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Performance of high yielding varieties of finger millet (*Eleusine coracana*) under different fertility level in Garhwal region of Uttarakhand

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Abstract

A field experiment was conducted during *Kharif* season of 2017 at V.C.S.G. Uttarakhand University of Horticulture and Forestry, Ranichauri, Tehri Garhwal, Uttarakhand, India to study the effect of fertility level on different high yielding cultivar of finger millet under rainfed conditions of Garhwal hills of Uttarakhand. The experiment consisted of twelve treatments with four varieties namely VL 386, VL 352, GPU 45 and PRM 1 as main plots and three fertility levels *viz.* 75% recommended dose of fertilizer (RDF), 100% RDF and 125% RDF as subplots which were arranged in split plot design with three replication. The data indicated that VL 386 cultivar was the most economical high yielding cultivar of finger millet at 100% of the recommended dose of fertilizer for rainfed conditions of Garhwal hills of Uttarakhand under timely sown conditions.

Keywords: Finger millet, nutrient management

Introduction

Finger millet is the major crop of the small millet group. It was grown in Garhwal region on a sizable acreage of more than 52769 hectare with production of 81052 metric tons and productivity of 1539 kg/ha (Anon. 2016-17) ^[1]. Uttarakhand state average production of finger millet was 159606 metric tons from 107175 hectare area and productivity of 1489 kg/ha during 2016-17. Whereas, national average production of finger millet during 2015-16 was 1793 thousand tons with the productivity level of 1424 kg/ha from total area of 1259 thousand hectare (Anonymous, 2017) ^[2]. It is the traditional crop of Uttarakhand. It play very important role in the socio-economic condition of the small and marginal farmers of hill districts of Uttarakhand. Adoption of improved varieties and management practices such as use of fertilizers could improve finger millet yields of Garhwal region. The varieties producing higher amount of dry matter, use greater quantities of nutrients from soil. The various root characteristics vary in different varieties which may affect nutrient uptake. Hence there is need to evaluation different varieties under Garhwal condition for its suitability besides optimum fertilization schedules for achieving its potential yield.

Materials and Methods

A field experiment was conducted at the Gaja Research and Extension Centre, College of Forestry of VCSG Uttarakhand University of Horticulture and Forestry, Ranichauri, Tehri Garhwal, Uttarakhand, India during *Kharif* season of 2017 to evaluate the effect of different fertility levels on high yield varieties of finger millet under rainfed condition of Garhwal region. The soil was silty clay loam of medium depth with acidic pH (5.6) having 0.69% organic carbon, 212kg/ha available N, 16.33kg/ha available P and 405kg/ha available K. The experiment consisting of twelve treatments with four varieties namely VL 386, VL 352, GPU 45 and PRM1 as main plots and three fertility levels *viz.* 75% recommended dose of fertilizer (RDF), 100% RDF, 125% RDF as subplots were arranged in split plot design with three replication. The crop was sown in lines 25 cm apart with plant to plant distance 7.5 cm on 23.06.2017 and harvested on 10.10.2017. The crop was raised using standard package and practices recommended for the region. The crop was fertilized with RDF NPK @ 50:40:25 kg/ha using Urea, DAP, MOP. Data on yield performance and economics were recorded using slanted procedure. Climate of College of Forestry is humid and temperate type with chilled winter. The total precipitation during the crop season was recorded 1186.9 mm in 2017, whereas the maximum temperature varied between 22.2 to 24.6 °C in 2017 during cropping season. Similarly minimum temperature varied between 11.2 and 16.8 °C during *Kharif* season of 2017.

Result and Discussion

Among the tested varieties of finger millet, maximum grain yield (2107 kg/ha) was recorded with variety VL 386 which was significantly superior over to other tested varieties (Table 1). The grain yield of VL 386 was 28.3% higher than PRM 1. The lowest grain yield (1642 kg/ha) was observed in PRM 1. The maximum straw yield was also observed with variety VL 386 as compare to other tested varieties and minimum straw yield was recorded in GPU 45. Fertilizer level influence grain and straw yield significantly. Application of 100% recommended dose gave higher grain yield (1949 kg/ha) and straw yield (4712 kg/ha) than the 75% and 125% of RDF. The significant increase in seed yield in VL 386 variety at 100%

fertility levels was due to higher harvest index and balance application of nitrogen, phosphorus and potassium lead to better growth of finger millet. Tenywa *et al.* (1999) also found that application of nitrogen with phosphorus and manure with phosphorus produce better growth and yield of finger millet. Snakar *et al.* also reported application of N: P₂O₅: K₂O at 50:50:25 kg/ha increased finger millet yield compare to non-fertilized crop under rainfed conditions on alfisols in Bangalore, India. The maximum B: C ratio (2.13) was recorded in high yielding variety (VL 386) of finger millet because of higher net return (Rs.35269/ha). Among the fertility level maximum B:C ratio was observed at 100% RDF (1.92) due to higher gross and net return.

Table 1: Effect of different level of nitrogen on yield of finger millet varieties.

Treatments	Grain Yield (kg/ha)	Straw Yield (kg/ha)	Harvest Index (%)	Cost of Cultivation (Rs./ha)	Gross Return (Rs/ha)	Net Return (Rs/ha)	B:C Ratio
Verities							
VL 386	2107	4856	30.26	16583	51852	35269	2.13
VL 352	1731	3968	30.37	16583	42556	25973	1.57
GPU 45	1656	3867	29.98	16583	40854	24271	1.46
PRM 1	1642	4657	26.07	16583	42154	25571	1.54
SEm±	53	141					
CD (5%)	158	417					
Fertilizer level kg/ha							
75% NPK	1695	3932	30.12	15799	41764	25965	1.64
100% RDF	1949	4712	29.26	16583	48404	31821	1.92
125% RDF	1709	4366	28.13	17367	42912	25545	1.47
SEm±	38	94					
CD (5%)	131	324					

Conclusion

It may be concluded that VL 386 cultivar is the most economical high yielding cultivar of finger millet and may be recommended for rainfed conditions of Garhwal hills of Uttarakhand under timely sown conditions at 100% of the existing recommended dose of fertilizers.

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