

Sweet chestnut

There are four main species of chestnuts; the Japanese chestnut (*Castanea crenata*), the Chinese chestnut (*Castanea mollissima*), the American chestnut (*Castanea dentata*), and the European chestnut (*Castanea sativa*). There are a considerable number of cultivars each with specific characteristics.

The European chestnut, also named sweet chestnut, is a large growing tree reaching a height of 35 meters with a wide spreading canopy. It is a tree of great longevity. Beside the parish church of Totworth in Gloucestershire is a sweet chestnut tree, some may say it's more like a mini woodland than a tree as many of the branches have rooted and it is hard to see where the original trunk ends and the new trunks begin. The main trunk could be 1,100 years old making it one of the oldest trees in the country.

The sweet chestnut is a deciduous tree with tongue shaped leaves that grow to about 25cm long and have sharply pointed widely spaced teeth. The flowers appear in late spring or early summer with male and female flowers borne on every tree, however as the flowering times generally do not overlap one tree by itself won't have a crop of nuts, more than one type of tree is needed. They are mainly wind pollinated though bees also pollinate the flowers and chestnut honey is a speciality in certain regions of France & Italy. The nuts develop in spiky cases with between 1 – 3 glossy chestnuts in each. Mature nuts are ready to harvest in October.



Sweet chestnut cultivation

Sweet chestnuts thrive best on deep, sandy loams they will not flourish in wet heavy clay. Soil pH should be acidic, between 4.5 and 6.5. Chestnuts won't tolerate calcareous (limestone) soils. Though chestnuts respond well to organic matter they don't require a very fertile soil. They have traditionally been grown on hilly land that is unsuitable for other agricultural crops. The preference of chestnuts for lighter soil provides an opportunity to utilize land that is marginally productive. All species of chestnuts are very drought tolerant however, in order to grow well, bear consistent crops, and large-sized nuts, they need adequate moisture throughout the growing season. Chestnuts will grow over a broad climatic range but prefer a warm climate they are sensitive to late spring and early autumn frosts and warmth during flowering is essential for successful fertilisation. Before you choose and plant sweet chestnuts get advice for the tree cultivar best suited to your climate and soil.

Sweet chestnut for nuts

Chestnut trees have been grown in China, possibly since 4,000 BC, and they are still the largest producer and consumer of chestnuts in the world. The Romans were cultivating sweet chestnut as early as 35 BC and it is thought that Roman armies marched on a diet of sweet chestnut porridge. The Romans ranked chestnuts alongside the olive tree and the grapevine as plants important to civilization. It was more than likely the Romans who introduced sweet chestnuts to Britain. In the UK, southern England has the greatest abundance of sweet chestnuts and records show they have been grown in this part of the country since medieval times when they were ground into flour for winter foods and in addition farmers used them to feed livestock food. There are no sweet chestnuts grown commercially for their nuts in Britain today.

The sweet chestnut has long played an important part in the Mediterranean diet. In Southern Italy they were a staple food mentioned in the writings of Dioscorides, Homer & Pliny. In some areas, for example Tuscany's Lunigiana and Lucchesia, much of the economy revolved around the chestnut crop, which people gathered in the autumn and worked long hours to sort, process, package and sell. It was back breaking work and many farmers left the land for other work but there is still a chestnut industry, though reliance on chestnuts as a staple food has diminished.

The main areas of production in Italy are Piemonte in the north, Tuscany and Umbria in central Italy, and Campania and Calabria in the south. Italy is one of the principal exporters of fresh chestnuts, Spain too grows an important chestnut harvest especially in Andalusia where Pujerra seems to be the chestnut capital, with its own processing plant. This remote village's economy revolves around the chestnut harvest with whole families gathering together in the Autumn to harvest the crop that thrives on the hilly slopes and acidic soils.

France and Portugal also have thriving chestnut export industries, as well as Turkey and Greece. Most of the other European countries that grow chestnuts provide nuts for their local economy.

