Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
www.phytojournal.com
JPP 2020; 9(2): 1806-1808
Received: 12-01-2020
Accepted: 14-02-2020

SA Biradar
ICAR-Krishi Vigyana Kendra, Hittinalli Farm, Vijayapura, University of Agricultural Sciences, Dharwad, Karnataka, India

Mallappa B
ICAR-Krishi Vigyana Kendra, Hittinalli Farm, Vijayapura, University of Agricultural Sciences, Dharwad, Karnataka, India

Shivalingappa Hotkar
ICAR-Krishi Vigyana Kendra, Hittinalli Farm, Vijayapura, University of Agricultural Sciences, Dharwad, Karnataka, India

Vivek S Devarnavadagi
ICAR-Krishi Vigyana Kendra, Hittinalli Farm, Vijayapura, University of Agricultural Sciences, Dharwad, Karnataka, India

Corresponding Author:
SA Biradar
ICAR-Krishi Vigyana Kendra, Hittinalli Farm, Vijayapura, University of Agricultural Sciences, Dharwad, Karnataka, India

Production potentiality of various nutri - millets under Northern Dry Zone of Karnataka

SA Biradar, Mallappa B, Shivalingappa Hotkar and Vivek S Devarnavadagi

Abstract
A field experiment was conducted at ICAR- Krishi Vigyana Kendra, Vijayapura University of Agricultural Sciences, Dharwad during *Kharif* - 2019 to study the Production potentiality of various nutri - millets under Northern Dry Zone of Karnataka. The experiment was laid out in randomized complete block design having four replications. There were five treatment involving five small millets *viz*., Foxtail millet, Barnyard millet, Proso millet, Kodo millet and little millet. The different small millets were evaluated for growth, yield and yield parameters viz., plant height, ear length, grain yield and straw yield. Among different small millets, foxtail millet was recorded significantly higher plant height (112 cm), ear length (18 cm), grain yield (17.29 q ha^{-1}) and straw yield (3.56 t ha^{-1}) compared to little millet (93 cm, 14.99 cm, 14.92 q ha^{-1} and 2.03 t ha^{-1}, respectively), However which was on par with barnyard millet (109 cm, 17.27 cm, 15.97 q ha^{-1} and 3.15 t ha^{-1}, respectively). Among different small millets, foxtail millet has recorded higher gross returns (47253 ₹/ha), net returns (31717 ₹/ha) and benefit cost ratio (3:04). Whereas, little millet shown the lesser gross returns (40609 ₹/ha), net returns (25073 ₹/ha) and benefit cost ratio (2.61).

Keywords: Millets, growth, yield and economics

Introduction
Future trends of food requirement indicate that millet crop production will increase globally because of the increase in number of millet consumers as they are nutritionally miles ahead of rice and wheat. Millets is known to be 'crops of the future' as they can be well adapted and cultivated under harsh environment of arid and semi-arid region (RESMISA, 2012) [7]. During the present days of climatic change, high energy farming is slowly replaced with low energy traditional farming with climatic resilient crops like small millets for conservation and to aid in making sound and stable management under increasing evidence of less seasonal rainfall, increase in temperature and frequent occurrence of extreme weather events. Under such situations small millets is best suited as it is of short duration, known for its drought tolerance and can withstand severe moisture stress and also suited to wide range of soil conditions with high energy use efficiency (Devi *et al*., 2011) [1]. In recent years there is huge awareness among people about healthy, nutritive millets and there is a demand for small millets due to its nutritional quality and better adaptability. The demand for small millets has risen drastically but the production of small millets is relatively low. The reason behind is, it is mostly grown in low fertile soil. Inspite of all this, due to the growing importance and demand, the area under small millets is catching up under rainfed condition. Therefore the present study were undertaken to know the performance of various small millets under Northern Dry Zone of Karnataka.

Material and Methods
The experiment was conducted at instructional farm of ICAR- Krishi Vigyana Kendra, Vijayapura, University of Agricultural Sciences, Dharwad (Karnataka). There were 5 treatment viz., Foxtail millet, Barnyard millet, Proso millet, Kodo millet and little millet. The experiment was laid out in randomized block design with four replications. The soil of the experimental site belongs to vertisols (medium deep black soils) having alkaline pH (8.4), medium in available nitrogen (256 kg ha^{-1}) and phosphorus (22.3 kg ha^{-1}) and high potassium content (341 kg ha^{-1}) with soil organic carbon content of 0.52 per cent. The field was prepared by repeated ploughing and harrowing. FYM was applied @ 5 t ha^{-1} to all the treatments 15 days prior to sowing. The small millets *viz.*, Foxtail millet, Barnyard millet, Proso millet, Kodo millet and little millet seeds were sown by hand dibbling at 30×10 cm spacing with seed rate of 12 kg ha^{-1} on August 6th with monsoon rain. The full dose of N, P and K through urea, MOP and DAP were applied as per as package of practices of UAS Dharwad. Initially 2-3 seeds per hill were hand dibbled and 15 days later the plants were thinned by keeping to

maintain required plant population per plot. The gross plot size of individual treatments was 4.5 m x 5.00 m. Various observations on growth and yield components were recorded on five randomized plants in each treatment and mean values were calculated. The grain and stover yields were recorded on per plot basis and later converted to per hectare. The data collected on the different parameters were statistically analyzed by the 'F' test for significance as suggested by Gomez and Gomez (2010) [2]. The critical difference (CD) was computed at 5% probability.

