

TERMINAL REPORT

Efficacy Evaluation of Metalosate Multiminerals[™] as Liquid Foliar Fertilizer for Corn

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Efficacy Evaluation of Metalosate Multimineral™ as Liquid Foliar Fertilizer for Corn

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ABSTRACT

The efficacy evaluation was conducted at the Research Experimental Station, RET-CLSU, Science City of Muñoz, Nueva Ecija from February 2015 to May 2015 to evaluate the efficacy of Metalosate Multimineral™ Liquid Foliar Fertilizer on corn.

Metalosate Multimineral™ liquid foliar fertilizer applied as follow up spray at the rates of 0.50 and 0.75 liters per hectare applied at 35 Days After Emergence (DAE) with recommended rate of inorganic fertilizer (RRIF) applied during planting at the recommended rate of 150-60-90 kg N-P₂O₅-K₂O produced the tallest plants (at 60 DAP and at harvest), highest number of ears, heaviest weight of fresh ears and highest dry weight of kernels.

The optimum recommended rate for Metalosate Multimineral™ as follow up spray at 35 DAE to recommended rate of inorganic fertilizer is 0.5 to 0.75 liters product per hectare.

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Introduction

Crop growth and development are dependent on several factors; soil, water supply and biotic and abiotic stress among others. Thus, growers have to address and follow various requirements to achieve optimum growth and yield on their crops. In addition, the market and the consumers are setting quality standard for the produce, not only to look good, but also needs to be firm to the touch, crunchy and full of nutrition. Essentially, crop produce needs to last longer and arrive in better condition in the market thus, the need for the plants for optimum mineral nutrition to be healthy.

Metalosate Liquid Foliar Fertilizers from Albion Plant Nutrition are designed for foliar application on plants to prevent or correct nutrient deficiencies that may limit crop growth and yields. Albion's unique patented manufacturing process and formulations ensures that plants will get the most readily absorbable, highest quality nutrition available.

Albion's Metalosate lines use amino acids in their chelation technology. Chelation is the process of attaching a specific organic molecule to a mineral in two or more places to form a ring. The molecule holds the mineral like a claw to make it stable and readily absorbable. Since amino acids are the basic building blocks of protein found in all living organisms, the chelation of minerals with amino acids provides a tremendous advantage in the efficiency of absorption and translocation of minerals within plants.

There are other types of chelation, especially the synthetic types like EDTA and EDDHA. The advantage of using natural chelated forms of minerals is that the amino acid ligands surround and protect the minerals from adverse interactions which take place in a solution, in the soil or on the surface of the leaf. They often render the minerals unavailable to the plant. Because Albion uses natural amino acids to chelate the minerals, they are rapidly absorbed, translocated and metabolized by plants.

Metalosate Multimineral™ Liquid Foliar Fertilizer contains well balanced nutrients specifically designed to support fruit development. The product contains 1.0 % Ca, 0.5% Cu, 0.5% Fe, 1% Mg, 0.5% Mn, 0.1% Mo, and 0.5% Zn. Throughout the years, it has been proven that foliar mineral application in addition to major nutrient fertilization increase

crop yield and is well noted on fruiting vegetables. These essential nutrients, contrary to the major nutrients – NPK, are required in minute amounts but functions as equally important on total crop growth and development.

JOCANIMA Corporation, a leading Filipino owned agrochemical Corporation in collaboration with Albion Plant Nutrition from Utah, USA, will introduce Metalosate Multimineral™ liquid foliar fertilizer and its novel technology to the Filipino farmers. This will help farmers meet the soaring standards for crop production by improving crop growth, development and yield.

Objectives

- 1) Evaluate the efficacy of Metalosate Multimineral™ Liquid Foliar Fertilizer on corn;
- 2) Evaluate the effect of different rates of application of Metalosate Multimineral™ Liquid Foliar Fertilizer in combination with commercial fertilizers used; and
- 3) Generate the bioefficacy data to support the registration of MetalosateMultimineral™ Liquid Foliar Fertilizer Supplement with Fertilizer and Pesticide Authority (FPA)

Methodology

- 1) Time and place of test

The study was conducted from February 2015 to May 2015 in Research Experimental Station, RET-CLSU, Science City of Munoz, Nueva Ecija. Prior to land preparation soil sample was collected and brought in the laboratory for the analysis of pH, N, P₂O₅ and K₂O contents using Soil Test Kit (STK) as basis for the recommended rate of inorganic fertilizer treatment.

