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A Study of Water Soluble Fertilizers and Micronutrients on finger diameter during growing periods of Banana (CV. Grand Nain)

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ABSTRACT

During the present studies Different water soluble treatments with and without micronutrients treatments were applied to the banana plants of cv. grand nain cultivar. The treatments were applied for two years. The fertilizer treatment applied by conventional methods was served control during two trial years.

It was observed that all the fertilizer treatments were found to be stimulatory for the growth in diameter of fingers as compared to the controlled treatments during first and second year. It was interesting to note that the finger diameter was found to be more by the application of 75 % RDF through WSF (12:61:00, 13:0:45 and Urea) M_2 treatment during both the years. It was followed by application of 75% RDF through WSF (Urea, Orthophosphoric acid and White potash) M_4 and 50 % RDF through WSF (12:61:00, 13:0:45 and Urea) M_1 while the finger diameter was found to be very less (10.46 cm) by the application of 50% RDF through WSF (Urea, Orthophosphoric acid and White potash) M_3.

Introduction:

The banana (*Musa paradisiaca* L.) an important fruit crop of the world. It is consumed by human beings since centuries long back. It is known to be man's first food and hence called it as Adams fruit. It is highly nutritious. It is cheap and hence nicknamed as **poor man's apple**.Apart from using banana as food, the fruit, leaves and other plant parts are used in several occasions and religious purposes.It is evident from the literature that there are about 250-300 cultivated banana varities in India. About 90 per cent farmers in Nanded district used to grow grand nain cultivar. Grand Nain is suitable for Nanded region in terms of vigour, yield, quality and long shelf-life.The yield and quality of banana requires vegetative growth and good vegetative growth requires recommended dose of macro and micronutrients. The macronutrients (Nitrogen, Phosphorous and Potassium) promote vegetative growth and production. The micronutrients in small dose promote enzymatic activities and synthesis resulting into high yield and quality (Kumar, 2002, Das, 2003)

Considering these facts the research topic entitled A Study of Water Soluble Fertilizers and Micronutrients on Phosphorous content of leaves during growing periods of Banana (CV. Grand Nain) was carried out.

Materials and Methods

During the present studies two central fingers of third hand of the bunch of the test cultivar of banana was measured with the help of measuring tape. The average finger diameter was calculated. Pooled and statistical analysis were worked out and results are presented in table – 1, 1a and figure – 1.

Treatment Details

The details of application of fertilizers scheduled during the research work is

Details of application schedule of fertilizers

Treatmetns	Treatment Details
I. Main Plot treatments	
M_1	50 % RDF through WSF (12:61:00, 13:0:45 and Urea)
M_2	75 % RDF through WSF (12:61:00, 13:0:45 and Urea)
M_3	50% RDF through WSF (Urea, Orthophosphoric acid and White potash)
M_4	75% RDF through WSF (Urea, Orthophosphoric acid and White potash)
M_5	100 % RDF through soil application (Urea, SSP and MOP)
II. Sub-Plot treatments	
S_0	Without micronutrients
S_1	With micronutrients
Replications	4 (Four)
Design	Split plot Design (SPD)
Year (Seasons)	Two (2015-16 and 2016-17)
Location	A/P Pardi (Mukta) Tq. Ardhapur Nanded district of Maharashtra state
Crop and Cultivar	Banana Cv. Grand Nain
Spacing	Row to row 1.8 meters and plant to plant 1.5 meters
Number of plants/treatment	16
Total number of plants	640
Total number of treatments	10 (Main plot treatments 5 x Sub-plot treatments 2)

WSF = water soluble fertilizers through fertigation
RDF = Recommended Dose of Fertilizer (200:160:200 grams NPK per plant)
NPK=Nitrogen, Phosphorous and Potasssium
SSP=Single Super Phosphate
MOP=Murate of potash

Results

From the results presented in table – 1, 1a and figure – 1 it is clear that all the fertilizer treatments were found to be stimulatory for the growth in diameter of fingers as compared to the controlled treatments during first and second year. It was interesting to note that the finger diameter was found to be more (13.33 cm) by the application of M_2 treatment during both the years. It was followed by application of M_4 and M_1 while the finger diameter was found to be very less (10.46 cm) by the application of M_3

Table-1: Studies on application of water soluble fertilizers and micronutrients in relation to Finger Diameter during growing period of Grand Nain cultivar of Banana.

