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**Dr. Shiv Dayal**  
Assistant Professor/SMS,  
Agroforestry KVK, Matela, G.B.  
Pant Univ. of Ag. & Tech.,  
Pantnagar, Uttarakhand, India

**Dr. Kanchan Nainwal**  
Associate Professor/Associate  
Director, Agronomy  
KVK, Jeolikot, G.B. Pant Univ.  
of Ag. & Tech., Pantnagar  
Uttarakhand, India

**Dr. Dipali Tewari**  
SMS/Asstt. Profesor, Vegetable  
Science, KVK, Matela, G.B.  
Pant Univ. of Ag. & Tech.,  
Pantnagar, Uttarakhand, India

## Comparison of fodder sorghum high yielding hybrids with local variety in Almora district

**Dr. Shiv Dayal, Dr. Kanchan Nainwal and Dr. Dipali Tewari**

### Abstract

An On farm testing (OFT) was carried out by Krishi Vigyan Kendra, Almora during kharif season on 2013-14, 2014-15, 2015-16 and 2016-17 at farmers fields in village Shela-Uleni in Chaukhtia block in Uttarakhand, to compare the green fodder sorghum yield of local available variety with the high yielding hybrid (CSH20MF and CSH24 MF) for the enhancement of availability of green fodder in hilly area. that the percentage increase in yield of fodder sorghum hybrid CSH20MF over local variety was 57.63%, 62%, 47.92% and 98.26% continuously during 4 years from 2013-14, 2014-15, 2015-16 and 2016-17, respectively. In comparison of local variety to second hybrid i.e. CSH 24 MF, the percentage increase in yield of fodder sorghum hybrids CSH24MF over local variety was 69.79%, 49.32%, 59.84% and 80.02% continuously during 4 years from 2013-14, 2014-15, 2015-16 and 2016-17, respectively. However, both the fodder sorghum hybrids performed better than local variety during all the four years. It was further found that B: C ratio was maximum in T3 (CSH24MF) during 2013-14 i.e.2.83. Thus, the productivity of fodder sorghum could be increased with the adoption of high yielding varieties. The study resulted to convincing the farming community for higher productivity and returns.

**Keywords:** Green fodder, OFT, fodder sorghum hybrids, B: C ratio, fodder yield

### Introduction

In Uttarakhand, nearly half of the arable farming takes place in the hilly slopes, on small terraced plots of land, often as small as 100sq.m. almost all of it rainfed. Agriculture along with animal husbandry is still the principal occupation and source of livelihood for over 70% of its population. But in recent years, the farmers of hilly region are not taking much more interest in agriculture due to the problem of wild animals and also the farmers are mostly marginal and sub marginal with fragmented land. So, for livelihood and regular income to the marginal, sub marginal and landless farmers, animal husbandry mainly dairy occupation may be the good alternative.

In hilly area of Uttarakhand, milch animals are more but their productivity is very low. The main reason for low productivity is malnutrition, under- nutrition or both, besides the low genetic potential of the animals. It is well accepted that feeding dairy animals is incomplete without including green fodder in their diet because green fodder have cooling effect on the animal body, more palatable containing easily digestible nutrients, provide fresh effectively utilizable nutrients in natural forms and slightly laxative. Inclusion of green fodder in ration of dairy animals decreases amount of concentrate feeding and thus increases profit (Anon., 2017), therefore, green fodder plays major role in feed of milch animals, thereby providing required nutrient for milk production and health of the dairy animals.

Total green fodder supply in Uttarakhand is about 105.12 lakh mt while requirement is about 197.40 lakh mt e.i. 46.74% is deficit (Singh *et al.*, 2005) [5]. Scarcity of green fodder is due to small size of farm holdings with fragmented land and lack of irrigation facilities. Also fodder is by and large not cultivated and animal rearers have to depend on forest, grasslands pastures and local grasses on wastelands and terraces. For supply of nutritious green fodder, there is a need of increasing fodder production and productivity by cultivation of fodder crops. Today many fodder crops and their high yielding varieties are available, but there is need to make aware the farmers so that they can earn more profit.

Among non leguminous fodder crops, sorghum [*Sorghum bicolor* (L.) Moench] locally known as jowar or chari is one of the five top cereal crops in the world. It is extremely drought tolerant, making it an excellent choice for arid and dry areas. Sorghum is a major multi-purpose crop grown for forage, grain and ethanol production. It's quick growing habit, high yield regeneration potential, better palatability, digestibility and drought tolerance makes it good choice of fodder for farming community. It can be grazed (young or as a differed fodder), cut fresh, made into hay or ensiled (Pedersen *et al*; 2000).

### Correspondence

**Dr. Shiv Dayal**  
Assistant Professor/SMS,  
Agroforestry KVK, Matela, G.B.  
Pant Univ. of Ag. & Tech.,  
Pantnagar, Uttarakhand, India

In hilly areas some farmers are cultivating fodder Jowar crop in kharif season but their productivity is low due to use of non high yielding varieties and poor quality seed, undecomposed FYM, negligible use of chemical fertilizers and non adoption of weed control measures. Considering the above constraints in mind and with continuous interaction with the farmers, an on-farm-trial (OFT) was planned and conducted in village Shela-Uleni of Chaukhutia block in Ranikhet-Chaukhutia road about 75 km from the KVK in the Almora District in Uttarakhand, by Krishi Vigyan Kendra, Almora during kharif season of 2013-14, 2014-15, 2015-16 and 2016-17 to enhance the green fodder yield of fodder sorghum, thereby increasing the availability of green fodder.

