

Varieties of Quince (*Cydonia Oblonga* Mill.) Grown In Uzbekistan and The Importance of Their Storage and Processing

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Annotation. Quince is a pome fruit with limited world consumption, as such very few data are available about its pre and postharvest characteristics. The harvest time lasts from mid September to the middle of October based on the different cultivars. Quince fruit show a climacteric respiratory pattern. The fruit can be stored at 0 or 2°C for two to six months and storage can be prolonged up to seven months by controlled atmo-sphere conditions of 2% O₂+ 3% CO₂ at 2°C. The formation of flesh browning is the most limiting factor in storage of quince fruit. In this paper, some characteristics of quince fruit are reviewed.

Keywords: Fruit characteristics, maturation, Quince fruit

INTRODUCTION.

Quince is considered a very old crop and came to Central Asia from Iran. After the 17th century, quince began to be cultivated in Europe and other countries. Wild species of quince can be found in Azerbaijan, Dagestan, Turkmenistan, Iran, quince is grown as a fruit tree in Central Asia, Caucasus, Crimea and other places. Today, a number of new varieties of beeswax have been cultivated and established. There is also a Japanese type of quince, and a common type is grown in Uzbekistan. Currently, 80% of the market for quince production in Uzbekistan is in the Fergana Valley [1].

About 600,000 tons of quince are harvested around the world every year, 22.5% of the harvest goes to Turkey, 20.8% to China, 13% to Uzbekistan and 1.7% to Ukraine. The total average yield is 10-12 t/ha, while the yield according to European standards is 30 t/ha.

As a result of seed propagation in Uzbekistan, there are two types of quince (*Cydonia oblonga* Mill.) and Japanese quince (*Chaenomeles Japonicf* Hinde). Common jaidari quince is common in culture. In the horticulture of Uzbekistan, it is mainly grown as a tree.

Quince is a wonderful fruit for making a variety of sweet and savory dishes. The fruits, when treated properly, will keep for several months as they are. For longer storage solutions they can be refrigerated or frozen. In this article, we'll be looking at how to store quince fruits so they are ready to use whenever you need them.

Quince fruit are consumed as processed food such as jelly or marmalade and as a fresh fruit in some European and in most of the Arabic and Asian countries. Unfortunately, knowledge on pre and postharvest characteristics of this fruit is very limited because of its limited consumption. In this paper, besides research on harvest criteria and storage conditions of quince fruit, some postharvest treatments are also reviewed [2].

THE MAIN PART

CLASSIFICATION OF QUINCE VARIETIES

(*Cydonia oblonga* Mill)

Variety AROMATNAYA

It was created at the Samarkand Scientific Experimental Station of the Research Institute of Horticulture, Viticulture and Winemaking named after Academician M. Mirzaev. Since 1986, it has been included in the State Register of the Kashkadarya region.

Authors: A.K. Pavlov, Yu.M. Mirzakhidov.

The average height of a quince tree is 2.7 m, the branches are wide. Quince seedlings begin to be collected in the fourth year after planting. Productivity 342.6 c/ha, maximum yield 398.4 c/ha.

The fruit is large, average weight - 181 g, apple-shaped, smooth, turns yellow when ripe. The taste rating of ripe fruits is 4.5 points.

Variety ABUNDANT

It was created at the Samarkand Scientific Experimental Station of the Research Institute of Horticulture, Viticulture and Winemaking named after Academician M. Mirzaev.

In 1959, it was included in the State Register of Bukhara, Navoi, Kashkadarya, Samarkand, Syrdarya regions, and in 1967 - the Republic [3].

Author: A.K. Pavlov.

The average height of a quince tree is 2.9 m, the branches are scattered, flat and rounded. Quince seedlings are harvested in the third year after planting. Productivity 69.5 c/ha, maximum yield 112.8 c/ha.

The fruit is barrel-shaped, slightly widened at the base, yellow in color. The average weight of the fruit is 198 g, the pulp is light yellow, dense, the taste is sour, medium-sweet, aromatic.

Variety CRIMEAN AROMATNAYA

Created in the Nikitin State Botanical Garden. Since 1986, it has been included in the State Register of the Khorezm region.

The average height of a quince tree is 2.6 m, the branches are round, and it begins to bear fruit in the third year. Productivity 152.9 c/ha, maximum yield 198.8 c/ha.

The fruit is round, wound-shaped, smooth, shiny, slightly pubescent. The fruits are golden yellow when ripe, the average fruit weight is 210 g. The pulp is pale yellow. The taste rating of fruits at the time of ripening is 5.0 points.

