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A study on adoption of foxtail millet production technology by the farmers in North Karnataka

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Abstract

Foxtail millet (*Setaria italica* L.) is one of the oldest cultivated crop extensively grown in the arid and semi-arid regions. Foxtail millet well recognized as a short duration and drought tolerant crop. It also has tremendous scope in meeting nutritional security contains starch, protein, vitamins and minerals. The present study was conducted to know the adoption of foxtail millet production technology by the farmers in north Karnataka. The study was carried out in Gadag and Haveri district of North Karnataka, a sample of 120 farmers were purposively selected based on highest area under foxtail millet crop cultivation and interviewed with the help of structured pre-tested interview schedule. The data obtained was analyzed applying appropriate statistical procedure viz., mean, frequency and percentage. The results showed that 44.16 percent of the overall foxtail millet growers belonged to medium adoption level category, whereas, 29.16 and 26.66 percent were observed in low and high level of adoption categories, respectively.

Keywords: Foxtail millet, adoption, technology, north Karnataka

Introduction

Foxtail millet (*Setaria italica* L.) is one of the oldest cultivated crop is also called Italian millet and German millet, extensively grown in the arid and semi-arid regions of Asia, Africa as well as economically developed nations of the world. Foxtail millets well recognized as a short duration and drought tolerant crop. Foxtail millet currently grown majorly in Rajasthan, Andhra Pradesh, Karnataka, Tamil Nadu, Maharashtra, Uttar Pradesh and Bihar. In Karnataka district like Koppal, Haveri, Gadag and Bellary etc. In order to assess the perception of foxtail millet production technology by the farmers the present study designed to study perception of foxtail millet production technology by the farmers in North Karnataka.

Foxtail millet has tremendous scope in meeting nutritional security contains components like especially starch, protein, vitamins and minerals. Which is suitable for vegetarians and vegans looking to meet their protein needs. Vitamins, including niacin, thiamine, riboflavin, and vitamin B6, which play crucial roles in energy metabolism and overall well-being. Essential minerals like iron, magnesium, phosphorus, and calcium are abundant in foxtail millet, supporting various bodily functions such as oxygen transport, bone health, and energy production. Due to coarse nature of foxtail millet grains, the digestible portions constitute 79% and remaining indigestible parts of the grain contain relatively high level of fibre as well as anti-nutritional components.

Due to its nutritional composition, foxtail millet offers various health benefits, supporting cardiovascular health due to its fiber content and low saturated fat. Aiding in weight management and blood sugar regulation due to its complex carbohydrates and dietary fiber. Providing essential nutrients for overall well-being, including iron for preventing anaemia and B-vitamins for energy metabolism.

Materials and Methods

The study was “*Explorative*” research carried out in Haveri and Gadag district of Karnataka state during the year 2022- 23. In Haveri, shiggon and Ranebennur talukas wherein Gadag, Laxmeshwar and Gadag taluks were selected based on highest area under foxtail millet crop cultivation. A total of 7 villages from 4 taluks of Haveri and Gadag district to form a sample of 120 respondents. A pre-tested structured interview schedule was used to collect the data from the respondents by personal interview method. The data collected from respondents were tabulated and analyzed using appropriate statistical tools such as frequency, percentage, mean and standard deviation. The recommended production technology in foxtail millet cultivation were finalized after discussion with the specialists and referring the package of practices.

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Accordingly, 15 recommended production technologies such as time of sowing, seed rate, spacing, nutrient management etc., were studied. The adoption of the practices was tabulated by using frequency and percentage. Respondents were asked questions to know whether they have adopted each of recommended production technology in foxtail millet or not.

The answers elicited from the farmers were quantified by giving “1” score to adoption and “0” to non-adoption.

