EVALUATION OF DIFFERENT COFFEE VARIETIES (*Coffea arabica*) AT AGRICULTURE RESEARCH STATION (HORTICULTURE), POKHARA, KASKI

YR Bhusal*, KB Thapa*, and R. Chaudhary**
*Agriculture Research Statopm (Horticulture), Pokhara,
**NTCDB, Pokhara

ABSTRACT

An experiment was conducted at ARS (Horticulture), Malepatan to evaluate six different varieties of coffee namely: Pacamara, Pacas, Tekisik, Chhetradeep (a locally grown variety), Hawai Kuna and Indonesia in 2009 and 2010. Varieties were evaluated for their yield and yield attributing characteristics. Data recorded were girth (cm) at 20 cm from ground, number of bearing and non bearing branches per plant, numbers of nodes/branch, number of bearing nodes/branch, number of cherry /node and cherry yield (kg ha^{-1}) and analyzed by using statistical software Mstatc. Girth at 20 cm above the ground was found highest (13.75 cm) in variety Hawai Kuna. Similarly number of bearing and non bearing branches per plant was highest in variety Tekisik. Numbers of nodes per branch were found similar in all varieties but there was significant difference in number of bearing nodes per branch and highest was found in variety Hawai Kuna (7) which was followed by Tekisik (6), and Chhetradeep (6). Likewise, difference was observed in varieties in number of cherry per node which was found highest (4.22) in variety Indonesia and lowest (2.74) in Pacas. Cherry yield was found significantly highest (1818.80 kg ha^{-1}) in variety Tekisik which was followed by Pacas (1181.36 kg ha^{-1}), Chhetradeep (1515.18 kg ha^{-1}), Indonesia (997.63 kg ha^{-1}), Pacamara (907.08 kg ha^{-1}) and lowest in Hawai Kuna (887.25 kg ha^{-1}). There is positive correlation between cherry yield and other parameters like number of nodes/plant (r = 0.288), number of bearing nodes (r = 0.414) and number of cherry per node (r = 0.401) and negative correlation between Cherry yield and number of non bearing branches and all are statistically significant.

Key words- Coffee, cherry, variety, bearing

INTRODUCTION

Coffee (*Coffea arabica* L.) is indigenous to the highlands of Ethiopia and the Boma plateau in the Sudan where coffee forests still occur naturally in 1370-1830 m asl (Wringly, 1988). In Nepal, it was first introduced in Gulmi in 1938 AD (Dhaka,l 2061). Since then, it has been spread slowly in the other parts of the country. Coffee Development Center was established in Gulmi to conduct the training, development and research on coffee production techniques. With the establishment of Nepal Coffee Producers Association (NCPA), National Tea and Coffee Development Board (NTCDB) and formulation and implementation of National Coffee Policy-2060, coffee cultivation has received more attention and is considered one of the export commodities of the country. Coffee is being cultivated in around 1531 hectares of areas in 40 districts (Anon, 2067). Out of the total production of coffee in the country, almost 65% has been exported to Japan, America, Korea and other European countries and remaining 35% has been consumed in the country (NTCDB, 2066). There are different varieties of coffee under Arabica species. Different varieties have been growing in different coffee growing districts. Almost 17 varieties of Arabica coffee and 4 collections (with the location name where they are popular) have been collected and maintained at the Agriculture Research Station (Horticulture), Malepatan, Pokhara. There are varietal differences in the production and productivity of coffee as well as on the quality of the produce and performance of one variety may not suit to other location (Wrigley, 1988). Little work has been done in varietal evaluation in Nepal. The experiment was conducted on station to evaluate and characterize different varieties collected.

MATERIALS AND METHODS

Among the collected varieties, six varieties namely Pacamara, Pacas, Tekisik, Chhetradeep (locally grown variety), Hawai Kuna and Indonesia were taken for evaluation in 2009 and 2010. A total of 16 plants of each variety were planted during 2005 and 2006 in row and repeated four times. Data were taken from each plant. Observations taken were girth (cm) at 20 cm from ground, number of bearing and non bearing branches per plant, numbers of nodes/branch, number of bearing nodes/branch, number of cherry /node and cherry yield (kg ha^{-1}). No chemical fertilizers and chemical pesticides were used in the experiment. Farmyard manures, compost were used as organic manure and mineral oil, neem product and other locally prepared pesticides were used to control plant hopper and scales. Data observed were analyzed using the statistical software Mstatc and model used for the analysis was Randomized Complete Block Design (RCBD) combined over years.

