TECHNOLOGY BRIEF

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AGRICULTURE FOR TOMORROW

PEARL MILLET

Pearl millet is a resilient and nutritious crop that is well-suited for arid and semi-arid regions. Pearl millet is highly nutritious and rich in protein, fiber, and essential minerals such as iron, zinc, and magnesium. It is gluten-free and has a low glycemic index, making it suitable for individuals with gluten intolerance or diabetes. Pearl millet is primarily grown for its grains, which are used as a staple food for humans. The grains can be ground into flour and used to make various food products such as porridge, bread, and traditional flatbreads such as roti and bhakri. In some regions, the stalks and leaves of pearl millet are also used as fodder for livestock.

Economic importance of pearl millet

Pearl millet provides 353 kcal of energy, 67.5 g of carbohydrate, 11 g of protein, 5.4 g of fat, and 12 g of fiber per 100 g of seed. It is also a good source of vitamins, bioactive compounds, amino acids, and micronutrients such as calcium, iron, iodine, and zinc. It is gluten-free and hence a good substitute for wheat, recommended for patients with diabetes and cancer. Malting pearl millet is used in the production of beer and other alcoholic beverages.

Here are some guidelines for seed production and crop management for pearl millet follow.

Crop requirements

Variety selection

Choose a high-yielding and disease-resistant variety suitable for your agro-climatic conditions. Consider traits such as drought tolerance and resistance to pests.

Climate and soil preparation

Pearl millet thrives in well-drained soils. It grows best from 20 to 28 °C. Very hot and dry weather conditions and extreme cold temperatures adversely affect seed setting and are generally not suitable for seed production.

Isolation

Because pearl millet is a highly cross-pollinated crop, the seed crop must be sufficiently isolated from the same or other contaminating crops. An isolation distance of 400 m is sufficient for quality seed production.

Crop cultivation and management

Planting

Plant pearl millet in rows with adequate spacing, as this helps in better growth and management. Seeds should be sown approximately 2 cm deep. As pearl millet tillers profusely, rows should be spaced 75-90 cm apart with 15-20 cm spacing between plants within the row. The required seed rate varies from 3 to 9 kg/ha depending on spacing.

Water management

Pearl millet is relatively drought-tolerant, but water stress during critical growth stages can affect yields. Provide irrigation if needed, especially during flowering and grain filling.

Fertilization

Pearl millet generally responds well to balanced fertilization with nitrogen, phosphorus, and potassium.

1. Nitrogen (N): 100 kg/ha in three splits:
    a. Basal dose at the time of sowing at 30 kg/ha
    b. First top dressing at 40 kg/ha 30-35 days after sowing
    c. Second topdressing at 30 kg/ha (1/3) at the time of booting/just before flowering. Urea is a better option for the topdressings.
2. Phosphorus (P_2O_5): Basal dose at 60 kg/ha
3. Potassium (K_2O): Basal dose at 40 kg/ha
4. Zinc (as $ZnSO_4$): Basal dose at 10-15 kg/ha in Zn-deficient soils

Weed control

Implement effective weed control measures, particularly during the initial stages of growth. Mulching can help conserve soil moisture and suppress weed growth.

Harvest, postharvest, and storage

Harvesting

Seed moisture content is a good indicator of the optimum time of harvest. It is advisable to allow moisture content to fall to 15% before harvest. Harvest pearl millet when the panicles have fully matured and the seeds have reached physiological maturity. Leave the harvested crop in the field for drying before threshing. Average seed yield varies from 1,000 to 1,500 kg/ha.

Threshing and cleaning

Thresh the harvested crop using appropriate methods to separate seeds from panicles. Clean the seeds thoroughly to remove debris and chaff. Store pearl millet seeds in cool and dry conditions to prevent mold and insect infestations. Use proper containers or bags to protect seeds during storage.

For details, please refer to the quality seed production manual (resade.biosaline.org/sites/default/files/2021-06/Quality_Seed Production Manual_RESADE.pdf).

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ICBA is an international not-for-profit applied agricultural research center with a unique focus on marginal environments where an estimated 1.7 billion people live. It identifies, tests, and introduces resource-efficient, climate-smart crops and technologies that are best suited to different regions affected by salinity, water scarcity, and drought, among other factors. Through its work, ICBA helps to create jobs and improve livelihoods, food security, and nutrition for some of the poorest rural communities around the world.

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