The American chestnut (*Castanea dentata*) was once one of the most common and important tree species in the Eastern United States. The heart of the range was the Appalachians, where in some areas it made up almost 100% of the forest, the cool, moist, temperate rainforest of the Smoky Mountains, provided the perfect conditions for the trees and the bountiful chestnut harvest provided an important carbohydrate food supply for both native people and early colonists as well as wild life including bear, deer and elk.

Early European settlers gathered chestnuts in the forests, as well as cultivated small groves, they traded the nuts with the stores for goods, who shipped them into the cities. Chestnuts were an important part of the mountain economy and an important food to feed the growing urban population as the country developed. They were also an important source of food for livestock, and hogs and cattle were fattened for the winter on the prolific crop.

In 1904, a bark fungus (*Cryphonectria parasitica*) on Chinese chestnut trees (*Castanea mollissima*) was brought from China into New York City and by 1912 every chestnut tree in the city had been killed. By the 1950's the entire population of American chestnuts from Maine to Georgia were obliterated. The chestnut blight was a gigantic ecological disaster in American history, over 30 million acres of chestnut forest were killed in 40 years! Much of this loss occurred during the Great Depression, so the impact on both the mountain people that ate chestnuts, and the animals that depended on them in the autumn, was doubly devastating. The chestnut blight drastically changed the eco system. Today The American Chestnut Foundation is restoring the American chestnut to its native habitat in the United States through an ongoing breeding programme.



Totworth chestnut



Andalucia



Chestnut blight, Ohio

Sweet chestnut for wood

Sweet chestnut is a functional hard, durable and beautiful wood with a variety of uses. Managing chestnut as coppice was developed in the south of England in the early 1800's to meet the demand for long, straight poles for hops. Coppicing occurs when a tree is felled and sprouts arise from the cut stump (known as a stool). This process can be carried out over and over again and is sustainable over several hundred years. Sweet chestnut re-sprouts readily from the stump and reaching diameters of two feet or more in 50 years. Coppice is an extremely sustainable management style, and there are some coppices which have been managed for 100's of years with no significant decline in growth.

Trees for hop poles were coppiced on a 8 - 10 year rotation. When demand for chestnut coppice for hop poles fell, due to the introduction of wire supports, a new market emerged, for chestnut fencing and coppicing still thrives in the south of England more likely now to be cut on a 12 - 16 year rotation. In France chestnut stakes from coppiced trees are used to support the vines in vineyards.

Sweet chestnut wood from larger trees is relatively light weight compared to other hard woods making it very suitable for cladding. The high tannin content makes it very durable and removes the use of dangerous chemical preservatives, in addition sweet chestnut is known to be a very stable timber, resulting in less movement, distortion or splitting. It has a similar golden colour to oak, but with stronger grain and occasional dark brown mineral streaks and will weather to a natural silver colour.

Sweet chestnut wood can also be used to make shingles for roofing, floorboards and a variety of furniture



chestnut coppice



sweet chestnut fencing



sweet chestnut cladding



sweet chestnut timber



sweet chestnut posts

Disease & pests

Chestnut blight

Chestnut blight is a fungal disease caused by *Cryphonectria parasitica*. In the UK the fungus is a notifiable pathogen as it can wreak havoc in its path as in North America in the early 20th century. The fungus was originally introduced from eastern Asia. Chestnut blight has also spread throughout continental Europe since it was first discovered in Italy in 1938. The parasitic fungus attacks the tree above ground through natural breaks in bark or artificial wounds like pruning, cankers form and spread all over eventually killing the tree. Young trees can die within a year older ones may take up to 30 years. European chestnut trees are more resistant than the American chestnut to the disease.

Ink diseases

Ink disease is a fungal disease that attacks the roots of chestnut trees. The roots cease to grow, crack and exude a sap which turns black due to the presence of tannins this leads to the death of upper shoots and eventually the crown. Chestnut trees are resistant to the disease in the growing season but susceptible during the winter months. The first record of the disease was in Portugal in 1838 and it has since been reported in many European countries including France, Spain, Italy and the UK.

