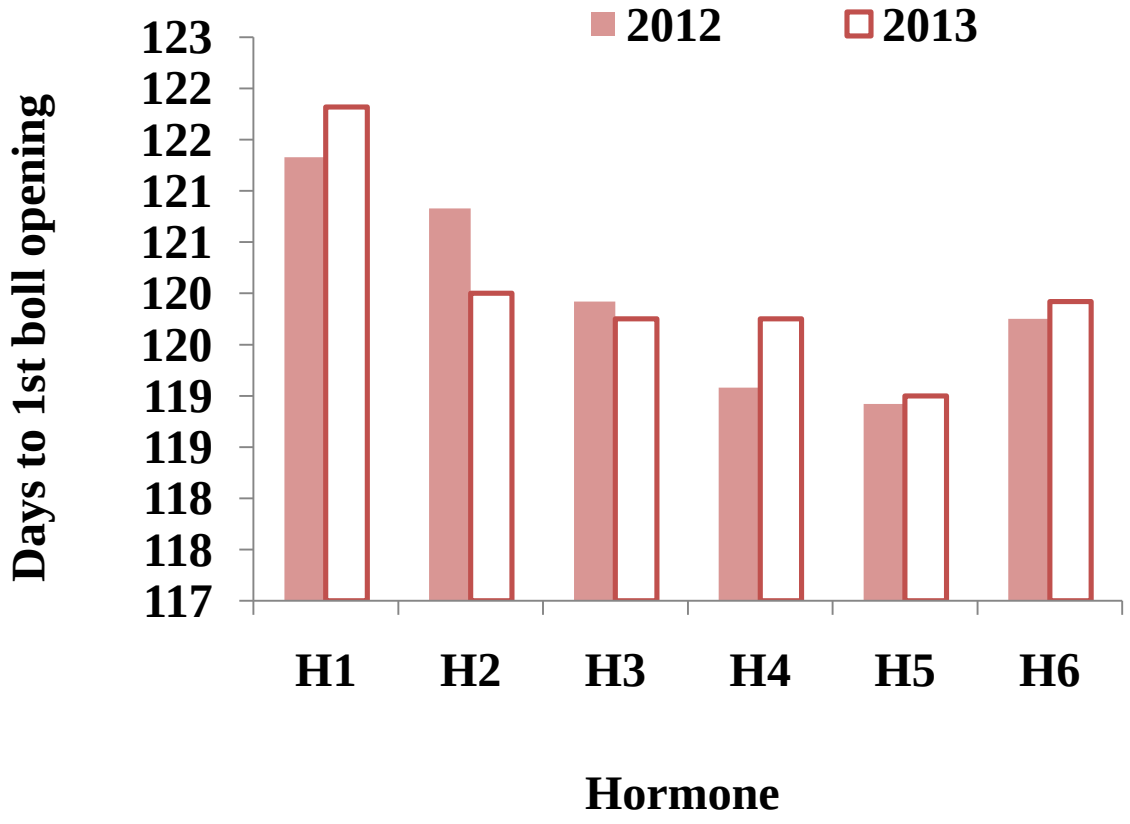

Figure 4: Effect of potassium on open bolls

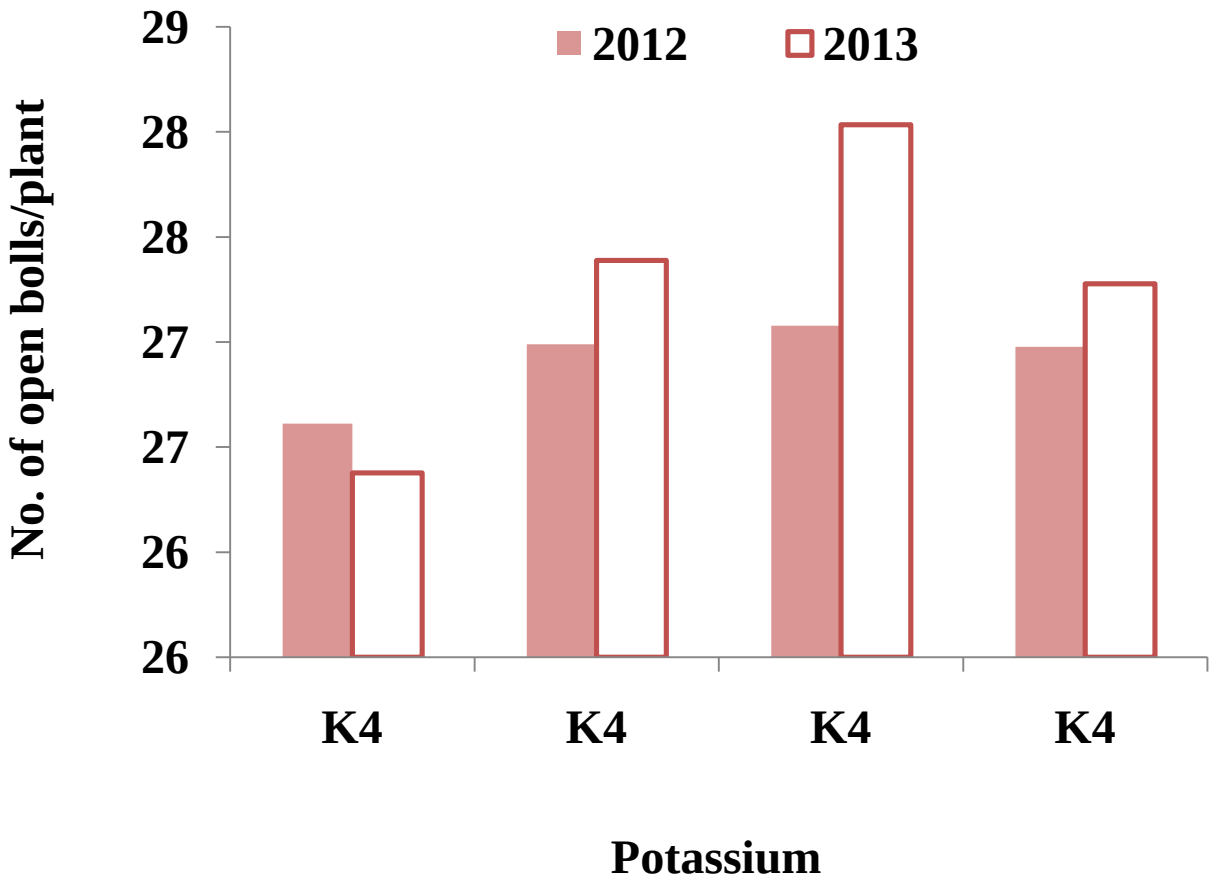

Figure 5: Effect of hormone on open bolls