QUINCE musky variety

Local variety, medium sized tree. The fruit is large (235 g), round, slightly dense on top, golden yellow, slightly brown, pubescent. The pulp of the fruit is medium dense, juicy, soft, sweet and sour, aromatic, prone to universal use. They are harvested after 4-5 years, ripen in October, and are stored until February. Productivity 150-180 c/ha. The taste rating of fruits at the time of ripening is 5.0 points.

variety OTLICHNISA

Created in the Nikitin State Botanical Garden. Since 1986, it has been included in the State Register of the Fergana Region.

The height of the tree is on average 2.5 m, the branches are thick, and the quince begins to harvest in the fifth year after planting. Productivity 347.8 c/ha, highest yield 385 c/ha.

The fruit is large, average weight 261 g, the color of the fruit is light yellow, slightly pubescent. The taste rating of ripe fruits is 4.7 points.

SOVKHOZNAYA variety

It was created at the Scientific Research Institute of Horticulture, Viticulture and Winemaking named after Academician M. Mirzaev. Since 1959, it has been included in the State Register of Syrdarya, Tashkent and Jizzakh regions, since 1967.

Author: A.N. Alley.

The height of the quince tree is 3.6 m, the thickness of the branches is average, the tree begins to harvest in the third year after planting. The fruits ripen in the third ten days of September. Productivity 289.7 c/ha, maximum yield 391.1 c/ha.

The fruit is pear-shaped, the base is long, the color is yellow, the surface is smooth, medium-hairy, the average weight is 204 g, the taste rating of the fruit in a ripe state is 4.2 points [4].

Variety SAMARKAND LARGE FRUITED

It was created at the Samarkand Scientific Experimental Station of the Research Institute of Horticulture, Viticulture and Winemaking named after Academician M. Mirzaev.

Since 1959, it has been included in the State Register of Bukhara, Jizzakh, Kashkadarya, Samarkand, Navoi, Surkhandarya and Tashkent regions, and since 1973 - in the State Register of the Republic.

Author: A.N. Alley.

The height of the quince tree is 3.5 m, and it begins to harvest in the fifth year after planting. The fruits ripen in the first ten days of September. Productivity 116.1 c/ha, maximum yield 157.1 c/ha. The fruit is pear-shaped, greenish-yellow in color, medium-hairy, large. The average weight of a quince fruit is 273 g. The taste rating of ripe fruits is 4.7 points.

Ministry of Agriculture of the Republic of Uzbekistan. You can familiarize yourself with the 2022 list of the state register of agricultural crops recommended for planting in the territory of the Republic of Uzbekistan by the Agricultural Crops Testing Center in the table below.

Order order number (number required)	The name of the variety (sort of naming)	Serial number of the originator (number originator sorta)	Go ahead code (Code pages)	to the registry year of introduction ((Year included to the register))	Recommended planting areas (Regions recommended for sowing)
6001866	Fragrant	23	UZ	1986	5
6002052	Abundant	23	UZ	1959	1-13
7306571	Crimean aromatic	98	RU	1986	13
2008001	Mushk quince	7	UZ	2012	1-13
2019001	Olma quince	7	UZ	2021	1-13
6903010	An excellent pupil	98	RU	1986	12
6002137	Samarkand large-fruited	23	UZ	1959	1-13
6002161	Sovkhoznaya	7	UZ	1959	4, 10, 11

How To Pick Quince Fruit For Storing

Before you can store your quinces, first you need to know how to harvest them correctly so that they remain at their best:

- Firstly, ensure the fruits are completely ripe. They should have an even, golden coloration all over.
- Quince usually ripens in late fall and early winter, although this can vary depending on where you live and the variety you're growing.
- To pick the fruit, grasp it gently in your hand and twist, or simply use a pair of secateurs and snip the stem above the fruit. Try to avoid allowing the fruit to fall to the ground as this could bruise it.
- Gather any fallen fruits that are lying under the tree before you start picking. These fruits won't be suitable for long-term storage without being processed and frozen, as they will quite likely be damaged and deteriorate rapidly.
- If any of the fruits you have harvested are not completely dry, they must be allowed to dry before storing. You can do this by laying the quince out in a single layer on a sheet of newspaper. Don't use plastic sheeting for this as this can make them sweat. Ensure that none are touching each other and allow them to air dry [5].

Choosing The Best Quince Fruits For Storing

If you're not lucky enough to have your own quince trees then you can purchase them from a garden store or farmers market.

When selecting quince for long-term storage without processing (cutting up, refrigeration, freezing, or transforming into something else) then there are a few things you must check carefully first.

