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**Abstract:** Fruit crops are widely grown in West Hararghe Zone by small households and plays significant role for income generation and nutrition. Plantains are cooking type's banana producing fruits that remain starchy at maturity and need processing before consumption. Even though the environment is suitable for the production of fruit, the productivity of the crop is highly influenced by low yielding variety and low moisture. Therefore, the objective of the studied was to identify high yielding, drought and disease resistant/tolerant Plantain Banana varieties at Mechara onstation, West Hararghe Zone. Four plantain varieties were brought from Melkasa Agricultural Research Center and evaluated for agronomic and yield and yield related traits using Completely Randomized Block Design in three replications. The Analysis of variance results revealed significant variation among plantain varieties for all traits over both harvesting cycles except Fruit diameter (cm), number of fruit per bunch and unmarketable yield. The highest bunch weight, number of hands per bunch, number of fruits per bunch, marketable yield had recorded from Nijiru variety followed by Kardaba. Nijiru variety was resistance to banana disease (Sigatoka and Panama disease) as compared to the other varieties. Whereas the lowest bunch weight, number of fruits per bunch, marketable yield, total yields was observed from Matoke variety. The Pearson correlation coefficient showed that average bunch weight, Fruit diameter, number of finger per hand and Marketable yield were positively correlated to total yield. Therefore, it's concluded that Nijiru variety was well performed and can be recommended for the growers in Daro Lebu district and similar agro-ecology.

Keywords: Banana, Bunch, Cooking, Plantain, Varieties

# 1. Introduction

Bananas and plantains (Musa spp.) are considered as the world's most important fruit and the fourth most important staple food crop [1]. They provide a starch staple across some of the poorest parts of the world in Africa and Asia. The all year round fruiting habit of banana and plantains puts the crop in a superior position in bridging the hunger gap' between crop harvests. Nearly all edible plantain cultivar are derived from two wild species, M. acuminate and M. balbisiana [2]. These wild species are classified on the basis of the proportion of the genetic constitution contributed by each parental source [2]. Plantains are always cooked before consumption and are higher in starch than bananas. These are known as plantains are plants producing fruits that remain starchy at maturity and need processing before consumption [2, 3].

Banana and plantain is contributes significantly to food and income security of people engaged in its production and trade, particularly in developing countries. The plantain fruit is nutritional and contains high levels of calories, potassium, vitamin C, magnesium and vitamin B6 [2]. There are two types of bananas: the sweet dessert and the cooking banana (including plantains). The dessert banana is left to ripen and then eaten raw, while the cooking banana is peeled and cooked into a dish [2]. Plantains are usually cooked and not eaten raw unless they are very ripe. It is similar to unripe dessert bananas in exterior appearance, although often larger; the main differences in the former being that their flesh is starchy rather than sweet, they are used unripe and require cooking [4].

Plantain is drought and disease tolerant fruits than desert banana (M. balbisiana). The plantain cultivars containing the B-genome have been reported to exhibit higher tolerance to a biotic stresses [5]. The cultivars grown vary with altitude. For instance, at lower elevations below 1,200 meters above sea level (masl) plantains are mainly cultivated [6, 7].

Fruit crops are widely grown in Ethiopia from low to highland agro ecologies. The dessert banana is the major fruit crop grown in different parts of the country and leading both in area and production among the fruit crops. About 104,421.81 hectares of land is under fruit crops in Ethiopia; 2.5 m was used for the trail. Agronomic practice was applied uniformly for all treatments.

The plants were spaced at 2.5m x 2.5m providing a population of 1600 plants ha<sup>-1</sup> in the first year, and three different aged plants (parent, first ratoon and second ratoon) per mat in the remaining three years [9]. Weeds were controlled by hand hoeing. All management practices were given for all experimental plots. Nutrition of 150g urea and 70g Diammonium phosphates (DAP/NPS) were given to each plant in the orchard. From this experimental orchard, bunches were examined about 3 months before harvest in order to make propping as per the requirement of the plant.

The traits evaluated included bunch weight, number of hands per bunch, number of fingers per hand, fruit length, fruit diameter, fruit weight, and marketable and total fruit Analysis of variance was conducted using Genstat statistical software package (18<sup>th</sup> edition). The mean separation for any significant effect of the varieties was done with least significant difference test (LSD) at 5% and Correlation Coefficients among the traits were carried out using procedure of SAS software Version 9.2.

# **3. Results and Discussion**

### A

The results of analysis of variance (ANOVA) showed the presence of significant difference among the varieties for all traits in the first and second harvesting cycle except Unmarketable yield (Tables 1 and 2). All the parameters were significantly increased with the harvesting cycle/crop cycle of plantain varieties. This result was in agreement with other reported that both genotypes and cropping cycle significantly influence the yield and other growth trait of the banana cultivars [12].

Mean yield and yield components of plantain banana varieties at Mechara on station, 1st harvesting cycles in 2 1/"1# cropping season.