RESULT AND DISCUSSION

Observation was taken on yield and different yield attributing characters and yield of coffee varieties and analyzed mean data have been presented in table 1.

Girth at 20 cm above ground (cm)

The measurement of girth was taken in each variety. It was found significantly higher in Hawaikuna but other varieties were at par. The maximum girth (13.75 cm) was recorded in variety Hawaikuna followed by Tekisik (10.35 cm), Pacas (10.21 cm), Indonesia (10.12 cm), Pacamara (9.25 cm) and least in Chhetradeep (9.11 cm).

Number of bearing branches per plant

The highest number of bearing branches per plant was found in variety Tekisik (33.10). The number of bearing branches per plant in varieties Hawaikuna (28.19), Indonesia (27.79), pacas (25) and Chetradeep (24.16) were found almost similar but significantly less numbers were recorded in variety Pacamara (20.54) but it was at par with Pacas and Chhetradeep.

Number of non-bearing nodes per plant

The number of non bearing branches per plant is also found highest in the variety Tekisik (21.47) which is statistically similar with Chetradeep (19.34) followed by Pacac (18.62), Pacamara(15.03) and least as 11 and 9.86 in Hawaikuna and Indonesia respectively.

Number of nodes per branch

The number of nodes per branch in all variety was found similar which range from 16 to 17.86 per branch. Statistically the numbers of nodes per branch were at par in all variety.

Number of bearing nodes per branch

The highest number of bearing nodes per branch was recorded in variety Tekisik (6.30) and similar number of nodes per branch was also recorded in Chetradeep (6.04) which were followed by Indonesia (5.50) and Pacas (4.96).The least numbers of nodes per branch was found in Pacamara (4.63).

Number of cherry per node

The highest number of cherries per node was found in the variety Indonesia (4.22) and Hawaikuna (3.97) which were followed by chhetradeep (3.53) and Tekisik (3.50). A few number of cherries per node was found 2.87 and 2.74 in variety Pakamara and Pacas respectively.

Fresh Cherry Yield (Kg ha^{-1})

The highest fresh cherry yield was found in variety Tekisik (1818.8 kg/ha) and Chhetradeep (1515.18 kg/ha). Similarly Pacas produced the yield of 1118.36 kg/ha. Significantly lower yield was recorded in varieties Indonesia (997.63 kg/ha), Pakamara (907.08 kg/ha), and Hawaikuna (887.25 kg/ha).

Table 1. Evaluation of different coffee (*C. arabica* L) varieties at ARS (Horticulture), Pokhara during 2009 and 2010.

Variety	Girth at 20 cm height (cm)	No. of bearing branch per plant	No. of non-bearing branch per plant	No. of nodes per branch	No. of bearing nodes per branch	No. of cherry per node	Fresh cherry yield (kg/ha)
Pakamara	9.25	20.54	15.03	16.01	4.63	2.87	907.08
Pacas	10.21	25.00	18.62	16.76	4.96	2.74	1181.36
Tekisik	10.35	33.10	21.47	16.86	6.30	3.50	1818.8
Chhetradeep	9.11	24.16	19.34	17.36	6.04	3.53	1515.18
Hawaikuna	13.75	28.19	11.00	17.81	5.06	3.97	887.25
Indonesia	10.12	27.79	9.86	16.10	5.50	4.22	997.63
Variety	**	**	**	NS	*	*	**
Year	**	NS	NS	NS	**	**	**
Var. xYear	NS	**	**	NS	NS	NS	NS
CV%	12.39	18.12	16.34	10.11	23.05	24.88	37.70
GM	10.46	26.46	15.89	16.82	5.75	3.48	1217.88
LSD $^{(0.05)}$	1.324	4.89	2.65	-	1.35	0.883	468.90

Correlation between cherry yield and other parameters

A positive correlation between cherry yield and other parameters like number of nodes/plant (r = 0.288), number of bearing nodes (r = 0.414) and number of cherry per node (r = 0.401) was found and all were found significant.

CONCLUSION

Among the different varieties evaluated Tekisik and Chhetradeep produced higher cherry yield at Malepatan, Pokhara condition. Although, other characters of Hawaikuna and Indonesia are higher as compared to high yielding varieties, their number of cherries per node were found less which leads to the lesser yield of the plants.

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