

## About Amaranth and Quinoa

Both of these plants were among the super crops of the ancient Americans, along with corn and beans. Perhaps it was their association with pagan rituals, but these “grains” were outlawed by the Spanish conquistadors (on penalty of death) and almost lost to civilization. Both plants are strikingly beautiful, often with multicolored flowers, with large leaves and develop a seed head (up to 50cm long) at the plant’s top that resembles sorghum and is composed of thousands of tiny seeds. Both plants are hardy, require little water and can be successfully grown anywhere in the United States. Both use a special type of photosynthesis that is very efficient in bright sunlight, at high temperatures and under dry conditions. These are excellent plants for backyard grain growing because each plant produces a reasonable amount of grain and the threshing process is simple (rub the dried seed heads with gloved hands, gently winnow in front of a fan).

### Amaranth

There are many species of Amaranth, in fact the common invasive weed, “pigweed” is an amaranth, but three species are valuable as grains and several others are used worldwide as greens. We offer *cruentus* as our grain variety as it is the most adaptable of the amaranths and flowers over a variety of day lengths and produces a quite respectable amount of white seeds. *Cruentus* is also a very ancient variety – cultivated remains have been found that are over 5,500 years old. While its leaves can be used as a potherb, we have introduced a variety just for this purpose that yields a lot of leaf of better quality.

Amaranth grain has a nearly identical composition to wheat, with a slightly higher protein content (to 16%), with similar fat, starch, germ and bran content. It is very low in gluten, so it must be mixed with wheat for leavened bread. What the grain and the leaf also have in abundance are two of the three essential amino acids that the human body needs and which our bodies can neither manufacture nor do without: *lysine* and *methionine/cystine*. Vegetarian diets are often short in *lysine* because other grains are deficient in this and amaranth has a double helping, which makes it a great complement for all other grains – for example, combined with corn, wheat or rice it makes a nearly perfect protein match.

Leaf Amaranth is also very high in protein with similar composition. Generally the nutritive value is similar to other leafy vegetables, but its high level of dry matter effectively gives it 2-3 times the available nutrients of similar leafy vegetables. It is particularly high in Vitamin A, Iron, Calcium and Niacin.

Amaranth grain can be cooked and eaten by itself, with other foods, ground into a useful flour, popped like popcorn, added to soups, pilaf, porridge, dumplings, breads, pancakes, crepes, cookies, candies, toppings, fillers and beverages, among other uses. The whole grain cooked by itself has an earthy taste that soon disappears when butter or sugar is added.

Amaranth requires soil of good texture and tilth. Once established it requires little maintenance – it is a tall plant whose broad leaves tend to shut out weeds. It grows well in tropical Mexico and it grows well in the Himalayas. Amaranth is particularly promising for hot and dry conditions. One of the few real problems encountered are seed heads that grow too large and fall over, with the risk that ants or termites carry away the seed.

## Quinoa

Quinoa was the Mother Grain of the Incas. Like Amaranth there are many varieties, yet most are grown for both grain and leaves. Plants can be lightly harvested for leaves until the plants begin to mature and dry down. We offer several varieties that have done well in our garden in Willits and some have been successfully grown in Canada.

Quinoa is almost uniquely nutritious; it is claimed that quinoa comes as close as any vegetable or animal to providing all of the essential life-sustaining nutrients! First of all, it has a high protein content of 16% and is exceptionally high in the essential amino acids *lysine* and *methionine/cystine*, but these are just for openers. Quinoa has high quantities of all amino acids, and is nearly identical with soybeans and milk in the quality of its protein. Both the grain and leaves have high levels of Phosphorus, Calcium, Iron, Vitamin E and several of the B vitamins. Quinoa also has high oil and fat contents, enough to make it a viable oilseed. This exceptional balance between protein, oil and fat makes it uniquely valuable.

Quinoa does not like a lot of heat over 90 degrees, and the seed will not germinate in very warm soil (it must be refrigerated before planting) but it tolerates reasonable cold and will take some light frosts, especially if the ground is dry. Excessive water will kill it and it is extremely drought tolerant. It is subject to viruses common to spinach and beets, and some garden pests can attack it (flea beetles, aphids, leaf miners, and some caterpillars). Generally it does well in the garden, preferring good soil though it can thrive even in poor soils.

Bad News/Good News. Quinoa is naturally covered with a bitter tasting soapy substance called saponin. This coating must be washed away before quinoa can be eaten. This can easily be done in small quantities by putting it in a blender with cool water and running at slow speed. The water is replaced until it no longer foams (is soapy). For larger quantities, seed can be placed in a sealed cloth bag and run through a washing machine (without detergent), until the soapy coating is gone. The good news is that birds and insects do not like the coating either and so protects it against crop loss. It also protects the grain in storage and should not be removed until just before use. The seed will not germinate well once the saponin has been removed.

Quinoa has less flavor than other grains, being similar to soybeans in this respect. Our kids called it fisheyes and we generally try to combine it with other grains. It can also be added to soups or popped like popcorn and is brewed into a beer in Peru called chicha blanca.

Further Reading:

Amaranth: Modern Prospects for an Ancient Crop, 1984, Rodale Press book currently out of print but may be found in libraries or used book stores.

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