Quinoa

***Chenopodium quinoa* is a member of the Chenopodiaceae (goosefoot) family.**

Quinoa (pronounced keen´-wah or kwin-o´-uh) belongs to a genus of mostly weedy annuals. Plant heights of different varieties range from 42 to 72 inches. The plant has thick tops. Seed colors range from black to red, orange, yellow, and white. Leaf shapes vary with the variety. The grain must be processed to remove the seed coat, which contains saponin and may be toxic. Quinoa seeds, like millet seeds, are 1/16 inch in diameter and have two flat surfaces.

Varieties include Cahuil (cuyu), Faro (also Farro; light green foliage, yellow seeds), Linares No. 407 (green with some purple leaves, white-yellow seeds), Milahue, Temuco (yellow-green or a few golden heads, white seeds), D407 (early maturing, semi-dwarf growth habit, yellow compact heads, medium-small kernels), and Isleuga.

A quinoa planting at the University of California. (Photo: Tom Kearney)

Market Information

Current production and yield. Quinoa is a native American crop cultivated for centuries in the high Andes of Peru, Bolivia, and Chile. It was a staple food of the Incas. Primary production occurs in Chile and Peru. In its highest production, quinoa's yield equals that of wheat. The Faro variety performs well in Oregon; the Milahue variety is well-suited to California valleys. The Temuco variety grows well in Washington, California, and New Mexico. The variety Isleuga, a native of Chile, grows successfully in the United States. Several varieties have been grown in the Rocky Mountains, the interior Northwest, and the northern Pacific coast. In Colorado, researchers have obtained yields of 1,200 pounds per acre.

Recent interest in the crop is attributed to its versatility, growth requirements, and nutritional value.

Use. Quinoa can be used as a grain or as a flour. The related species *C. nutalliae* is grown as a vegetable in Mexico. Quinoa's taste has been compared to that of corn, squash, and couscous. It cooks like rice (4 parts liquid to 1 part quinoa) but in half the time, and is used in the same ways. Quinoa expands to 3 to 5 times its original volume, yielding 10 to 12 servings per pound. To toast quinoa, sauté the grain in a frying pan for 10 minutes and then boil in a double quantity of water for 10 to 15 minutes. Quinoa can also be curried, served as a side dish or a meat substitute, and added to salads, soups, breakfast porridges, and puddings. Its flour can be used in baked products, tortillas, and porridge.

Nutrition. Quinoa's composition is 10 to 15 percent protein, 4.5 percent fat, 63 percent carbohydrates, 4.1 percent fiber, 12.6 percent water, and 3.4 percent ash. It is rich in unsaturated oils and is a source of calcium, iron, and essential amino acids.

Culture

Climatic requirements. Quinoa can withstand light frost at 30° to 32°F. When the grain is at the soft dough stage (when the inside of a broken kernel will exhibit a soft starchy or cheesy texture), plants can withstand temperatures as low as 20°F. Temperatures over 95°F cause the vegetative plant to become dormant or lead to pollen sterility.

Propagation and care. Fruiting takes place during periods of short day length. In the Sacramento Valley, the time of sowing is mid-February through April. In Colorado, quinoa has been grown in elevations of 7,000 to 10,000 feet.

Allow distances of 1¼ to 2½ feet between rows for good production. As the distance between plants increases, more panicles are produced to compen-

ate for the smaller number of plants per acre. Plant at a depth of ½ to 1 inch, depending on soil type and moisture. Optimum density is 130,000 plants per acre (¼ to ½ pound of seed per acre).

Although soil preparation does not significantly affect yields, the vigor of the plant decreases with the minimum tillage systems. Seeds germinate within 24 hours and emerge within 3 to 5 days. In Colorado, maturity occurs at 90 to 125 days. By thinning to four plants per foot on the row, you can increase the yield by as much as 25 percent over fields grown without thinning.

Avoid over-irrigation, which causes severe stunting in seedlings. In Colorado, quinoa planted in late April to mid-May may not need irrigation until mid-June if the soil profile was near field capacity at planting. In California, irrigation is required since the crop grows mostly during the dry season.

Harvest and postharvest practices. The yields of plots harvested with self-propelled combine and cutter bar–thresher machinery are lower than those of manually cut fields. Windrowing and combining are not recommended practices to obtain high yields. Hand cutting the plants and laying them on paper to catch the seeds during drying is very effective. Low harvest efficiency and the small amount of seed required for planting will cause a severe problem with volunteers the following season.

Pest and weed problems. Weed control should begin 50 days after seeding. After this point, yields will decrease with each day control is delayed. Pests include flea beetles and many caterpillars. In Colorado, insect pests on quinoa include seedling-feeding, foilar-feeding, stalk- and petiole-tunneling, and seed-feeding insects. The plants are also susceptible to powdery mildew, which causes purple blotching of the leaves.

Sources

Seed

Abundant Life Seed Foundation, P.O. Box 772, Port Townsend, WA 98368

Hudson Seedsman, P.O. Box 1058, Redwood City, CA 94064

Living Tree Centre, P.O. Box 797, Bolinas, CA 94924

Peace Seeds, 2385 SE Thompson Street, Corvallis, OR 97333

Richters, Box 26, Goodwood, Ontario, L0C 1A0, Canada

Seeds Blüm, Idaho City Stage, Boise, ID 83706

More information

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Prepared by Tonya Nelson.