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Superfood: Millets and Millet-Like Crop in Ladakh

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Nutrition is one of the basic aspect that is required by body for growth, development and overall health. These consist of two types i.e., marconutrients (carbohydrates, proteins, fats) and micronutrients (iron, calciumetc). India faces a "double burden of malnutrition," with both undernutrition (stunting, wasting) and overnutrition (obesity) remaining significant challenges. According to WHO, India contributes a third of the global burden of undernutrition. Nutrition is central to the achievement of the Sustainable Development Goals (SDGs) of the 2030 Agenda, and at least 12 of the 17 SDGs include indicators relevant for nutrition.

Comparision between cereals and millets

Cereals and millets are important indicator of carbohydrates that is the part of macronutrients. But millets are considered superior as they have higher proteins, healthy fibre, low fat, essential fatty acids and consist of numerous micronutrients. In addition to that it has low glycemic index ideal for controlling blood sugar level and naturally gluten free suitable for gluten intolerance. Therefore millets like Jowar, Bajra, Barnyard, Prosomillet and Fingermillet. Historians estimate that millets date back to Asia more than 4,000 years ago and that during the Middle Ages it started featuring as an important grain type. The year 2023 has been declared the "International Year of Millets" by United Nations on India's proposal, as India is largest producer of millets in the world and aims to become the global hub of millets.

Millets in Ladakh

In context to Ladakh, two important ignored millets, Foxtailmillet and Prosomillet, which has lost its importance in the region. Foxtail millet (Setaria italica), has a low water requirement and successful almost entirely to its short growing season. It matures in 65-70 days. Foxtail millet can be planted when it is too late to plant most other crops. It is drought – resistant, grows well on loamy or alluvial and clayey soils. Proso millet or common millet (Panicum miliaceum), is a relatively short-duration emergency or quick-season irrigated crop with low moisture requirements. Proso millet is well suited for many soil types and climate conditions.

Package of practices in Ladakh

Prosomillet in Ladakh locally known as *cha-cha* they are of two types cha-mar (red seed) and cha-kar (white seed) while Foxtail millet locally known as *tse-tse*. The millets are traditionally grown in some pockets of Leh district (sham valley) and Kargil district (Dharchiks, Grakhon. Minjee). People here grow millets traditionally where seeds are broadcasted in the field previously grown with barley/wheat. Seed sowing is also done by ploughing after broadcasting of seeds. Ploughing is done on a pair of dzo (a crossbred of cow and yak). Due to high germination value of these crops, the soil is early covered by the crop resulting in weed growth suppression as such weed control is not required in the said crops. The field is irrigated by artificial means with stream water diverted through channels. 10-12 irrigations are generally done throughout the life cycle of crop. Due to their hardy nature and

special climatic conditions, these crops are devoid of any major insect/pest attack and disease infestation. The crop matures in about 3 months and is harvested soon after around 80% of its foliage turns yellowish in colour and the grain contains minimum moisture content which is detected by thumb method. The crop is harvested manually by uprooting method. After harvesting, the head is cut with a knife from the stalk and let to dry in open sun for about 10 to 15 days. The stalk is collected and stacked on rooftops to feed the livestock in winter season. Threshing is done manually by beating of the dried heads on floor with a stick.

Benefits of millets in Ladakh

Ladakh has short cropping season of 6-7 months, likewise millets are of short duration (2-3 months) fits very well in this zone. In some areas (Sham valley) these are grown as double cropping as sowing of seeds of millets is done simultaneously with the harvesting (uprooting) of barley/wheat which is the main crop of the area. Being one of the quickest growing cover crops taking only 4-5 weeks from seeding to flowering thus suppresses weeds and prevents soil erosion due to intensive runoff. Since millets matures quickly, these escape early autumn frost injury. In addition to that being a hardy crop it does not require manure/compost as it can be grown after the harvesting of barley on the same field. Due to hardy nature of the crops and special climatic conditions, there is no report of disease infestation and pest attack.

Buckwheat: Pseudocereal

Although buckwheat (*Fagopyrum esculentum*) is not botanically classified as millet, it is often discussed alongside millets in high-altitude farming systems. It's a pseudocereal belonging to polygenance family, unlike true millets which belong to Poaceace family. Instead buckwheat is related to soreel, knotweed not a grass like cereals. This crop was home to whole region of Ladakh some 50 years ago slowly its declining farming make it vulnerable for extinction. In whole region farmers are mainly growing wheat and barley only. But owing its health benefits awareness and easily availability in the region farmers are growing buckwheat once again. It contains all essential amino acids, sulphur, iron and zinc. Agriculture department is providing them with seeds (local variety) encouraging them to grow the crop. Moreover they try to adopt villages where they can distribute the seeds as demonstration so that farmers without hesitation sow it easily. It is suitable in the region because it's a hardy crop does not require fertile soil and much tillage, in some villages of Ladakh (Sham) it is sown after harvesting of barley/wheat.

Package of practices

As mentioned earlier they are sown without tillage and manure after harvesting of wheat/barley as a second crop. But in some region where temperature is cold they are sown simultaneously with wheat/ barley. The seeds are broadcasted in the field, it is adapted to poor growing soil, one of the quickest growing green manure taking only 4-5 weeks from seeding to flowering. It is used to suppress weeds, helps in soil binding and improves soil texture. Crop is harvested by sickle , sun dried in open field for week and threshing is done by beating with stick. This is the most easiest crop grown in Ladakh some 50 years ago, slowly its geeting its importance back.

Conclusion

Keeping in view the nutritional quality of its grain and early maturity and suitability of the crop for marginal lands, there is a need to revive its cultivation and human consumption in Ladakh. Intervention through scientific cultivation and value addition of these millets will help in their revival. The people of land locked Ladakh are nutritionally deficient during winter months due to insufficient availability of fresh fruits and vegetables and other essential commodities. The case of anemia is prominent among the women folk. These problems can overcome with the utilization of highly nutritious crops like millets. The consumption of millet based foods will help in prevention of many lifestyle diseases such as cancer, diabetes, hypertension, obesity, etc. which have now become prominent in recent years in this remotest region of the world. Relatively low demanding crops and no report of any disease and pest attack these crops can be thus could be a promising candidate towards the organic farming.