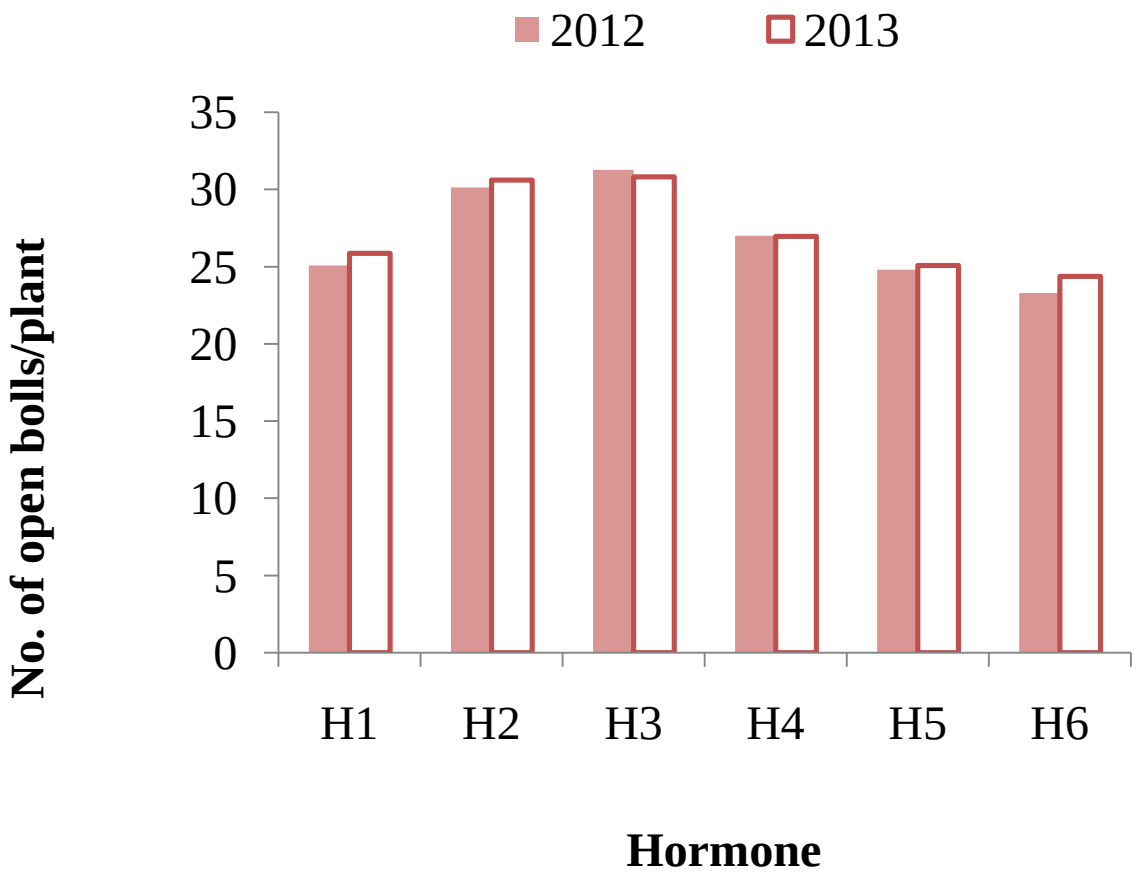

Figure 6: Effect of potassium on boll weight

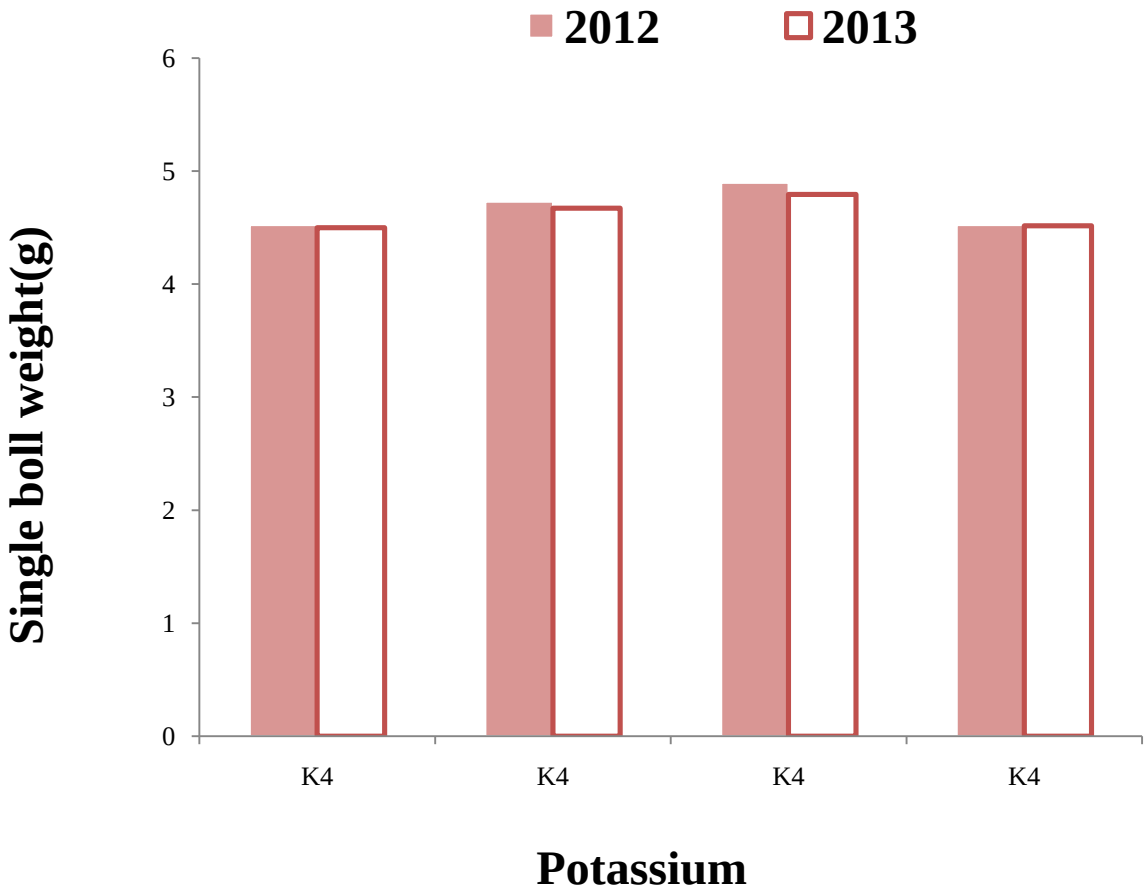

