



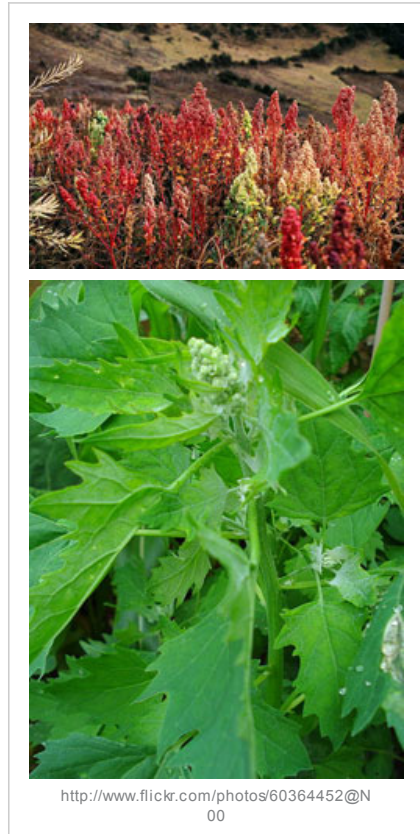
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Chenopodium quinoa - Willd.

Common Name	Quinoa
Family	Chenopodiaceae
Synonyms	
Known Hazards	<p> The leaves and seeds of all members of this genus are more or less edible. However, many of the species in this genus contain saponins, though usually in quantities too small to do any harm. Although toxic, saponins are poorly absorbed by the body and most pass straight through without any problem. They are also broken down to a large extent in the cooking process. Saponins are found in many foods, such as some beans. Saponins are much more toxic to some creatures, such as fish, and hunting tribes have traditionally put large quantities of them in streams, lakes etc in order to stupefy or kill the fish[K]. The plants also contain some oxalic acid, which in large quantities can lock up some of the nutrients in the food. However, even considering this, they are very nutritious vegetables in reasonable quantities. Cooking the plants will reduce their content of oxalic acid. People with a tendency to rheumatism, arthritis, gout, kidney stones or hyperacidity should take especial caution if including this plant in their diet since it can aggravate their condition[238].</p>
Habitats	The original habitat is obscure, the plant probably arose through cultivation[139].
Range	S. America - Western Andes.
Edibility Rating	
Medicinal Rating	





Summary

Physical Characteristics



Chenopodium quinoa is a ANNUAL growing to 1.5 m (5ft) by 0.3 m (1ft in). It is not frost tender. It is in flower from Jul to August, and the seeds ripen from Aug to September. The flowers are hermaphrodite (have both male and female organs) and are pollinated by Wind, self. The plant is self-fertile.

USDA hardiness zone : Coming soon

Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: acid, neutral and basic (alkaline) soils and can grow in very alkaline and saline soils.

It cannot grow in the shade. It prefers moist soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure.

Habitats

Cultivated Beds;

Edible Uses

Edible Parts: [Leaves](#); [Seed](#).

Edible Uses:

Seed - cooked[1, 2, 4, 27, 57, 97]. A pleasant mild flavour, the seed can absorb the flavour of other foods that are cooked with it and so it can be used in a wide variety of ways[K]. It should be thoroughly soaked and rinsed to remove a coating of saponins on the seed surface. The seed can be used in all the ways that rice is used, as a savoury or sweet dish. It can also be ground into a powder and used as a porridge[37, 183]. The seed can also be sprouted and used in salads[183] though many people find the sprouted seed unpleasant[K]. The seed contains a very high quality protein that is rich in the amino acids lysine, methionine and cystine, it has the same biological value as milk[196]. The seed contains about 38% carbohydrate, 19% protein, 5% fat, 5% sugar[171]. Leaves - raw or cooked[2, 4, 37, 57]. The young leaves are cooked like spinach[183]. It is best not to eat large quantities of the raw leaves, see the notes above on toxicity.

Medicinal Uses

Plants For A Future can not take any responsibility for any adverse effects from the use of plants. Always seek advice from a professional before using a plant medicinally.

