The Millet Project

Exploring Millets to Diversify Cereal Options in our Diet and the Environment

Millet is a drought-tolerant, gluten-free grain with a diverse nutrient profile. Despite this, it is not commonly grown or consumed in the United States, where corn, wheat, and rice dominate cereal grain production. "The Millet Project" (TMP) was initiated at the height of California's drought in 2015. The goal of the project is to investigate how different millet varieties grow in various microclimates in California and the effect of drought and semi-drought conditions on their yield. TMP participants also strive to convey the benefits of millet to farmers and consumers in order to diversify the human diet, and consequently, agriculture.

Objectives

1. Test cultivation on a small-scale of several millet varieties at different locations in California.
2. Build collaborative relationships with regional farmers and provide them with the best information about growing millets in their locations. This includes conducting a cost-benefit analysis of growing millets to measure its profitability per acre, allowing farmers to compare millet production against other crops.
3. Introduce millets to consumers and educate them about the many benefits of the grain through local millet exhibits and outreach events. Connect food producers with farmers and customers, encouraging them to use millet.

So, what are millets?

Millets are a grain family that is gluten-free, lower in carbohydrates, and higher in protein, fiber, and minerals than most other grains.

Millet varieties. Photo by Amrita Hazra.

Methods and Findings

Test small-scale cultivation of different millets

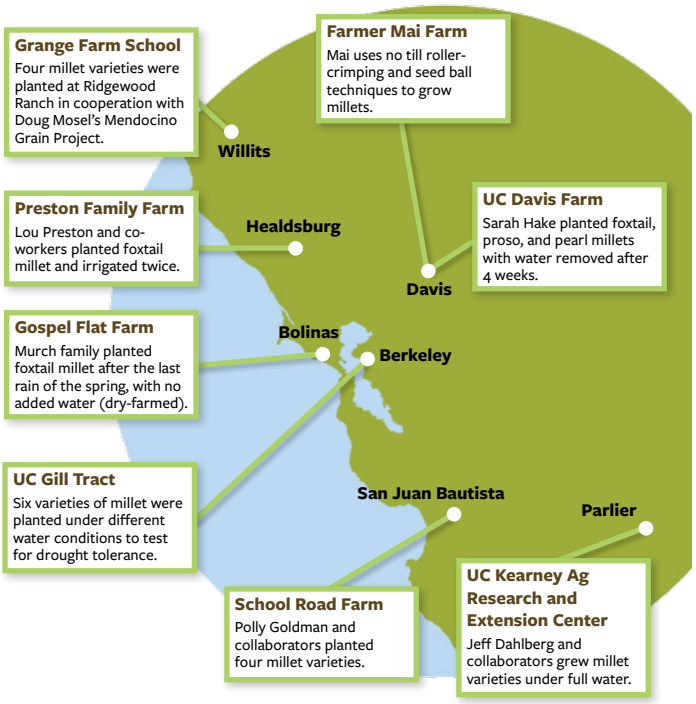
Alongside farmer-collaborators, the team tested the growth of different varieties of millets in different agroclimatic conditions in California. In the first year, three types of millets (Japanese, foxtail, and pearl) were tested, and in the second year, finger millet and two varieties of teff—also a millet—were added. TMP assisted farmers by providing planting guidelines. The TMP team tested the effect of three different field variables on the various millet varieties:

- watering regimes (irrigation, semi-irrigation, drought)
- soil conditions
- temperatures

At the end of the growing period, growth and yield of each millet variety were measured using:

- plant height
- number of millet heads
- length and weight of the seed heads

Numbers were correlated over two years, and a third year of planting is under way.



Map of project sites.

Collaborative partnerships with regional farmers

Through an annual exhibit, word of mouth, and media coverage of the project, several farmers and researchers in California, other states, and other countries are now interested in working with TMP to grow millets.

Altogether, the project worked with collaborators at eight sites in California to grow millet. In its third year, TMP will develop new collaborations across the United States and internationally. To encourage farmers to grow millets, the project also works to connect growers with local buyers, small businesses, and food manufacturers.

Outreach to Consumers

In 2015 and 2016, the Millet Project Exhibit introduced the team's efforts to the public. TMP invited the Bay Area community to the UC Gill Tract to see the millet varieties being grown first-hand, taste food made with millets, and take home millet seeds to grow and grain to cook. The Millet Project team has developed several new millet-based products with potential for viability in the consumer marketplace and has collected valuable feedback on the products using surveys. In addition to the Millet Exhibit, TMP members have presented the goals and successes of the project at several other venues and events, including Cal Day at UC Berkeley, the California Academy of Sciences, and Litquake in San Francisco. In the future, TMP members wish to carry out similar activities to popularize millets and millet-based food.

Conclusions and Implications

In a comparison of different millet types grown in three Northern California locations to test for drought tolerance, it appears that pearl millet is likely to be the most drought-tolerant. The Millet Project has garnered interest among farmers, including those curious about growing millets in California, as well as farmers outside the state who already grow millet and would like to collaborate. Public outreach events served not only to introduce consumers to millet, but also to gather feedback on millet-based products. This ongoing work will hopefully serve to popularize millet as both a nutritious food and a drought-resistant grain crop.

Research Team

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