2) Treatments

The following standard treatments as per FPA Guidelines for Foliar Applied Liquid Fertilizer (Micronutrients) were used.

T1 – Control (no fertilizer)

T2 – Recommended Rate of Inorganic Fertilizer (RRIF)

T3 – RRIF + ½ Recommended Rate of Metalosate Multimineral™ (RRMM)

T4 – RRIF + RRMM

T5 – RRIF + 1½ RRMM

T6 – RRMM

An area of 500 sq m with plots measuring 4 meters x 5 meters was prepared. The treatments were laid-out following the Randomized Complete Block Design with 3 replications. Data were analyzed using the analysis of variance (ANOVA) technique. Treatment means were compared using the Duncan's Multiple Range Test (DMRT).

3) Fertilizers

a. Reference fertilizers or inorganic fertilizers

The recommended nutrient requirement for corn was applied based on actual field practice. As a result of soil analysis using STK, the recommended rate of using inorganic fertilizer applied at planting was 150-60-90 kg NP₂O₅K₂O.

b. Metalosate Multimineral™ was applied at the recommended rate of 0.5 L/ha. The only application was at V10 (35 DAE).

4) Cultural Practices

The recommended cultural practices including pest and disease control and irrigation were followed.

5) Data gathered

Number of ears per plot at harvest
 Weight of fresh ears with husks per plot at harvest
 Weight of fresh ears without husks per plot at harvest
 Dry weight of kernel in tons/ha at harvest
 Plant height at 60 DAP and at harvest
 Soil analysis
 Plant biomass
 Nutrient deficiency symptoms, if any
 Phytotoxicity, if any
 Weather conditions
 Pest and disease incidence

6. Experimental Lay-out

T₃	T₁	T₄
T₅	T₄	T₆
T₂	T₃	T₁
T₆	T₅	T₃
T₁	T₂	T₅
T₄	T₆	T₂
Rep1	Rep 2	Rep 3

Results and Discussion

The growth and yield characteristics of corn as affected by the application of Metalosate Multimineral™ applied alone and/or as follow up spray to inorganic fertilizer are presented in Tables 1 to 5

Number of ears per plot (20 sq m)

Number of ears per plot at harvest was significantly affected by fertilizer treatments. Analysis of variance showed that the application of inorganic fertilizer with follow up spray of Metalosate Multimineral™ on number of ears harvested per plot were statistically significant. Application of 1 ½ recommended rate of Metalosate Multimineral™ Liquid Foliar Fertilizer (0.75 L/ha) applied at 35 DAE as follow up spray treatment to the basal application of recommended rate of inorganic fertilizer (150-60-90 kg) NP₂O₅K₂O (Treatment 5) produced the highest number of ears per plot. This treatment provided 43.38% increase in yield compared with the yield obtained from treatment plots that received only the recommended rate of inorganic fertilizer (Treatment 2).

Corn plants that received the recommended rate of Metalosate Multimineral™ Liquid Foliar Fertilizer applied at the rate of 0.5 L/ha as follow up spray to the basal application of the recommended rate of inorganic fertilizer (Treatment 4) provided 43.01% yield increase compared with yield obtained from plants grown on plots that received only the recommended rate of inorganic fertilizer (Treatment 2). The results implies that spraying of Metalosate Multimineral™ at the rates of 0.5 L to 0.75 L/ha as follow up spray to recommended rate of inorganic fertilizer complement each other to satisfy the nutrient requirements of the crop. In addition, the effect of Metalosate Multimineral™ Liquid Foliar Fertilizer applied alone at the recommended rate of 0.5 L/ha (Treatment 6) provided 10.93 % yield increase compared with yield obtained from plants grown on plots that received only the recommended rate of inorganic fertilizer (Treatment 2).