Figure 7: Effect of hormone on boll weight

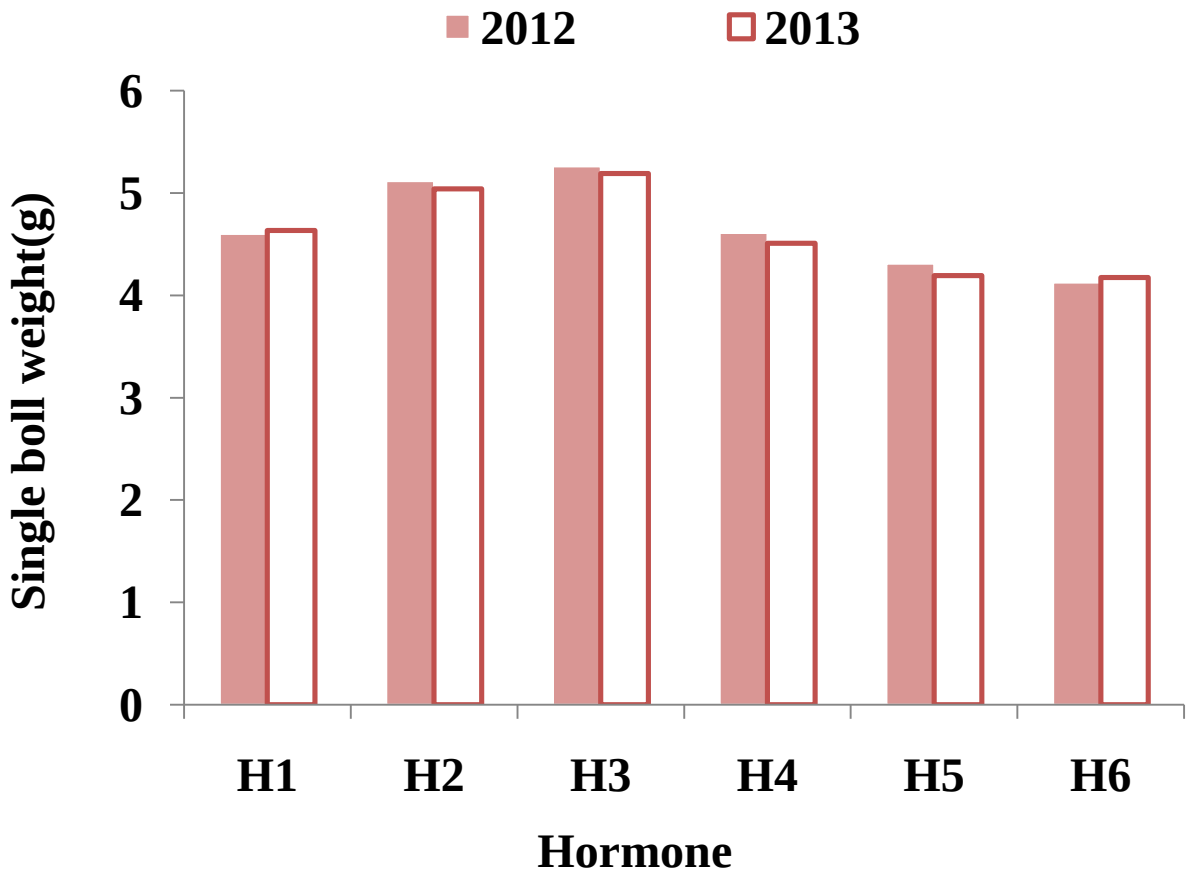

Figure 8: Effect of potassium on yield/ha

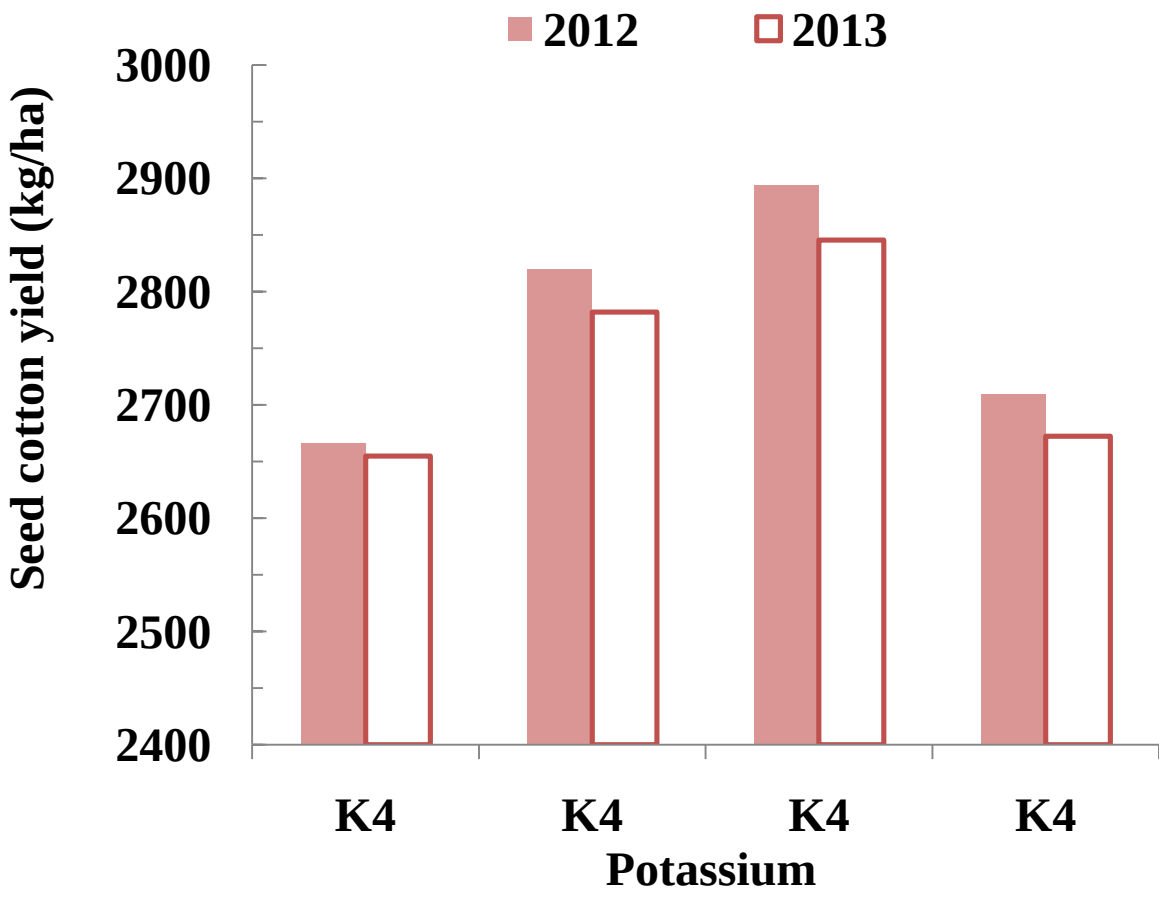