Chestnut weevils

Chestnut weevils can be a serious problem. Adult weevils lay eggs in the kernels through tiny holes drilled in the shell. After the grubs hatch they eat tunnels through the nut kernel and emerge through an exit hole after the nut has dropped on the ground to over winter in the soil. The extent of crop damage can range from none to 100% of the crop. While the main damage is caused by feeding larvae, the adults also feed on nuts, and this provides a point of entry for fungus and yeast organisms. Once weevils are detected the strategy has to be to break the cycle and there are different methods that can be adopted.

Asian wasp

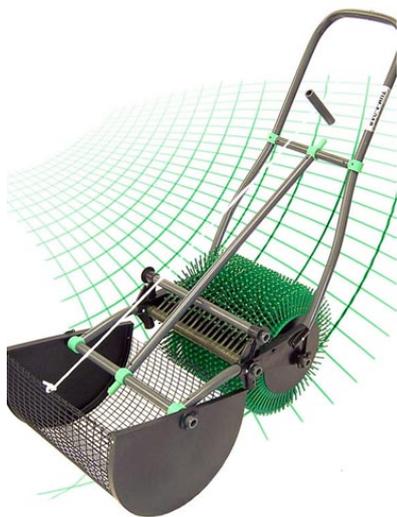
An Asian wasp threatens the UK's sweet chestnuts having been discovered for the first time in the UK in 2015 in Farningham woods near Sevenoaks in Kent. The Asian wasp larvae cause abnormal growth on sweet chestnut trees which weakens the tree leaving it more vulnerable to other pests and diseases.

Squirrels

Squirrels are well known for eating nuts and they do eat sweet chestnuts the spiny burs protect the nuts on the tree you just have to pick them up quicker than the squirrels when they fall to the ground. Squirrels may also strip the bark from the trees.

Harvesting nuts.

Chestnuts have been hand harvested in all of the major growing areas for over 2000 years. Chestnuts are not picked from the tree but picked up off the ground, where they fall when they are ripe. Traditionally this has been a family and community activity, potentially large areas and or lack of help may dictate the need for mechanically assisted harvesting options like a bag a nut machine, or a nut wizard. Large scale production could invest in a suction harvester as made in Italy by FACMA. The harvester sucks up the nuts and burs off the ground, separates them and places the nuts in bags.



baganut



nut wizard



suction harvester

After the chestnuts are harvested and any burrs removed they are washed in a water bath. If you have a weevil infection, the nuts must be soaked in hot water (122F) for 30 minutes and immediately cooled to 32-35F in a cooler. This kills weevil eggs before they hatch. Nuts with worms (young weevils) float to the surface and are removed and destroyed. They need to be cleaned of any dirt. The nuts will then need to be carefully dried until the shells are free from moisture.

To store the nuts need to be kept cool and not allowed to dry out. Because chestnuts are living seeds, if they dry out the embryo dies and the high levels of carbohydrate allow mold to infect the nuts. Commercial nuts are generally stored under refrigeration at 80% - 90% humidity and between a temperature of 28F - 30F as soon after harvest as possible. Traditionally in Europe they were stored in caves, or under chestnut leaves on the north side of a building in the shade. Alternatively the nuts can be dried to 10 – 15% moisture (worked out by weight) and stored peeled or in the shell, or dried to 7% moisture and ground into flour. Chestnuts can be dried in a warm dry place, by solar, in the oven or by dehydrator.

Chestnut nutrition

Chestnuts are unlike other nuts as they have a far higher carbohydrate content with a low content of protein and fat.