Table 1. Number of ears per plot at harvest area as affected by the different treatments

Treatment	Rate of Application kg NP ₂ O ₅ K ₂ O/ha L/ha	Time of Application	Number of Ears per Plot at Harvest (20 sq m)
T1- Control (no fertilizer)	-	-	68.3 ^d
T2- Recommended Rate of Inorganic Fertilizer (RRIF)	150-60-90	At planting	82.3 ^c
T3- RRIF + ½ Recommended Rate of Metalosate Multimineral™ (RRMM)	150-60-90 0.25	At planting 35 DAE	98.3 ^b
T4- RRIF + RRMM	150-60-90 0.5	At planting 35 DAE	117.7 ^a
T5- RRIF + 1 ½ RRMM	150-60-90 0.75	At planting 35 DAE	118.0 ^a
T6- RRMM	0.5	35 DAE	91.3 ^b

Means followed by a common letter are not significantly different at the 5 % level by DMRT.

Weight (kg) of fresh ears with and without husks

Weights of fresh ears of corn with and without husks are presented in Table 2. Application of 1 ½ Recommended rate of Metalosate Multimineral™ (0.75 L/ha) as follow up spray to the recommended rate of inorganic fertilizer (Treatment 5) produced plants with the highest weight of fresh ears. However, no significant differences were observed from plots that received the spray application of recommended rate of Metalosate Multimineral™ (0.5 L/ha) as follow up spray to the recommended rate of inorganic fertilizer (Treatment 4). The plants from these treatments produced the highest weight of fresh ears with and without husks with yield increase of 36.64% and 26.71 % with husks and 38.67% and 28 % without husks, respectively compared to plants that received only the recommended rate of inorganic fertilizer (Treatment 2). Moreover, results from the application recommended rate of inorganic fertilizer alone (Treatment 2), application of reduced rate of Metalosate Multimineral™ as follow up spray with the recommended rate of inorganic fertilizer (Treatment 3) and application at only the recommended rate of Metalosate Multimineral™ are all statistically similar.

Table 2. Weight (kg) of fresh ears with and without husks per plot at harvest as affected by the different treatments

Treatment	Rate of Application kg NP ₂ O ₅ K ₂ O/ha L/ha	Time of Application	Weight of Fresh Ears per Plot	
			With husks	Without husks
T1- Control (no fertilizer)	-	-	9.5 ^c	8.7 ^c
T2- Recommended Rate of Inorganic Fertilizer (RRIF)	150-60-90	At planting	16.1 ^b	15.0 ^b
T3- RRIF + ½ Recommended Rate of Metalosate Multiminerals™ (RRMM)	150-60-90 0.25	At planting 35 DAE	17.2 ^b	16.0 ^b
T4- RRIF + RRMM	150-60-90 0.5	At planting 35 DAE	20.4 ^a	19.2 ^a
T5- RRIF + 1 ½ RRMM	150-60-90 0.75	At planting 35 DAE	22.0 ^a	20.8 ^a
T6- RRMM	0.5	35 DAE	15.1 ^b	14.1 ^b

Means followed by a common letter are not significantly different at the 5 % level by DMRT.

Dry weight of kernel

The application of Metalosate Multiminerals™ 1 ½ recommended rate, 0.75 Liters and recommended rate of 0.5 Liters per hectare as follow up spray to the recommended rate of inorganic fertilizer significantly affected the kernel dry weight yield. These treatment plots produced the highest dry weight of kernel with 7.8 and 7.6 tons/ha, respectively. Lowest dry weight of kernel was recorded from the control plants with mean value of 3.1 tons/ha (Table 3).

Table 3. Dry weight of kernel in tons per hectare as affected by the different treatments

Treatment	Rate of Application kg NP ₂ O ₅ K ₂ O/ha L/ha	Time of Application	Dry Weight of Kernel (tons/ha)
T1- Control (no fertilizer)	-	-	3.1 ^d
T2- Recommended Rate of Inorganic Fertilizer (RRIF)	150-60-90	At planting	6.0 ^{bc}
T3- RRIF + ½ Recommended Rate of Metalosate Multiminerals™ (RRMM)	150-60-90 0.25	At planting 35 DAE	6.4 ^b
T4- RRIF + RRMM	150-60-90 0.5	At planting 35 DAE	7.6 ^a
T5- RRIF + 1 ½ RRMM	150-60-90 0.75	At planting 35 DAE	7.8 ^a
T6- RRMM	0.5	35 DAE	5.6 ^c

Means followed by a common letter are not significantly different at the 5 % level by DMRT.