### Materials and Methods

The present on-farm-testing was carried out by Krishi Vigyan Kendra, Almora during kharif season of 2013-14, 2014-15, 2015-16 and 2016-17 in Uttarakhand at farmers' fields in village Shela-Uleni of Chaukhutia block in Ranikhet-Chaukhutia road about 75 km from the KVK to compare the yield of local available low yielding variety with the high yielding hybrids (CSH20MF and CSH24MF). Sorghum crop was sown from mid of May to early June and first cut was done after 50-55 days of Sowing and second cut was done after 25-30 days of first cut. The trial was carried out with three treatment i.e. T1 (Farmers practice: local variety), T2 (CSH20MF) and T3 (CSH24MF) with plot size 200sq.m. and five replication (5 farmer) with recommended packages of practices.

The local variety of the crop was sown @ seed rate of 35 kg/ha by broad casting while high yielding hybrids (CSH20MF and CSH24MF) were sown in line sowing of at row spacing of 15 cm. For the study, green fodder yield (q/ha), increase in yield (%), Net return (Rs./ha) and benefit Cost Ratio (B:C ratio) was calculated. In this study, critical input in the form of high yielding hybrid seed and fertilizer were provided by KVK to farmers.

### Results and Discussion

**Yield:** Yields were calculated in the form of green fodder and the results of the study showed that the percentage increase in

yield of fodder sorghum hybrid CSH20MF over local variety was 57.63%, 62%, 47.92% and 98.26% continuously during 4 years from 2013-14, 2014-15, 2015-16 and 2016-17, respectively (Table 1). In comparison of local variety to second hybrid i.e. CSH 24 MF, the percentage increase in yield of fodder sorghum hybrids CSH24MF over local variety was 69.79%, 49.32%, 59.84% and 80.02% continuously during 4 years from 2013-14, 2014-15, 2015-16 and 2016-17, respectively. The result indicated that on-farm-trial on high yielding hybrids have given good impact over farmers practices i.e. local variety (Table 1), thereby increasing their fodder yields. Similar results were reported by Iyanar *et al.*, 2015<sup>[6]</sup>, Pahuja *et al.*, 2012<sup>[8]</sup> & Ram Asarey *et al.*, 2015<sup>[7]</sup>.

**Net Returns and Benefit Cost Ratio:** The input (seed, total mandays, Ploughing and other cultivation practices) and produced prices prevailed during the study of trial were taken for calculating the Net returns and Benefit Cost Ratio. The cultivation of high yielding varieties of fodder sorghum resulted in higher Net returns and B:C ratio during 4 years from 2013-14 to 2016-17 as compared to local variety. Table 2 indicates that maximum net returns was noticed in 2014-15 in both the treatments i.e. Rs.73900.00 in T2 (CSH20MF) and Rs.64766.00 in T3 (CSH24MF). It was further found that B:C ratio was maximum in T3 (CSH24MF) during 2013-14 i.e.2.83. High benefit cost ratio also advocated that economic viability of the trial which motivate the farmers towards adoption of intervention in demonstration. Similar results were reported by Srinivas *et al.*, 2014<sup>[1]</sup> & Gurumukhi and Mishra, 2003<sup>[3]</sup>.

**Conclusion:** It can be concluded that both the high yielding hybrids i.e. CSH24MF and CSH20MF performed better in terms of green fodder yield and gave higher net returns and B:C ratio as compared to local variety. On the basis of above on-farm-trial both the high yielding hybrid may be recommended for adoption by the farmers. Finally it can be concluded that use of improved agronomic practices along with HYV's may enhance the fodder productivity and availability of green fodder and thereby increasing the income of the farmers.

**Table 1:** Sorghum fodder yield influenced by improved (hybrids) and local varieties from 2013-14 to 2015-16.

Technology Option	No. of Trials	Green Fodder Yield(qt./ha)				Increase in Yield (%) over local			
		2013-14	2014-15	2015-16	2016-17	2013-14	2014-15	2015-16	2016-17
T1:farmers practice(Local)	05	576.00	721.00	409.00	517.00	-	-	-	-
T2: CSH20MF		908.00	1168.00	605.00	1026.00	57.63	62.00	47.92	98.26
T3 :CSH24MF		978.00	1076.00	653.75	931.60	69.79	49.32	59.84	80.02

**Table 2:** Net Return (Rs./ha) and B:C ratio of fodder sorghum as influenced by improved(hybrids) and local varieties from 2013-14 to 2016-17.

Technology Option	No. of Trials	Net Return (Rs./ha)				B:C Ratio			
		2013-14	2014-15	2015-16	2016-17	2013-14	2014-15	2015-16	2016-17
T1:farmers practice(Local)	05	23825.00	30045.00	-1600.00	5050.00	1.74	1.71	0.96	1.11
T2: CSH20MF		56200.00	73900.00	17600.00	55550.00	2.62	2.72	1.41	2.18
T3 :CSH24MF		63200.00	64766.00	22475.00	33450.00	2.83	2.50	1.52	1.98

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