Figure 9: Effect of hormone on yield/ha

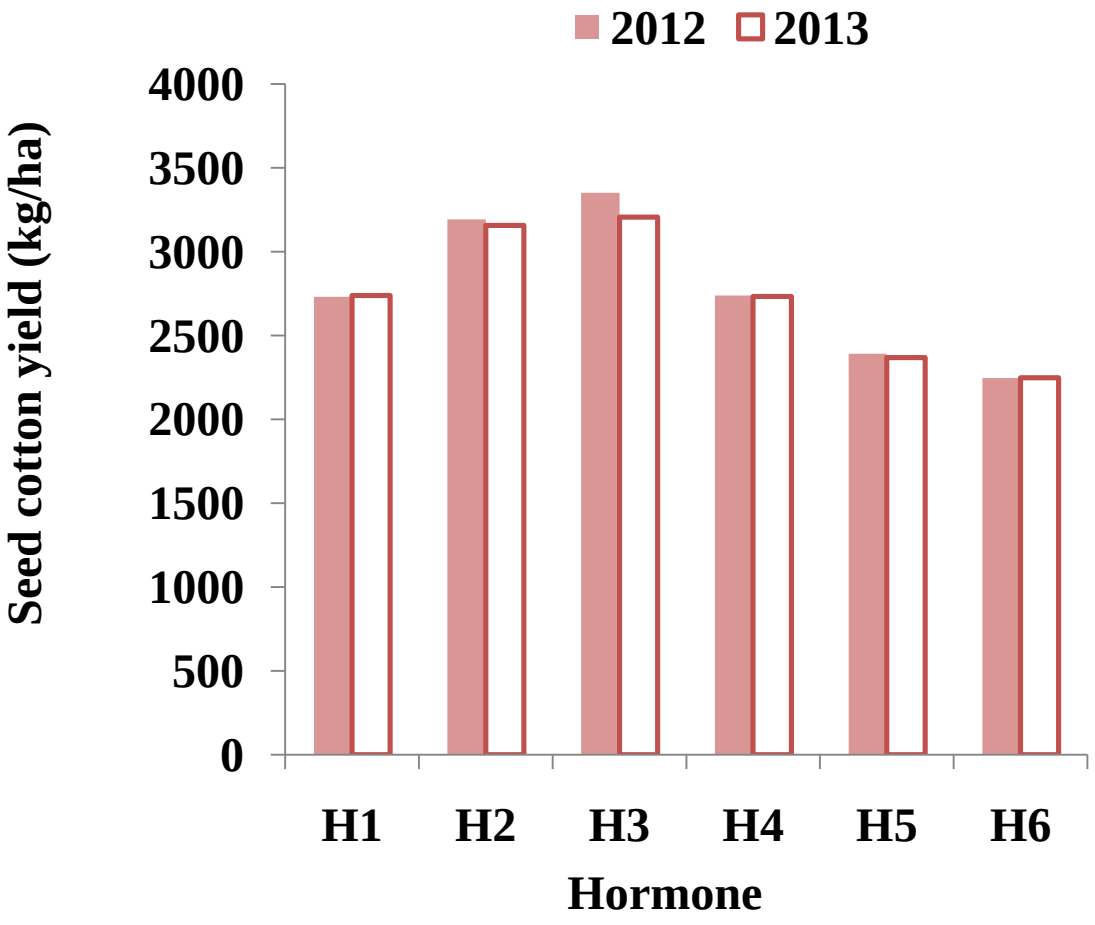

Table 1: Initial soil analysis of experimental field

Year	p^H	OM (%)	N (%)	K (meq/ 100g soil)	P µg/g soil	S µg/g soil	Mg (meq/ 100g soil)	Zn µg/g soil	B µg/g soil
2012	7.43	1.03	0.05	0.17	5.90	12.69	0.71	1.33	0.59
2013	7.43	1.03	0.05	0.17	5.97	12.60	0.71	1.32	0.56

Air temperature and rain fall data of 2012 and 2013 crop growing season, at Jessore