Plant Biomass

Ten (10) randomly selected sample plants were collected at harvest to assess the plant biomass (in kilogram). Plants applied with varying rates of Metalosate Multiminerals™ (0.75, 0.50 and 0.25 L/ha) as follow up spray to the recommended rate of inorganic fertilizer obtained the highest production of plant biomass. Plants from these treatment plots produced the highest biomass of 4.39, 4.34 and 4.27 kg per ten plants, respectively and did not vary significantly from each other. The highest biomass (4.39 kg) was obtained from plants that received follow up spray application of 0.75 L/ha that was significantly higher to the biomass obtained from plants that received only the recommended rate of inorganic commercial fertilizer. The lowest plant biomass was (2.60 kg) was obtained from plants grown in the untreated control plots (Table 4).

Table 4. Plant biomass based on 10 randomly selected sample plants at harvest as affected by the different treatments

Treatment	Rate of Application kg NP ₂ O ₅ K ₂ O/ha L/ha	Time of Application	Plant Biomass (kg)
T1- Control (no fertilizer)	-	-	2.60 ^d
T2- Recommended Rate of Inorganic Fertilizer (RRIF)	150-60-90	At planting	4.11 ^b
T3- RRIF + ½ Recommended Rate of Metalosate Multiminerals™ (RRMM)	150-60-90 0.25	At planting 35 DAE	4.27 ^a
T4- RRIF + RRMM	150-60-90 0.5	At planting 35 DAE	4.34 ^a
T5- RRIF + 1 ½ RRMM	150-60-90 0.75	At planting 35 DAE	4.39 ^a
T6- RRMM	0.5	35 DAE	3.82 ^c

Means followed by a common letter are not significantly different at the 5 % level by DMRT.

Plant height at 60 DAP and at harvest

Tallest plants at 60 DAP and at harvest (215.40 cm and 220.90, respectively) were recorded from corn plants that received 1 ½ recommended rate (0.75L/ha) of Metalosate Multiminerals™ as follow up spray to the recommended basal application of inorganic fertilizer. However, these results did not vary significantly on plant height of treatment plots that received 0.5 and 0.25 L/ha of Metalosate Multiminerals™ as follow up spray to the recommended basal application of inorganic fertilizer. These treatments produced significantly taller plants compared with the plants that received only the recommended rate of inorganic fertilizer. The shortest plants were recorded from the untreated control plots at 60 DAP and at harvest, with 127.4 cm and 158.5 cm, respectively, which is statistically the lowest among treatments.

Table 5. Plant heights (cm) at 60 DAP and at harvest based on 10 randomly selected sample plants as affected by the different treatments

Treatment	Rate of Application kg NP ₂ O ₅ K ₂ O/ha L/ha	Time of Application	Plant Heights (cm)	
			60 DAP	At Harvest
T1- Control (no fertilizer)	-	-	127.4 ^d	158.5 ^c
T2- Recommended Rate of Inorganic Fertilizer (RRIF)	150-60-90	At planting	196.0 ^b	205.9 ^a
T3- RRIF + ½ Recommended Rate of Metalosate Multimineral™ (RRMM)	150-60-90 0.25	At planting 35 DAE	201.0 ^{ab}	210.2 ^a
T4- RRIF + RRMM	150-60-90 0.5	At planting 35 DAE	209.2 ^{ab}	215.4 ^a
T5- RRIF + 1 ½ RRMM	150-60-90 0.75	At planting 35 DAE	215.4 ^a	220.9 ^a
T6- RRMM	0.5	35 DAE	177.4 ^c	190.5 ^b

Means followed by a common letter are not significantly different at the 5 % level by DMRT.