None known

Other Uses

[Dye](#); [Repellent](#); [Soap](#).

Gold/green dyes can be obtained from the whole plant[168]. Saponins on the seed can be used as a bird and insect deterrent by spraying them on growing plants[141]. The saponins are obtained by saving the soak-water used when preparing the seed for eating. The spray remains effective for a few weeks or until washed off by rain[K].

Cultivation details

An easily grown plant, it requires a rich moist well-drained soil and a warm position if it is to do really well, but it also succeeds in less than optimum conditions[27, 37]. Tolerates a pH range from 6 to 8.5 and moderate soil salinity[196]. Plants are quite wind resistant[K]. Plants are drought tolerant once they are established[196]. Plants tolerate light frosts at any stage in their development except when flowering[57, 196]. Quinoa (pronounced keen-wa) is commonly cultivated as a grain crop in Chile and Peru[46, 57]. This plant is receiving considerable attention world-wide as a trouble-free easily grown seed crop for warm temperate and tropical zones. It has the potential to outcrop cereals on light land in Britain[141]. There are a great many named varieties[183, 196]. The plant is day-length sensitive and many varieties fail to flower properly away from equatorial regions, however those varieties coming from the south of its range in Chile are more likely to do well in Britain[196]. Different cultivars take from 90 - 220 days from seed sowing to harvest[196]. Yields as high as 5 tonnes per hectare have been recorded in the Andes, which compares favourably with wheat in that area[196]. Young plants look remarkably like the common garden weed fat hen (Chenopodium album). Be careful not to weed the seedlings out in error[K]. The seed is not attacked by birds because it has a coating of bitter tasting saponins[141, K]. These saponins are very easily removed by soaking the seed overnight and then thoroughly rinsing it until there is no sign of any soapiness in the water. The seed itself is very easy to harvest by hand on a small scale and is usually ripe in August. Cut down the plants when the first ripe seeds are falling easily from the flower head, lay out the stems on a sheet in a warm dry position for a few days and then simply beat the stems against a wall or some other surface, the seed will fall out easily if it is fully ripe and then merely requires winnowing to get rid of the chaff.

Propagation

Seed - sow April in situ. The seed can either be sown broadcast or in rows about 25cm apart, thinning the plants to about every 10cm. Germination is rapid, even in fairly dry conditions. Be careful not to weed out the seedlings because they look very similar to some common garden weeds[K].



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Expert comment

Author

Willd.

Botanical References

200

Links / References

[K] **Ken Fern** Notes from observations, tasting etc at Plants For A Future and on field trips.

[1]**F. Chittendon.** RHS Dictionary of Plants plus Supplement. 1956

Comprehensive listing of species and how to grow them. Somewhat outdated, it has been replaced in 1992 by a new dictionary (see [200]).

[2]**Hedrick. U. P.** Sturtevant's Edible Plants of the World.

Lots of entries, quite a lot of information in most entries and references.

[4]**Grieve.** A Modern Herbal.

Not so modern (1930's?) but lots of information, mainly temperate plants.

[27]**Vilmorin. A.** The Vegetable Garden.

A reprint of a nineteenth century classic, giving details of vegetable varieties. Not really that informative though.

[37]**Thompson. B.** The Gardener's Assistant.

Excellent general but extensive guide to gardening practices in the 19th century. A very good section on fruits and vegetables with many little known species.

[46]**Uphof. J. C. Th.** Dictionary of Economic Plants.

An excellent and very comprehensive guide but it only gives very short descriptions of the uses without any details of how to utilize the plants. Not for the casual reader.

[57]**Schery. R. W.** Plants for Man.

Fairly readable but not very comprehensive. Deals with plants from around the world.

[97]**Towle. M. A.** The Ethno-Botany of Pre-Columbian Peru.

A very interesting book covering quite a lot of information on plant uses in S. America although many of the plants are not suitable for temperate areas..

[139]? **Flora of Chile.** (in Spanish)

Some information about the useful plants of Chile.