Varieties	FD	ABW	NFH	NHB	MY	UMY	TY
Nijiru	3.4 <sup>ab</sup>	5.7 <sup>a</sup>	53 <sup>a</sup>	5.67 <sup>a</sup>	19.37a	0.66	20.02 <sup>a</sup>
Cardaba	3.2 <sup>b</sup>	4.5 <sup>ab</sup>	47 <sup>b</sup>	3.67 <sup>b</sup>	13.79 <sup>c</sup>	0.48	14.26 <sup>c</sup>
Matoke	3.23 <sup>b</sup>	3.4 <sup>b</sup>	34.33°	4 <sup>b</sup>	12.59 <sup>c</sup>	0.38	12.97 <sup>c</sup>
Kitawira	3.63 <sup>a</sup>	3.2 <sup>b</sup>	50.67 <sup>a</sup>	4 <sup>b</sup>	16.49b	0.8	17.29 <sup>b</sup>
Mean	3.4	4.1	47	4.3	15.56	0.58	16.14
LSD	0.25	1.4	3.35	0.67	1.54	ns	1.43
CV%	3.7	16.8	3.6	7.7	15	50.4	4.4

Note: TY=Total Yield (ton ha<sup>-1</sup>), MY=marketable yield (ton ha<sup>-1</sup>), UM=unmarketable yield (ton ha<sup>-1</sup>), FD=fruit diameter (cm), ABW=average bunch weight (kg), NFH=Number fruit per bunches, NHB=Number of hands per bunches

	M	ean yield and	l yield cor	nponents of	<sup>i</sup> plantain	banana v	arieties at l	Mechara	on station, 2	2 <sup>nd</sup> harvesting	cycles in 2	1#"1\$ cropping season.
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Varieties	FD	ABW	NFH	NFB	UMY	MY	TY	DR
Nijiru	3.7ab	6.5a	55a	5a	3.8	32.4a	36.2a	1c
Cardaba	4.2a	5.1bc	31.7c	4b	4.2	27.1ab	31.3ab	5a
Matoke	3.2b	4.34c	47ab	4.3ab	3.3	20.3b	23.6b	1c
Kitawira	4ab	5.83	35bc	3.67b	2.4	20.1b	22.5b	2b
Mean	3.8	5.4	42.7	4.25	3.4	26	29.5	2
LSD	0.8	1.4	14.5	0.9	1.9ns	11.3	10.8	0.6
CV%	10.3	16.8	17.4	11.1	28.3	21.6	18.4	15.1

Note: TY=Total Yield (ton  $ha^{-1}$ ), MY=marketable yield (ton  $ha^{-1}$ ), UM=unmarketable yield (ton  $ha^{-1}$ ), FD=fruit diameter (cm), ABW=average bunch weight (kg), NFH=Number fruit per bunches, NHB=Number of hands per bunches

Varieties	FD	ABW	NFH	NFB	MY	UMY	TY	DR	
Cardaba	3.8	4.78ab	39.5	6.2b	20.3ab	2.4	22.7ab	5a	
Kitawira	3.7	3.8b	42.7	7ab	18ab	1.6	19.6b	2b	
Matoke	3.4	4.5b	40.8	7.8ab	16.4b	1.8	18.2b	1c	
Mean	3.56	4.8	45.8	7.4	20	2	22	2.3	
LSD	0.5ns	1.49	26.9ns	1.9	7.8	0.9ns	7.7	0.6	
CV%	10.6	28.5	38.7	21.8	32	37.3	28.9	24.3	

Note TY=Total Yield (ton  $ha^{-1}$ ), MY=marketable yield (ton  $ha^{-1}$ ), UM=unmarketable yield (ton  $ha^{-1}$ ), FD=fruit diameter (cm), BW=bunch weight (kg), NFH=Number fruit per bunches, NHB= Number of hands per bunches

Average bunch weight: Varieties showed significant difference on Average bunch weight. The highest bunch weight was shown on Nijiru (6.1kg) followed by kardaba (4.78kg) variety, while the lowest bunch weight had recorded for Kitawira (3.8kg) variety. Number of finger per hand and number of finger per bunch: the results of analysis of variances showed that the presence significant difference among varieties for number finger per bunch while non-significant difference for number of finger per hand. This may due to Varietal difference causes significant difference in number of finger per bunch. The Nijiru variety produced more number of finger per hand (54.2) and number of finger per bunch (8.4) and was statistically superior to the other varieties. Nevertheless, Cardaba variety produced the less number of finger per hand (39.5) and finger per bunch (6.2). However, other scholar stated that Cardaba contained 88 % more edible portions per unit fresh weight than the peel [13]. The highest number of finger per hand in Nijiru variety was most likely due to the fruit bearing capacity of the variety and more fruit per bunch nature which leads to contain high number of finger per hand. These results in agreement with the reports by other workers indicate average number of fingers per bunch ranges from 27 to 80 [14].

Marketable yield and Total yield (ton  $ha^{-1}$ ): There was significant difference (P<0.05) among plantain varieties

### 4. Conclusion and Recommendation

The results of analysis of variance showed all the yield and yield related parameters were significantly affected by varieties except fruit diameter, number of fruit per hand and unmarketable yield. Nijiru Variety was superior over all varieties for average bunch weight (6.1kg), number of finger per bunch (54.2), marketable yield (25.6) and total yield (27.9 ton ha<sup>-1</sup>). Moreover, Nijiru variety gave high yield over other varieties in both harvesting cycle, indicating that the Nijiru variety is stable and can sustain reasonable amount of yield regularly. Therefore, it can be concluded that Nijiru variety is recommended for further demonstration in Daro Lebu and similar agro- ecologies.

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