Summary and Conclusion

Metalosate MultiminerallTM applied at the rate of 0.75 and 0.5L/ha as follow up spray to the recommended rate of inorganic fertilizer (150-60-90 kgN-P₂O₅-K₂O) significantly produced taller plants with heavier biomass and higher yield compared to those that received only the recommended rate of inorganic fertilizer. Follow up spray of 0.25 L/ha Metalosate MultiminerallTM to the recommended rate of inorganic fertilizer significantly produced heavier biomass compared to those that received only the recommended rate of inorganic fertilizer. Limited benefits in terms of plant height, biomass and yield were recorded when Metalosate MultiminerallTM is applied singly without basal application of inorganic fertilizer.

Based on gathered parameters, follow up spray application of 0.5 to 0.75 L/ha Metalosate MultiminerallTM Foliar Fertilizer to the recommended rate of inorganic fertilizer showed synergistic effect in supporting the nutritional needs of corn plants. Therefore, the optimum application rates of Metalosate MultiminerallTM is 0.5 to 0.75 L/ha applied as follow up spray at 35 DAE to the recommended rate of inorganic fertilizer.

Based on the results of this study, it is highly recommended to grant registration approval to Metalosate MultiminerallTM as liquid foliar fertilizer for corn production.

APPENDIX TABLES

Appendix Table 1a. Number of ears per plot at harvest as affected by different fertilizer treatments

Treatments	REPLICATION			TOTAL	MEAN
	I	II	III		
T1- Control (no fertilizer)	70.0	65.0	70.0	205.0	68.3 ^d
T2- Recommended Rate of Inorganic Fertilizer (RRIF)	85.0	80.0	82.0	247.0	82.3 ^c
T3- RRIF + ½ Recommended Rate of Metalosate Multimineral (RRMM)	93.0	97.0	105.0	295.0	98.3 ^b
T4- RRIF + RRMM	115.0	120.0	118.0	353.0	117.7 ^a
T5- RRIF + 1 ½ RRMM	121.0	117.0	116.0	354.0	118.0 ^a
T6- RRMM	86.0	93.0	95.0	274.0	91.3 ^b

Appendix Table 1b. Analysis of variance on number of ears per plot at harvest as affected by different fertilizer treatments

Source of variance	df	SS	MS	F value	F tabular	
					.05	.01
Replication	2	25.3333	12.6667	0.84	4.10	7.56
Treatment	5	5798.6667	1159.7333	77.32**	3.33	5.64
Error	10	150.0000	15.0000			
Total	17	5974.0000	351.4118			

**= highly significant

cv = 4.03%

Appendix Table 2.1a. Weight (kg) of fresh ears with husks per plot at harvest as affected by different fertilizer treatments

Treatments	REPLICATION			TOTAL	MEAN
	I	II	III		
T1- Control (no fertilizer)	9.4	8.9	10.2	28.5	9.5 ^c
T2- Recommended Rate of Inorganic Fertilizer (RRIF)	15.3	16.3	16.6	48.2	16.1 ^b
T3- RRIF + ½ Recommended Rate of Metalosate Multimineral (RRMM)	16.3	17.1	18.2	51.6	17.2 ^b
T4- RRIF + RRMM	19.7	20.1	21.5	61.3	20.4 ^a
T5- RRIF + 1 ½ RRMM	22.7	24.2	19.2	66.1	22.0 ^a
T6- RRMM	14.7	14.2	16.4	45.3	15.1 ^b

Appendix Table 2.1b. Analysis of variance on weight (kg) of fresh ears with husks per plot at harvest as affected by different fertilizer treatments

Source of variance	Df	SS	MS	F value	F tabular	
					.05	.01
Replication	2	1.3878	0.6939	0.35	4.10	7.56
Treatment	5	292.2912	58.4582	29.48**	3.33	5.64
Error	10	19.8322	1.9832			
Total	17	313.5112	18.4418			

**= highly significant

cv = 8.42%

Appendix Table 2.2a. Weight (kg) of fresh ears without husks per plot at harvest as affected by different fertilizer treatments