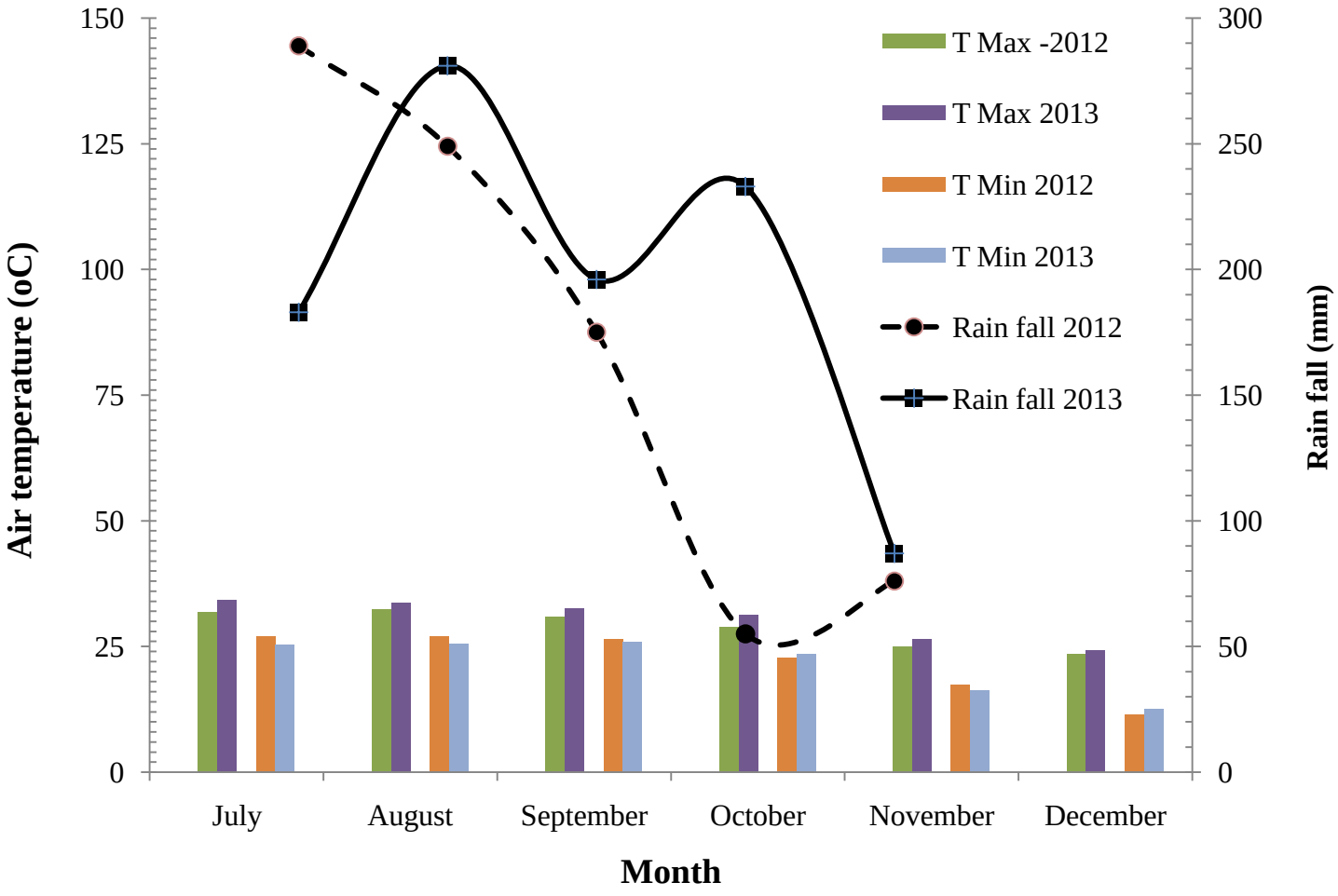

Table 3: Effect of foliar potassium and Mc on yield and yield component of cotton

Treatments	2012			2013		
	No. of open bolls/plant	Single boll weight(g)	Seed cotton yield(kg/ha)	No. of open bolls/plant	Single boll weight (g)	Seed cotton yield(kg/ha)
K1H1	25.53	4.40	2689.00	23.87	4.47	2633.67
K1H2	30.33	4.93	3061.33	30.53	4.93	3003.00
K1H3	31.67	5.13	3320.00	31.40	5.03	3186.67
K1H4	25.33	4.30	2431.33	25.27	4.27	2544.3
K1H5	24.27	4.27	2276.33	23.60	4.17	2350.33
K1H6	22.53	4.10	2217.33	23.60	4.13	2210.67
K2H1	24.93	4.67	2737.67	25.40	4.60	2702.33
K2H2	30.47	5.17	3242.33	30.73	5.07	3266.00
K2H3	31.93	5.33	3412.33	31.13	5.27	3245.67
K2H4	27.00	4.83	2803.33	27.27	4.77	2848.00
K2H5	24.40	4.23	2413.00	25.53	4.17	2351.67
K2H6	23.20	4.13	2309.00	24.27	4.17	2278.67
K3H1	24.93	4.83	2769.67	27.67	5.00	2906.33
K3H2	30.33	5.43	3332.67	30.87	5.23	3224.33
K3H3	31.40	5.47	3467.33	31.00	5.40	3284.00
K3H4	26.53	4.93	3090.00	27.33	4.73	2963.33
K3H5	25.40	4.47	2466.67	26.40	4.17	2423.33
K3H6	23.87	4.23	2238.33	24.93	4.23	2271.67
K4H1	24.87	4.50	2727.67	26.53	4.47	2713.00
K4H2	29.07	4.87	3060.00	30.00	4.87	3060.00
K4H3	30.07	5.10	3202.67	29.73	5.07	3106.00
K4H4	29.13	4.37	2632.33	28.00	4.27	2573.67
K4H5	25.13	4.27	2411.33	24.73	4.27	2350.33
K4H6	23.60	4.03	2223.67	24.67	4.17	2230.33
CV (%)	6.45	3.54	5.88	4.12	4.58	5.20
Level of sig.	**	**	**	**	**	*
LSD	1.92	0.18	172.5	1.35	0.12	172.5

Table 4: Effect of foliar potassium and MC on fiber quality of cotton and concentration of Zn and B in cotton leaf