Treatments	Finger diameter (cm)		
	Ist year	IInd year	Pooled
Main Plot treatments: Water soluble fertilizer treatments (M)			
M_1	11.33	11.74	11.53
M_2	13.33	13.33	13.33
M_3	10.46	10.74	10.60
M_4	12.08	12.55	12.31
M_5	9.53	9.70	9.61
S.Em. ±	0.46	0.41	0.26
CD@5%	1.43	1.27	0.73
Sub Plot treatments: Micronutrient treatments (S)			
S_0	11.09	11.21	11.15
S_1	11.60	12.02	11.81
S.Em. ±	0.09	0.11	0.16
CD@5%	0.28	0.33	0.46
Interactions			
M×S			
S.Em. ±	0.21	0.24	0.36
CD@5%	NS	NS	NS
Y×M			
S.Em. ±			0.36
CD@5%			NS
Y× S			
S.Em. ±			0.23
CD@5%			NS
Y×M×S			
S.Em. ±			0.52
CD@5%			NS
CV.	14.61	14.14	15.98
GM.	**11.34**	**11.61**	**11.48**

Table-1a: Significance and at par values of finger diameter based on statistical analysis resulted by the treatments of water soluble fertilizers and micronutrients during growing periods of Banana cultivar Grand Nain

Finger diameter								
Year/ Pooled	**Main Plot**					**Sub Plot**		**Interactions**
I Year								

	M_2	M_4	M_1	M_3	M_5	S_1	S_0	NS
	13.33	12.08	11.33	10.46	9.53	11.60	11.09	
II Year	M_2	M_4	M_1	M_3	M_5	S_1	S_0	NS
	13.33	12.55	11.74	10.74	9.70	12.02	11.21	
Pooled	M_2	M_4	M_1	M_3	M_5	S_1	S_0	NS
	13.33	12.31	11.53	10.60	9.61	11.81	11.15	

Indicates values at a par with each other

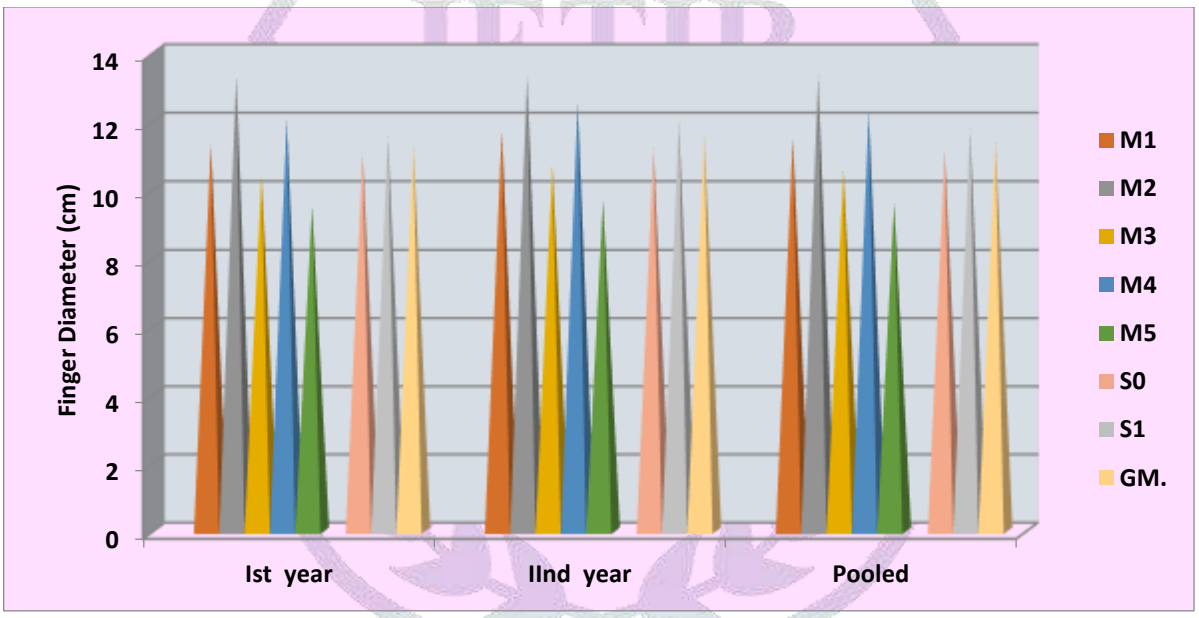

Figure-1: Studies on application of water soluble fertilizers and micronutrients in relation to Finger Diameter during growing period of Grand Nain cultivar of Banana.

Discussion:

During the present studies the effect of water soluble fertilizers and micronutrients on fruit characters of grand nain cultivar of banana was observed during the period of two years. The fruit characters in terms of finger diameter, were found to be greatly influenced by the application of dose of water soluble fertilizers through drip fertigation. The test cultivar under the fertilizer treatments found to be showed increase in finger length as compared to the finger length in the test cultivar under conventional method of application of fertilizers. It was also observed that the finger length. The significant results may be due to timely supply of nutrients with appropriate amounts. The early flowering and maturity of the test cultivar, may be due to increase cell division, enzyme action and reactions, etc. stimulated by the dose of water soluble fertilizer with micronutrients. Similar results were found to be observed by different workers in different plants under different conditions by the application of fertilizers and micronutrients.

Conclusion:

The fertilizer treatment M_2 S_1 75 % RDF through WSF (12:61:00, 13:0:45 and Urea) with micronutrients was found to be superior and had longer finger diameter.

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