Treatments	REPLICATION			TOTAL	MEAN
	I	II	III		
T1- Control (no fertilizer)	8.5	8.1	9.4	26.0	8.7 ^c
T2- Recommended Rate of Inorganic Fertilizer (RRIF)	14.3	15.2	15.6	45.1	15.0 ^b
T3- RRIF + ½ Recommended Rate of Metalosate Multimineral (RRMM)	15.1	15.9	17.0	48.0	16.0 ^b
T4- RRIF + RRMM	18.6	18.8	20.3	57.7	19.2 ^a
T5- RRIF + 1 ½ RRMM	21.5	22.8	18.2	62.5	20.8 ^a
T6- RRMM	13.8	13.3	15.2	42.3	14.1 ^b

Appendix Table 2.2b. Analysis of variance on weight (kg) of fresh ears without husks per plot at harvest as affected by different fertilizer treatments

Source of variance	df	SS	MS	F value	F tabular	
					.05	.01
Replication	2	1.2811	0.6406	0.37	4.10	7.56
Treatment	5	274.1378	54.8276	31.83**	3.33	5.64
Error	10	17.2255	1.7226			
Total	17	292.6444	17.2144			

**= highly significant

cv = 8.38%

Appendix Table 3a. Dry weight of kernel in tons per hectare as affected by different fertilizer treatments

Treatments	REPLICATION			TOTAL	MEAN
	I	II	III		
T1- Control (no fertilizer)	3.0	2.9	3.3	9.2	3.1 ^d
T2- Recommended Rate of Inorganic Fertilizer (RRCF)	5.7	6.1	6.3	18.1	6.0 ^{bc}
T3- RRIF + ½ Recommended Rate of Metalosate Multimineral (RRMM)	5.8	6.4	7.0	19.1	6.4 ^b
T4- RRIF + RRMM	7.3	7.4	8.1	22.8	7.6 ^a
T5- RRIF + 1 ½ RRMM	8.1	7.9	7.5	23.5	7.8 ^a
T6- RRMM	5.4	5.2	6.1	16.7	5.6 ^c

Appendix Table 3b. Analysis of variance on dry weight of kernel in tons per hectare as affected by different fertilizer treatments

Source of variance	df	SS	MS	F value	F tabular	
					.05	.01
Replication	2	0.8400	0.4200	3.60	4.10	7.56
Treatment	5	44.4983	8.8997	76.28**	3.33	5.64
Error	10	1.1667	0.1167			
Total	17	46.5050	2.7356			

**= highly significant

cv = 5.61%

Appendix Table 4a. Plant biomass (kg) based on 10 sample plants at harvest as affected by different fertilizer treatments

Treatments	REPLICATION			TOTAL	MEAN
	I	II	III		
T1- Control (no fertilizer)	2.63	2.44	2.72	7.79	2.60 ^d
T2- Recommended Rate of Inorganic Fertilizer (RRIF)	4.17	4.13	4.02	12.32	4.11 ^b
T3- RRIF + ½ Recommended Rate of Metalosate Crop-Up (RRMCU)	4.28	4.25	4.28	12.81	4.27 ^a
T4- RRIF + RRMCU	4.37	4.30	4.35	13.02	4.34 ^a
T5- RRIF + 1 ½ RRMCU	4.40	4.39	4.39	13.18	4.39 ^a
T6- RRMCU	3.80	3.75	3.92	11.47	3.82 ^c

Appendix Table 4b. Analysis of variance on plant biomass (kg) based on 10 sample plants at harvest as affected by different fertilizer treatments

Source of variance	df	SS	MS	F value	F tabular	
					.05	.01
Replication	2	0.0183	0.0091	1.72	4.10	7.56
Treatment	5	6.9550	1.3910	261.63**	3.33	5.64
Error	10	0.0532	0.0053			
Total	17	7.0264	0.4133			

**= highly significant

cv = 1.85%

Appendix Table 5.1a. Plant height (cm) at 60 DAP based on 10 sample plants as affected by different fertilizer treatments

Treatments	REPLICATION			TOTAL	MEAN
	I	II	III		
T1- Control (no fertilizer)	130.3	128.3	123.6	382.2	127.4 ^d
T2- Recommended Rate of Inorganic Fertilizer (RRIF)	192.9	185.1	210.0	588.0	196.0 ^b
T3- RRIF + ½ Recommended Rate of Metalosate Crop-Up (RRMCU)	203.4	202.7	196.8	603.0	201.0 ^{ab}
T4- RRIF + RRMCU	214.9	212.5	200.1	627.5	209.2 ^{ab}
T5- RRIF + 1 ½ RRMCU	212.6	213.2	220.4	646.3	215.4 ^a
T6- RRMCU	186.5	175.3	170.3	532.1	177.4 ^c