[141]**Carruthers. S. P. (Editor)** Alternative Enterprises for Agriculture in the UK.

Some suggested alternative commercial crops for Britain. Readable. Produced by a University study group.

[168]**Grae. I.** Nature's Colors - Dyes from Plants.

A very good and readable book on dyeing.

[171]**Hill. A. F.** Economic Botany.

Not very comprehensive, but it is quite readable and goes into some a bit of detail about the plants it does cover.

[183]**Facciola. S.** Cornucopia - A Source Book of Edible Plants.

Excellent. Contains a very wide range of conventional and unconventional food plants (including tropical) and where they can be obtained (mainly N. American nurseries but also research institutes and a lot of other nurseries from around the world.

[196]**Popenoe. H. et al** Lost Crops of the Incas

An excellent book. Very readable, with lots of information and good pictures of some lesser known food plants of S. America.

Readers comment

Elizabeth H.

Abd Ellaif Awwad Sun Dec 9 2007

We try to plant quinoa in Egypt hop to workes & provied you by all details

greendesert-intr.org under costruction

Elizabeth H.

Ethan Descoteau Thu Mar 20 2008

[Salt Spring Seeds](#) a good rundown of basic quinoa and amaranth culture

Elizabeth H.

k gheewala Fri Nov 14 2008

we are a small co-operative village in Uganda we want to try and grow quinoa. please can you advise where we can obtain the seeds to grow quinoa? do we need the seeds with husks or can they be grown with the processed seeds. can you also give some idea of yield per hectar? thank you very much

Elizabeth H.

david n Fri Nov 14 2008

B & T World Seeds sell seeds of this plant internationally, you can purchase them via the internet(www.b-and-t-world-seed.com). I don't know the yield.

Elizabeth H.

Stephen Maxam Sat Nov 29 2008

Add an "s" to the word "seed" in the link above, i.e. www.b-and-t-world-seeds.com And, prepare yourself for the weirdest web page layout and programming ever.

Elizabeth H.

Robert Bucknall Mon Jan 12 2009

I am a farmer from Ontario, Canada. Is there anyone growing quinoa in my area and if not is it possible to grow it here.

Elizabeth H.

Ashley Wiese Fri Jan 15 2010

I am a broad acre farmer in the wheatbelt of Western Australia and successfully germinated some Quinoa last winter. I would like to try Faro Quinoa and need about 100kg. Could anyone please advise me where I can source seed in any quantity. Thankyou.

LilyD.

Nov 29 2010 12:00AM

well, this year I tried growing some quinoa in my garden. My latitude is 45deg, temperate climate, Italy. The seeds, of an unknown cultivar and bought from a french ebayer, germinated around mid april and flowered at the beginning of june. The temperature rose and during July peaked at 33C for 3-4 hours during the afternoon practically for the full month. It seems the plants fell in a kind of stasis and only during august 3/4 of the plants began producing white seeds while 1/4 of them failed to set seeds at all. I expect to harvest the seeds by the end of September and plant the best ones next year at March. This experiment says that I've

been lucky and I probably got a day-neutral cultivar, however its temperature sensitivity *seems* disappointing. so far I'm around 150 days of plant growth and the end of the cycle has not yet been reached. I also observe a great deal of variability, a few plants are probably mutant and *might* be able to adapt themselves to higher temperatures. One thing is sure, if you want to grow quinoa in temperate environments you need a day-neutral cultivar. The one I stumbled upon is, but producing white relatively large seeds it probably isn't a sea-level variety and thus shows temperature sensitivity. Through some research I found another cultivar in addition to faro and red faro which might work better in my climate, it's a chile variety called "regalona baer" it has already been tested in my country and is a pretty good producer tolerating our climate and latitude pretty well. I just need to import at least one Kg of such seeds. Of course nobody seems to sell it online. If purchasing well characterised cultivars proves impossible, I'll probably have to stick to the slow and painful process of adapting my present quinoa line to my climate on my own via artificial selection. *ouch*

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Subject : *Chenopodium quinoa*

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