- Any fruits you select must be a rich lemony yellow color.
- The fruit must be perfect without any imperfections such as bruises, dents rotten areas, scratches, or moldy spots. These will quickly rot the spoiled fruit and will also start to rot other fruits around them.
- Choose large fruits, as smaller ones tend to be less pleasant to eat.

You don't need to throw away fruits that don't make the grade, simply wash and peel them, remove any damaged areas and the core and seeds, then chop them up and freeze them.

How To Store Quince Fruit At Home

There are a variety of ways to store quinces, from whole fresh ones through to processed frozen ones.

STORING FRESH QUINCES

If you want to store your quinces fresh the way they were when picked from the tree, first go through the selection process as described above. Quince can be stored in the same way that apples are, in single layers on newspaper in crates.

Or, as I have done very successfully, on large, square, cardboard egg cartons. As these allow you to stack the quinces to about four height because of the way the egg cartons are made, the protrusions that the quinces sit on allow air to circulate freely around them.

Don't stack them any higher than this, as the pressure on the lower quinces may damage them.

Wooden crates can be stacked as high as is safe to do so, providing that the quinces are not carrying any of the weight and there is good air circulation around them.

It's vital that you don't allow the quinces to touch each other, as if one goes bad, it will quickly infect the rest and the rot will spread.

The quinces must be kept in a cool, dry, dark place such as a root cellar, or basement. High humidity is OK, it can even be preferable to help prevent the fruits from drying out. Keep them out of sunlight.

In good conditions, quinces can last for around three months like this [6].

- Prepare the storage area by killing any bugs, molds, and bacteria. This can be done by spraying it with an enzymatic cleaner. Leave this on for at least 15 minutes then wipe down with a clean cloth and hot water.
- The space must have good ventilation that allows the air to circulate.
- The more constant the temperature, the better. It must stay below 59°F (15°C), but the cooler it is, the longer the fruits will last.

If you don't have a suitable cool, dark place to store your fresh quince, then you can keep some in the refrigerator in the fresh vegetable boxes at the bottom. The ideal temperature range is between 37°F and 41°F (3°C and 5°C).

Here the fruits will remain fresh for a long time without losing any of their juiciness.

- Only select fruits with no signs of damage.
- Wipe the fuzz off of each fruit carefully, ensuring you don't damage the skin.
- Wrap individual fruits in kitchen paper. This is breathable and won't hold moisture next to the skin.
- Place the fruits in the cold draw "crisp" section of the refrigerator.
- The cooler the refrigerator, the longer the fruits will last. On average at 39°F (4°C) they will last for around 70 days.

How To Freeze Quince Fruit

If you're not too worried about keeping your quince whole and would like to be able to store it for longer, then preparing it into appropriate-sized batches and freezing could be the perfect answer.

- Start preparing your fruits by giving them a good wash to remove any dirt and wipe dry to remove any remaining fuzz. The reason for doing this is that the fuzz is bitter and we don't want it to contaminate the prepared fruit.
- Now you have a couple of options. You can freeze the quince whole complete with skin, but it is still best to boil them briefly first, before freezing. Or you can peel and core the fruit and chop it into evenly sized chunks.
- You can either poach or stew the quince or freeze it raw.

- Flash freeze the quince by lining a tray with baking paper, spreading your quince out over it evenly in a single layer, and freezing overnight.
- Check the following morning that the quince is completely frozen then store in individual portion-sized bags or freezer-proof containers that are well sealed.
- Alternatively, you can make a sugar syrup, poach your quince until just tender. Once cool, add them to the syrup and store them in airtight mason jars in the freezer until required. This will help maintain their texture.
- Quince should last in the freezer like this for around 6 to 12 months.

CONCLUSION

Providing the world's population with quality agricultural and food products throughout the year is an urgent global problem. There are 9 varieties of quince included in the state register in Uzbekistan. Nowadays, it is necessary to increase the volume of cultivation, storage and processing of this fruit in order to fight against anemia among the population due to the presence of iron content in the food safety.

Quinces can be stored much in the same way as apples. In prime condition, they last for several months in a cool dark place when handled correctly.

Alternatively, they can be refrigerated or frozen to increase their longevity. As quince is usually used cooked, pre-cooking them slightly before freezing is also helpful.

My personal favorite method is to wash, dry, peel, and core my quince, stew them in lemon water along with the peel and pips so it all turns a lovely pink color.

Because of its limited consumption, quince fruit are less researched than other fruit. That is why the available data about ripening of quince is very limited. Further studies are necessary especially on pre-harvest cultural management to increase fruit quality, and enzymatic activities that may play a role in flesh browning and other preharvest or postharvest treatments to delay ripening.

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