Appendix Table 5.1b. Analysis of variance on plant height (cm) at 60 DAP based on 10 sample plants as affected by different fertilizer treatments

Source of variance	df	SS	MS	F value	F tabular	
					.05	.01
Replication	2	52.9128	26.4564	0.43	4.10	7.56
Treatment	5	15658.9644	3131.7929	50.33**	3.33	5.64
Error	10	622.2811	62.2281			
Total	17	16334.1584	960.8328			

**= highly significant

cv = 4.20%

Appendix Table 5.2a. Plant height (cm) at harvest based on 10 sample plants as affected by different fertilizer treatments

Treatments	REPLICATION			TOTAL	MEAN
	I	II	III		
T1- Control (no fertilizer)	147.3	155.8	172.3	475.4	158.5 ^c
T2- Recommended Rate of Inorganic Fertilizer (RRIF)	199.5	200.2	218.1	617.8	205.9 ^a
T3- RRIF + ½ Recommended Rate of Metalosate Crop-Up (RRMCU)	214.3	210.8	205.6	630.7	210.2 ^a
T4- RRIF + RRMCU	219.5	216.4	210.4	646.3	215.4 ^a
T5- RRIF + 1 ½ RRMCU	218.7	219.4	224.6	662.7	220.9 ^a
T6- RRMCU	195.4	186.7	189.4	571.5	190.5 ^b

Appendix Table 5.2b. Analysis of variance on plant height (cm) at harvest based on 10 sample plants as affected by different fertilizer treatments

Source of variance	df	SS	MS	F value	F tabular	
					.05	.01
Replication	2	92.0479	46.0239	0.77	4.10	7.56
Treatment	5	7889.4971	1577.8994	26.52**	3.33	5.64
Error	10	594.9790	59.4979			
Total	17	8576.5240	504.5014			

**= highly significant

cv = 3.85%

PHOTO DOCUMENTATION 63 DAP



T1 - Control



T2 - RRIF



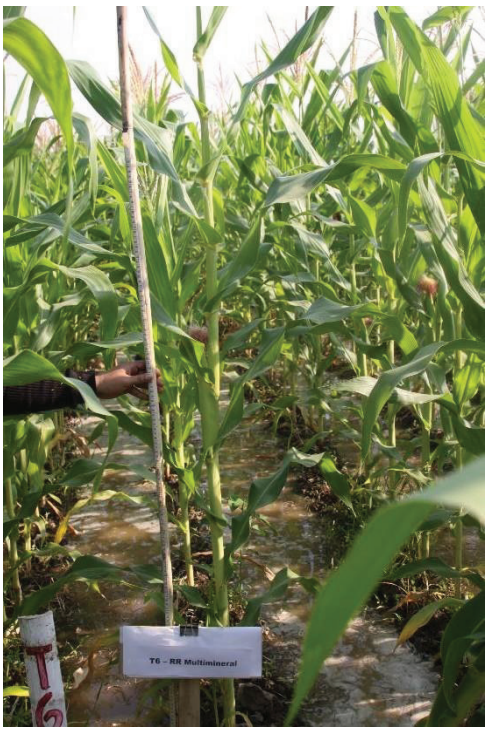
T3 - RRIF + 1/2 RRMM



T4 - RRIF + RRMM



T5 - RRIF + 1 1/2 RRMM



T6 - RRMM

PHOTO DOCUMENTATION 123 DAP



T1 - Control



T2 - RRIF



T3 - RRIF + 1/2 RRMM



T4 - RRIF + RRMM



T5 - RRIF + 1 1/2 RRMM



T6 - RRMM



T1 - Control



T2 - RRIF



T3 - RRIF + 1/2 RRMM



T4 - RRIF + RRMM



T5 - RRIF + 1 1/2 RRMM



T6 - RRMM