

## What is the current state of QUINOA experimentation in the United States?

Most of the research on the growing of quinoa in the US has been done in Colorado because the altitude and climatic conditions most closely resemble the growing areas of the Andes where quinoa is presumed to have originated. Although the logic of growing the crop under similar conditions is clear, it limits the spread of quinoa as a crop of value to American farmers who do not farm in a dry, very high altitude region.

Colorado State University plant scientist Sarah Ward is one of several researchers who have pioneered development of varieties which thrive in irrigated plots at over 6,000 feet in the strong sunlight and cool nights of Colorado. White Mountain Farm in the San Luis Valley of Colorado situated at 7600 feet above sea level became the first large scale grower of quinoa in the US in 1987. They have maintained production and sell organic quinoa over the internet.

NASA scientists grew quinoa hydroponically to see if it would make a good crop for astronauts to grow in space (NASA TP 3422). This research is not directly relevant to the average Northeastern farmer.

Trials of quinoa in the upper Midwest indicated that high summer-time temperatures in that growing region warranted against the success of the crop there. The climate section of the Alternative Field Crop Manual (produced by the University of Wisconsin and University of Minnesota Extension Services) mentions the high temperature related failure of the trial crop in Rosemount, Minnesota.

The Northern Quinoa Corporation of Kamsack, Saskatchewan sells organic quinoa grown on the Canadian prairie and specifically credits the cool nights and sunny days of the northern Canadian location with the high quality of their product. The cool night time temperatures of the upland farming region of the Northeastern United States would seem to offer protection against the pollen damage associated with heat which inhibits the successful formation of quinoa seeds.

An ambitious project in 2002 by Norris Conant (FNE02-406) which was funded by NE SARE trialed 8 varieties of quinoa to see how they would do in the lower-altitude, wetter climate of Maine, but an atypical 95 degree heat wave and severe early season caterpillar damage left the results somewhat nebulous. The published final report did not calculate the yield for the named varieties, but did provide insights into management issues with quinoa, including time of planting, planting rate and weed control. The project also indicated that quinoa would grow in Maine even if we cannot conclude from this trial alone that it would make a successful field crop.

Several American seed companies sell named varieties of quinoa and anecdotal evidence suggests that gardeners in various parts of the US have grown and harvested quinoa for personal consumption. There is an on-going participatory quinoa breeding project funded by the Organic Farming Research Foundation, but this work is taking place in Washington State.

What is

# Quinoa?

Highly nutritious and palatable, quinoa (*Chenopodium quinoa*) is a grain (more properly a pseudocereal) which is gaining acceptance in the American marketplace.

Quinoa is a close relative of the familiar garden weed goosefoot (*Chenopodium alba*) which grows readily in the Northeastern United States. Because quinoa is gluten free, has a better protein to carbohydrate ratio than wheat, and has a remarkably balanced range of amino acids, it would make a healthy addition to the American diet. In 1993 NASA investigated quinoa as one of the most valuable foods which could be grown for long duration space travel because of its high protein content and remarkably balanced amino acid ratios (NASA Technical Paper 3422).

In the last decade quinoa has gained a reputation as a gluten-free, nutritionally valuable food which is delicious and easy to integrate into the American diet.

The resultant growth in demand has increased the retail price to as much as \$5 per pound. Almost all quinoa sold in the US is imported from the Andean countries Bolivia, Peru, and Chile. Finding an area of the US which could produce an organic local quinoa supply would improve the income of American farmers and increase the amount of quinoa available to the American consumer while at the same time reducing the economic pressure which is driving the price of a dietary staple beyond the means of many in the Andes (as detailed in a March 20, 2011 New York Times story).

Because the important American crops, corn, soybeans, and wheat dominate the best soil regions of the US, quinoa might prove to be an interesting alternative crop for those regions which are not well suited to such large-scale farming. Quinoa, much like buckwheat, requires cool night time temperatures to set viable seed. Since buckwheat is well adapted to many of the higher altitude farms of mountain Pennsylvania, the Southern Tier and Catskill areas of New York, the Berkshire region of Massachusetts, and the entire states of Vermont, New Hampshire and Maine, quinoa may grow in the same areas.