Results and Discussion

Different small millets significantly influenced the growth and yield attributes. The results of the present investigation revealed that foxtail millet significantly increased the plant height (112 cm), However which was on par with barnyard millet (109 cm). Significantly lower plant height was recorded with little millet (93 cm).

The same trend was also noticed in ear length, foxtail millet was recorded significantly higher ear length (18 cm) as compared to little millet (14.99 cm) but which was significantly on par with barnyard millet (17.27 cm) (Table 1). Increased plant height and Ear length might be due to genetically make up of plant itself, which is governed by vegetative growth of crop as it played vital role in accelerating all the physiological processes in plants. These findings are in accordance with finds of Hoda *et al*, 2015 [3] & Pradhan *et al.* 2011 [6].

The results revealed that grain yield and straw yield was significantly varied among different small millets. Among the four small millets, Foxtail millet was recorded significantly higher grain yield and straw yield (17.29 q ha^{-1} and 3.56 t ha^{-1}, respectively) followed by little millet (14.92 q ha^{-1} and 2.03 t ha^{-1}, respectively), However which was on par with barnyard millet (15.97 q ha^{-1} and 3.15 t ha^{-1}, respectively) (Table 1). This might be due to the fact that better growth and development leading to higher grain yield. The same was obvious through the findings of Yadav *et al*. (2007) and Singh *et al*. (2015) [8]. The increase in stover yield of foxtail millet due to vertically expansion of plants with higher growth and dry matter production resulted in higher stover yield. Similar results were reported by Khafi *et al*., (2000) [5].

The benefit cost ratio (B: C ratio) was calculated to evaluate the economics of different small millet production. Among all millets grown, Foxtail millet has recorded higher gross returns (47253 ₹ ha^{-1}), net returns (31717₹ ha^{-1}) and benefit cost ratio (3:04). Whereas, little millet recorded the lesser gross returns (40609₹ ha^{-1}), net returns (25073₹ ha^{-1}) and benefit cost ratio (2.61) (Table 2).

The higher net income and benefit cost ratio with foxtail millet was mainly due to higher grain and stover yield. Lower net income recorded with little millet was mainly due to lower grain and stover yield. Similar result had also been reported by Joshi *et al.* (2014) [4].

Table 1: Analysis of variance for growth, grain yield and straw yield in different small millets.

Treatments	Plant height (cm)	Ear length (cm)	No. of tillers Plant $^{-1}$	Straw yield (t ha^{-1})	Grain yield (q ha^{-1})
T_1:Foxtail Millet	112	18.00	7.00	3.56	17.29
T_2 :Barnyard Millet	109	17.27	6.94	3.15	15.97
T_3 :Proso Millet	99	16.60	6.83	2.43	15.54
T_4 :Kodo Millet	100	15.08	5.96	2.24	15.02
T_5:Little Millet	93	14.99	5.03	2.03	14.92
S.Em±	1.24	0.27	0.58	0.35	0.54
CD at 5%	3.70	0.79	NS	1.04	1.60

Table 2: Different small millets as influence on Economics.

Treatments	Gross Returns (₹. ha^{-1})	Net Returns (₹. ha^{-1})	B:C ratio
T_1:Foxtail Millet	47253	31717	3.04
T_2 :Barnyard Millet	43623	28087	2.81
T_3 :Proso Millet	42347	26811	2.73
T_4 :Kodo Millet	40912	25376	2.63
T_5:Little Millet	40609	25073	2.61

Conclusion

From the above study, concluded that the foxtail millet found to be most suitable and produced more straw and grain yield. Therefore, it could be concluded that foxtail millet may be cultivated in satisfactory result from northern dry zone of Karnataka.

Acknowledgement

The authors are thankful to the ATMA, Department of Agriculture, Vijayapura for providing the financial assistance and also to the ATARI, Bangalore and host organization University of Agricultural Sciences, Dharwad.

Reference

1. Devi PB, Vijayabharathi R, Sathyabama S, Malleshi NG, Priyadarisini VB. Health benefits of finger millet (*Eleusine coracana* L.) polyphenols and dietary fiber: a review. J food. Sci. and tech. 2014; 51(6):1021-1040.
2. Gomez. Gomez Using technology in large statistics classes. Review of higher education and Self learning. 2010; 3(5):109-113.
3. Hoda IM, Salwa AA, El-Sayed AH. Performance of forage millet in response to combinatio ns of organic and inorganic fertilizers and bio-fertilizers. World J. Agril. Sci. 2015; 11(6):423-431.
4. Joshi A, Gupta JK, Choudhary SK, Paliwal DK. Efficiency of different nitrogen source, doses and split application on growth and yield of maize (*Zea mays* L.) in the Malwa region of Madhya Pradesh. J Agric. and Veterinary Sci. 2014, 39-42,
5. Khafi HR, Ramani BB, Mehta AC, Pethavi KV. Effects of different levels of nitrogen, phosphorus and spacing on yield and economics of hybrid bajra. Crop Res. 2000; 20(3):411-414.
6. Pradhan A, Thakur A, Patel S, Mishra N. Effects of different nitrogen levels on kodo millet (Paspalum

scrbiculatum L.) under rainfed conditions. *Res.* J Agril. Sci. 2011; 2(1):136-38.
7. Resmisa. [Revalorising Small Millets in Rainfed Regions of South Asia]. Supporting Millets in India. Policy Review and Suggestions for Action, 2012.
8. Singh RV, Tripathi SK, Singh RP. Effect of integrated nutrient management on productivity, nutrient uptake and economics of green gram *Vigna radiata* L. in custard apple-based agri-horti system under rain fed condition. Current Advances. Agril Sci. 2015; 7(1):76-78.