

Millets cultivation in Mizoram:

Status and future prospects

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Millets are small seeded cereals, rich in nutrients and possess great adaptability to biotic stresses, making them important source of human and animal foods, under changing climate scenario. Keeping in view the importance of millets, the year 2023 has been declared as the International Year of Millets (IYM) by FAO to spread awareness on millets, their cultivation practices and explore their vast potentiality. Climatic condition of India is very much suitable for production of millets, including the state of Mizoram. However, the cultivation of millets in Mizoram has been declining at present. Hence, to improve the millet productivity in the state, germplasm screening in terms of yield, quality, biotic and abiotic stresses need to be taken up along with identifying best-performing genotypes for mass cultivation. Moreover, Mizoram soils have huge potential to capture national and international markets through large-scale cultivation of organic millets.

Keywords: Jhum, Millets, Mizoram, Nutri-cereals

MILLETS, one of the earliest cultivated food crops, are a variety of small-seeded grains belonging to Poaceae family. They are native to many parts of the world but at present, are most commonly grown in dry climates of arid and semiarid tropics of India and African countries. India is the largest producer of millets worldwide with a value of 13.21 million tonnes followed by China with 2.7 million tonnes. India mainly produces Sorghum/Great Millet/Jowar (*Sorghum bicolor*), Pearl millet/Bajra (*Pennisetum glaucum*), Finger millet/Ragi (*Eleusine coracana*) and small millets such as Foxtail millet/Kangani/Kakun (*Setaria italica*), Little millet/Kutki (*Panicum sumatrense*), Kodo millet (*Paspalum scrobiculatum*), Proso millet/Cheena (*Panicum miliaceum*) and Barnyard millet/Sawa/Sanwa/Jhangora (*Echinochloa esculenta*). Additionally, the Central government in 2018, through the Ministry of Agriculture and Farmers Welfare has included pseudo millets, viz. Buckwheat/

Kuttu (*Fagopyrum esculentum*) and Amaranthus/Chaulai (*Amaranthus viridis*) along with the above-mentioned millets among nutri-cereals for production, consumption and trade.

Nutri-cereals

Millets are nutritionally superior to other cereals as they contain higher levels of essential amino acids, vitamins, dietary fibre, phytochemicals and minerals such as iron, magnesium, calcium, zinc, phosphorous and potassium. They were previously known

as coarse cereals and have now been rebranded as nutri-cereals to eradicate the notion that millets are inferior to cereals. Millets are acclaimed not only for their nutrient content but their tolerance to extreme weather conditions and drought resistance. They also display higher resistance to pests and diseases as compared to major cereals. Millets are grown worldwide and also offer a wide range of processed products depending on culture and region such as beverages, puffs, pastas, flakes, soups, flour, bread, poha, porridges, snacks, pulau, etc.

Table 1. Different types of millets cultivated across Northeast India

NEH state	Cultivated millets
Arunachal Pradesh	Finger millet, Pearl millet, Foxtail millet, Proso millet and other small millets
Assam	Foxtail millet, Barnyard millet and other small millets
Manipur	Foxtail millet and other small millets
Meghalaya	Finger millet, Pearl millet, Foxtail millet and other small millets
Mizoram	Sorghum, Pearl millet and other small millets
Nagaland	Sorghum, Pearl millet, Finger millet and other small millets
Sikkim	Finger millet and other small millets
Tripura	Sorghum, Foxtail millet

The importance and prospects of nutri-cereals in terms of their characteristics and ability to combat climate change, water scarcity and population pressure is undeniable. Millets and millet production are crucial and must be popularized due to their ability to provide livelihood security by boosting farmers' income, and guarantee global food and nutritional security. In the North-eastern hilly (NEH) region, millets are most popularly grown in Arunachal Pradesh, Nagaland, Sikkim, Meghalaya and Assam along with small-scale cultivations in other states.

Millets in Mizoram

Buhtun word is used to describe millets as a whole with the exception of sorghum which is known as Faisa or Faibar. Other millets are not documented to have separate local names. Millets have held a deep significance in the Mizo way of life long ago. Along with rice and maize, millets were the staple foods of the Mizo ancestors ever since their nomadic migrations. They were a crucial part of the traditional jhum mixed farming system and were cultivated with rice, maize and other crops. As in the traditional jhum system, millet cultivation did not include any management practices for nutrients, pests, diseases and water management. Millets were most commonly used as snacks in the state. Sorghum was especially popular, however, it has now been predominantly replaced by a larger seeded crop. Even so, current millet production in the state is dominated by sorghum, although area and production are comparatively meagre to the rest of India. Foxtail millet is the second

most commonly cultivated millet in Mizoram. In Siaha district, farmers prefer minor millets especially foxtail millet. Adlay millet or Job's tears, even though not included in the list of nutri-cereals, is commonly found in the state. Cultivation of other local traditional millets is hardly reported. The cultivation of millets in Mizoram as a whole, at present, has declined over the years due to various reasons which were reported by farmers in a survey held across Mizoram.