Treatment	2012				2013			
	Micronaire	UHML (mm)	Zn (µg g-1[1])	Boron (µg g-[1])	Micronaire	UHML (mm)	Zn (µg g-[1])	Boron (µg g-[1])
K1H1	3.53	29.07	6.93	12.06	3.63	29.52	5.49	11.95
K1H2	3.54	29.41	7.06	12.50	3.54	29.50	5.70	11.42
K1H3	3.53	29.58	7.37	13.02	3.54	29.52	7.55	12.95
K1H4	3.55	29.33	7.76	13.33	3.59	29.59	8.29	13.53
K1H5	3.67	30.01	8.13	13.69	3.68	29.71	9.07	13.75
K1H6	3.63	29.82	8.78	14.12	3.64	29.63	10.80	14.83
K2H1	3.55	29.11	7.88	12.52	3.55	29.54	6.61	11.61
K2H2	3.57	29.94	8.37	12.69	3.60	29.79	6.96	12.03
K2H3	3.61	30.28	8.67	13.20	3.64	29.96	8.06	13.20
K2H4	3.73	30.57	9.53	13.83	3.70	30.01	9.01	13.69
K2H5	3.85	30.19	9.69	14.22	3.97	30.04	10.36	15.11
K2H6	3.95	30.78	10.94	14.81	4.00	30.11	11.41	16.02
K3H1	3.64	29.70	11.82	12.36	3.73	29.76	7.61	12.03
K3H2	3.80	29.31	11.98	12.85	3.80	29.83	9.24	12.49
K3H3	3.96	29.38	12.54	13.14	3.86	29.87	9.91	13.12
K3H4	4.02	29.65	12.83	14.10	3.81	29.87	11.60	14.44
K3H5	4.14	30.49	13.30	14.29	3.89	29.98	12.34	15.04
K3H6	4.18	30.42	13.30	14.43	4.02	30.00	13.23	15.72
K4H1	3.75	29.59	12.32	12.24	3.79	29.59	9.64	13.25
K4H2	3.82	29.68	12.47	12.85	3.82	29.62	12.07	13.42
K4H3	3.87	29.72	12.78	13.37	3.87	29.74	13.98	14.18
K4H4	4.13	30.06	13.08	14.13	4.07	29.91	16.62	14.93
K4H5	4.26	30.17	13.52	14.32	4.02	29.92	17.69	15.50
K4H6	4.22	30.80	14.01	14.62	4.16	29.99	21.47	16.48
CV (%)	3.65	1.98	2.78	5.21	5.20	4.63	5.88	4.75
Level of sig.	*	**	NS	NS	**	*	**	NS
LSD	0.17	0.19			0.10	0.16	1.38	

Table 5. Correlation matrix for cotton yield and different parameter in 2012 and 2013

Year 2012					
Parameters	**Yield**	**D. flowering**	**D. ball opening**	**B.weight**	**Height**
Days to flowering	-.114				
Days to ball opening	-.448**	.000			
Boll weight	.953**	-.078	-.437**		
Height	.448**	-.135	-.023	.408**	
No. of open bolls	.874**	-.116	-.482**	.804**	.234*

Year 2013					
Parameters	**Yield**	**D. flowering**	**D. ball opening**	**B.weight**	**Height**
Days to flowering	.079				
Days to ball opening	-.527**	.161			
Boll weight	.945**	.153	-.473**		
Height	.466**	-.142	-.395**	.461**	
No. of open bolls	.892**	.181	-.477**	.860**	.284*

Conclusions:

In the present study, the highest yield was obtained from the combination of 1.5% K and 10 gha^{-1} MC (98% a.i.) foliar application. Yield was increased (average 8%) with two application of foliar K (1.5%) at 60 and 90 DAP. Foliar application of MC at 40 and 70 DAS @ 10 g ha^{-1} produced approximately 20% more yield than control. Fiber quality showed better with the increase use of foliar potassium and mepiquat chloride. The finding infers that yield was increased due to might have increased of boll numbers and boll weight which resulted from the effect of foliar K and MC application. Further research deserves for the application of micronutrient with combination of foliar application of K and MC that might have positive impact on yield enhancement and quality improvement of cotton.

64
K1H1

57
K1H2

50
K1H3

61
K1H5

68
K2 H3

62
K2H4

71
K2H5

52
K3 H3
29/11/2012

58
K4H2

54
K4H3

63
K4H5

THANKS