

## Proso millet: cultivation, agronomic practices, and uses

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### Abstract

Millets comprise a number of small-grained, annual cereal grasses that include several different species, grown for food, feed, forage, and fuel. These crops are adapted to wide range of temperatures, moisture-regimes and input conditions supplying food and feed to millions of dryland farmers, particularly in the developing world. They are gaining importance in a world that is increasingly becoming more populous, malnourished and facing climatic uncertainties.

Proso millet (*Panicum miliaceum*) is a  $C_4$ , warm-season annual grass with large open-branching panicles. It has a short growing season ranging from 60 to 90 days after sowing, can grow successfully in poor soils and hot dry weather, but it can adapt to many soil and climatic conditions. It requires very little water, possibly the least of any cereal, and converts water very efficiently to dry matter and grain.

Major countries with substantial Proso millet production are India, China, Japan, Russia, Afghanistan, Iran, Iraq, Mongolia, Romania, and USA (Nebraska, South Dakota and Colorado). Although it is widely grown in the tropics and sub-tropics, its cultivation can extend to northern latitudes and to high elevations (up to 3,500 masl in India).

It is a highly nutritious cereal grain used for human consumption, bird seed, and/or ethanol production. As many of the other millets, proso millet is highly under researched, and the development of new varieties and associated agronomic practices could provide farmers options to diversify their systems.

The agronomic characteristics of proso millet, with attention to environmental requirements, role in crop rotations, and nutritional and health benefits will be presented and discussed in the paper.