The experiment was conducted in Mizoram during 2019–20 to identify the best suitable millets under Mizoram condition. Three different types of millets, viz. pearl millet cv. PC 701, finger millet cv. VL Mandua 347 and proso millet were tested at ICAR Kolasib Research Farm and at farmer's field. The finding indicates that pearl millet cv. PC 701 performed best among the tested

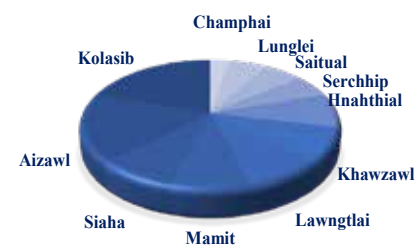


Performance of pearl millet crop in the experimental field

millets. However, for a final and conclusive result, more research work is required in Mizoram.

Opinion of Mizo farmers towards millet cultivation in Mizoram

A survey was conducted during 2022–23 from all 11 districts of Mizoram with a random sample size of 150 Mizo farmers to collect information about millets in Mizoram.



Selection of farmers from different districts of Mizoram

It was found that majority of the farmers no longer take up millet cultivation (48.57%) while 34.29% had not cultivated millets even in the past. Around 17.14% of the farmers currently cultivate sorghum while none are found cultivating other types of millet. Millet cultivation is and was concentrated 86.96% in jhum fields while some accounts, i.e. 8.70% in permanent farms and 4.34% in plains were also uncovered. It was found that millets were



Jhum field preparation for sowing



Mixed cropping with millets in jhum field

most commonly planted in mixed cropping system and only 8.70% farmers reported intercropping. The main crops grown in mixed cropping system with millets are rice, maize and ginger. In the plains, it was reported by only one farmer that sorghum was mixed with mustard, pumpkin, brinjal and so on. Millets upon harvesting are normally sundried, de-husked by hand and stored. None of the farmers interviewed, had any knowledge about the nutritional properties of millets and cultivated for the sole reason of consumption. Out of the farmers who had cultivated millets other than sorghum, 100% consumed it by boiling solely for snack purpose or with rice for main food while 25% used it to prepare fermented alcohol in the past.



Line sowing of millet crop by Mizo farmer



Sun drying of pearl millet panicle

It has been a common practice by 100% of present and past sorghum cultivators to consume popped cleaned and dried sorghum grains as a snack. It was also slightly processed by 19.57% of people by mixing with jaggery to make sweet sorghum balls. Traditional practice of millet cultivation as border crop near roadsides and on the periphery of the fields was reported by 47.83% of the millet cultivators. They were also planted as sole crop in contrast to the practices of the traditional jhum system, for easier harvesting as well as a mark of territory due to their lofty heights. Out of the 72 farmers who had cultivated millets in the past stated various reasons for discontinuing their cultivation such as preference of other crops such as rice and popcorn (76.09%), lack of marketing opportunities (19.56%) and unavailability of seeds (4.35%).

Prospects of millets cultivation in Mizoram

Mizoram is a state inhabited by farmers accustomed to mixed farming under very difficult hilly terrain with the least mechanization

options. This system broadens the mind of Mizo cultivators to a variety of crops which can include millets, if the essential spread of awareness is taken up by agriculture extension personnel of government and private agencies to farmers and consumers on millets and their numerous prospects. Millets, as stated frequently by many researchers, are an extremely nutritious group of cereals. These nutri-cereals have the potential to provide the required nutrients to the malnourished population of poor rural communities. Due to their climate resilience, adaptability to biotic stresses and lesser inputs requirement, they are convenient for cultivation. Millets are a group of sustainable crops and their cultivation is in line with the currently favoured organic farming system and is environmentally suitable in view of present-day climate change scenario. Another promising prospect in millets cultivation is that a great deal of previously mentioned value-added products are processed from the nutri-cereals and these commodities will help boost farmer income. In view of IYM and the ongoing

popularization of millets cultivation worldwide, the demand for fresh and processed millet products are on the rise extensively. This trend further increases the potential of export opportunities which will be tremendously beneficial. Millets cultivation will also be favourable not only to the food sector of Mizoram but also in its animal husbandry sector. Millets are used and widely grown as forage crops in many parts of the world, especially in developed countries and can provide sufficiently nutritious feed for livestock. Cultivation of millets in Mizoram has numerous potential to uplift the income and further livelihood of Mizo farmers.

SUMMARY

Millets are nutritionally rich, require least agronomic management, can be grown in low fertile soil and are resistant towards pests and diseases. These properties of millets are best suited for Mizoram for its cultivation on a large scale. As found by the survey, cultivation of millets in Mizoram is inadequate and lacking in millet production as compared to the national average. Several initiatives are currently taken up by the state government to popularize millet production on account of IYM. Many regions of the state are potential areas to popularize and increase millet production even on a large scale. IYM provides an excellent opportunity for the state to improve its millet output.

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Jai Kisan, Jai Vigyan

- A total of ₹ 788.33 crores have been sanctioned for opening six new agricultural colleges for eastern India under Central Agricultural University, Imphal, and a new Central Agricultural University in Meghalaya.
- For the establishment of two new agricultural research institutes in Asom and Jharkhand, a sum ₹ 100 crores is allocated.
- First academic session of the Rani Lakshmi Bai Central Agricultural University has been allocated for four new agricultural colleges in Ditiya and Jhansi.
- An Memorandum of Understanding was signed for transforming the Rajendra Central Agricultural University, Pusa, Samstipur, Bihar. A proposal of ₹ 400 crores is submitted in EFC.
- Post-Graduate Institute of Horticulture is being established in Amritsar, Punjab.
- Foundation stone of the Indian Institute of Agricultural Biotechnology is laid at Ranchi for promoting agricultural biotechnology.