Results and Discussion

Extent of adoption of foxtail millet production technology

Table 1: Adoption of foxtail millet production technology

(n=120)

Sl. No.	Practices	Adoption	
		f	%
1	Soil i. Red Soil	104	86.66
	ii. Black soil	16	13.33
2	Land preparation i. 1-2 times ploughing before sowing	114	95.00
3	Variety		
	i. SIA-2644, DHFT-109-3	34	28.33
	ii. Other (Haal Navane)	86	71.66
4	Seed rate: 2 kg/acre	106	88.33
5	Spacing: 30 x 10 cm	74	61.66
6	Time of sowing: June-July	50	41.66
7	Application of organic manures i. FYM-2-4 tonne	65	54.16
	Apply FYM before 2-3 weeks of sowing		
8	Seed treatment: Carbendazim @ 2 g/kg	26	21.66
9	Application of chemical fertilizers (kg/acre) i. Total dose of recommended fertilizer- 12:6:6 NPK/acre	56	46.66
10	Weed control i. Manual weeding: 1 time hand weeding	81	67.50
11	Inter-cultivation Intercultivate the crop for 2 times		
	1 st – 15-20 days after sowing	104	86.66
	2 nd – 10-15 days after first intercultivation	81	67.50
12	Mixed cropping Foxtail + Red gram	63	52.50
	Foxtail + Green gram	38	31.66
	Foxtail + sesame	35	29.16
13	Plant protection measures Pest management a) Shoot fly (<i>Atherigona</i> spp.) i. Spraying of chloropyriphos 20 EC (2 ml/lit)	19	15.83
14	Disease Management a) Blast and brown leaf spot i. Spray of Mancozeb 75WP 2 g/liter	18	15.00
	b) Rust ii. Spray hexaconazole @ 1 ml or propiconazole @ 1 ml per liter of water		
	c) False smut i. Seed treatment with carboxin 37.5%+ thiram 37.5% WP	10	8.33
15	Harvesting i. Manual Harvesting	120	100.00
	Harvest when ear heads are dry using sickle by cutting the whole plant		

-Frequency, %-percentage

Soil

The extent of adoption of foxtail millet production technology presented in Table 1 shown that 86.66 percent of respondents in foxtail millet crop adopted in red soil and 13.33 percent in black soil. Foxtail millet is a crop well suited to red soil due to this high yielding with less nutrient consumption and also the area under red soil is more in this study area hence red soil adoption is high compared to black soil.

Land preparation

The results in Table 1 shows that 95.00 percent of respondents adopted 1-2 times ploughing before sowing. This process aids in the loosening and overturning of the soil,

enabling roots to develop deep into the earth. Moreover, the roots can respire more freely due to the improved aeration facilitated by the loosened soil.

Variety

When look into variety adoption in Table 1 out of hundred percent 28.33 percent of the foxtail growers adopted new varieties like (SIA-2644 & DHFT-109-3), while 71.66 percent of them adopted local variety (Haal Navane). Less awareness about improved varieties and non-availability of seeds at the time of sowing might be the reason for adoption of local variety.

Seed rate

The data presented in Table 1 indicated that 88.33 percent of the foxtail millet growers had adopted recommended seed rate @ 2 kg per acre. Growers may have observed higher yields and overall better crop performance when adhering to the recommended seed rate.

Spacing

Further in Table 1 show that 61.66 percent of the farmers had adopted recommended spacing. Proper spacing allows for better air circulation around plants, weed management, nutrient distribution, yield and reducing the risk of diseases and pests.

Sowing Time

The results show that 41.66 percent adopted sowing time were June and July for the foxtail millet crop. More than two fifth of the farmers sowing foxtail millet crop at the time of June-July due to rainfall which required for improved varieties and some local varieties and remaining farmers sowing at the time of Aug-Sept because of more rainfall that is not suited for some local varieties.

Application of organic manures

In Table 1 where application of organic manure found more than half (54.16%) of the foxtail millet growing farmers had adopted FYM at 2-4 tonnes per acre and applying FYM before 2-3 weeks of sowing. FYM is rich in essential nutrients like nitrogen (N), phosphorus (P), and potassium (K), along with other micronutrients. These nutrients are crucial for plant growth, and applying FYM replenishes the soil with these elements.

Seed treatment

With related to seed treatment in Table 1 showed that (21.66%) of the farmers had adopted seed treatment with carbendazim @ 2g/kg. Only about one-fifth of farmers had adopted seed treatment, this low adoption rate is a result of farmers lack of technical knowledge, lack of technical guidance and beliefs that seed treatment is a minor practice in foxtail millet cultivation, and the difficulty of the procedure.

Application of chemical fertilizers

In case of application of chemical fertilizers in Table showed that only 46.66 percent of the respondents had adopted application of recommended dose of chemical fertilizer @ 12:06:06 NPK per acre in foxtail millet crop. Farmers who have low fertile soil which are deficient in nutrients and to get better yield applying the recommended dose of fertilizer.

Weed control

In case of weed control in Table 1 indicated that 67.50 percent of the farmers practiced manual hand weeding. In case of weed management more than half percent of the foxtail millet farmers had adopted manual weeding because incidence of weed less in foxtail millet crop due to this they can removed by manually through hand weeding.

Inter-cultivation

The results in Table 1 depict that 86.66 percent of the farmers had adopted 1st inter-cultivation at 15-20 DAS and 67.50percent adopted 2nd inter-cultivation at 10-15 days after 1st inter-cultivation. The majority of farmers have adopted two-time inter-cultivation because they understand how important it is to keep the field free of weeds and stop moisture evaporation.

Mixed cropping

Regarding mixed cropping in Table 1 show that 52.50 percent of the farmers followed mixed cropping with red gram followed by 31.66 percent with green gram and 29.16 percent with sesame. Mixed cropping is an agricultural practice where two or more different types of crops are cultivated together in the same field. This practice can have several benefits, including maximizing land use, optimizing resource utilization, reducing pest and disease risks, fodder purpose and increasing overall yield stability.

Plant protection measures

In Table 1 there were 15.83 percent of the foxtail millet growers had adopted chemical for control of shoot fly with recommended chemicals. With respect to chemical control of shoot fly nearly only one fifth had adopted the chemical spraying of recommended pesticides because the incidence of pest is low in foxtail millet crop.

When look into the diseases control Table 1 showed that 15 percent, 12.50 percent and 08.33 percent foxtail millet growing farmers were adopted recommended fungicide to control brown leaf spot and blast, rust and smut, respectively. With respect to disease control the infestation of diseases are very less and less growers followed chemical control with recommended fungicides.

Harvesting

With regard to harvesting in Table 1 showed that cent percent of the farmers were manual harvesting, when ear heads are dry cut the whole plant with the help of sickle. After the crop maturity people harvest the crop by using sickle and there is non availability of combined harvester for this crop because the area under foxtail millet is less so mechanization is less.

Table 2: Distribution of foxtail millet growers according to overall adoption of recommended foxtail production technology

(n=120)

Sl. No.	Category	Frequency	Percentage
1.	Low (<10.29)	35	29.16
2.	Medium (10.29-13.65)	53	44.16
3.	High (>13.65)	32	26.66
	Mean=11.14		SD=3.00

Overall adoption of foxtail millet production technology

It could be inferred from the data in Table 2 that nearly two fifth 44.16 percent of the overall foxtail millet growers belonged to medium adoption level category, whereas, 29.16 and 26.66 percent were observed in low and high level of adoption categories, respectively.

The probable reason for the above findings could be that, those practices which are easy to adopt and required lesser skill are more adopted by foxtail millet growers. While, those practices, which required more knowledge and skills are adopted by a lesser number of foxtail growers.

Conclusion

The crop foxtail millet has a lot of potential for modern agriculture because it is hardy and adaptable. Its capacity to adopt to a variety of climatic conditions, short growing season, low water needs and lower incidence of pests and diseases make it a worthwhile option for areas dealing with environmental issues like salinity and drought. Foxtail millet crop also rich in nutrients, high in protein, fiber and other essential nutrients. Foxtail millet has a limited selection of improved varieties, so adequate research must be conducted

and develop improved varieties.

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