Chestnut contain approximately per 100g

45g carbohydrate

2.25g fat

2.50g protein

8g fibre

vitamins – particularly B complex and vitamin C

minerals – particularly copper and manganese

phytonutrients

source US Department of Agriculture – nutrient data base

The high carb content of chestnuts makes them comparable to other starch foods – potatoes, plantain, cereals. Traditionally chestnuts have been grown in areas unsuitable for arable crops to provide carbohydrate nourishment. The distinct composition has given rise to the nickname *the grain that grows on trees*, in France it is called *l'arbre a pain*, - *the tree of bread*. The high vitamin C content of chestnuts also sets them apart from other nuts.

In common with other nuts chestnuts provide many of the important B-complex groups of vitamins including niacin, pyridoxine, thiamin, and riboflavin. Chestnuts are a good source of folate a B vitamin that plays a role in preventing neurological defects in the fetus. The high vitamin C content of chestnuts sets them apart from other nuts.

In addition to vitamins nuts are an excellent source of minerals such as iron, calcium, magnesium, manganese, phosphorus, potassium and zinc.

Chestnuts are ~50% water when fresh, which makes them highly perishable, but store well once dried.

Food allergy concerns

It does appear that the prevalence of allergy to a variety of foods is increasing, there are now 14 foods that legally have to be listed as a potential allergens on all packeted foods and in catering outlets.

Nut allergies are very common and an allergic reaction to nuts can be severe and even life threatening. Most people who are allergic to one or more nut can safely tolerate others. In severe cases, all nuts need to be avoided because of possible cross-contamination.

In the UK chestnuts are the least common nut allergy with cobnuts and walnuts more common

Other uses for sweet chestnut

Bach flower remedies – sweet chestnuts

The sweet chestnut is a remedy for profound transition in the soul, the remedy helps us find a way and renews strength and hopeful.

Medicine

In some places an infusion of sweet chestnut leaves was used as a remedy for whooping cough and bronchitis.

Recipes

Traditionally chestnuts are eaten boiled, roast, preserved in sugar or turned into flour.

Roast chestnuts

Before roasting chestnuts, you must score them to allow steam to escape and prevent them from exploding like chestnut bombs while cooking. Take a sharp knife and cut an “X” into the flat side of each chestnut.

Place the chestnuts in a single layer in a pan with a lid and roast tossing over the embers of a hot fire for 10 – 15 minutes, alternatively place on a baking tray and cook in a hot oven 230C/450F/gas no 8 for 15 minutes.

Remove the chestnuts and allow to cool for 10 minutes, then whilst they are warm they are still warm remove the shells. The fuzzy inside skin will peel off along with the outer shell. Eat as they are or add to savoury dishes

How to make chestnut flour

Score the chestnuts and roast in the oven at 180C/350F/gas no 4 for around 30 minutes

Peel chestnuts and chop roughly

Return to the oven on a very low heat to dry them out completely

Blend into a flour in a food processor or pass through a flour mill

Store the flour in an airtight container in a cool dark place.

You could also make flour from nuts allowed to dry in a warm airy place for 6 weeks or a dehydrator but ensure the nut is dry before processing.

Chestnut soup

2 tablespoons olive oil

2 medium onions chopped

2 cloves garlic finely chopped

6 parsnips peeled and chopped

500 ml vegetable stock

500 ml milk (traditionally cows but oat milk works fine)

dessertspoon chopped thyme leaves

250g roast, peeled & chopped chestnuts.

Gently cook the onions and garlic in the olive oil, when soft tip in the parsnips and cook for a further 5 minutes. Add the stock, milk, thyme and chestnuts bring to the boil and simmer for 30 minutes. Blitz with a blender adding a little water if too thick, return to pan warm through, season as necessary with salt and pepper and ladle into bowls

Barley Pilaff with chestnuts and red onions

3 tablespoons olive oil

3 red onions finely sliced

1 carrot, finely chopped

2 sticks of celery finely sliced

225g barley

225g whole roasted chestnuts

zest of 1 lemon

1 tablespoon finely chopped thyme

600ml vegetable stock

Heat the oil with a little water and gently cook the red onion. Add the carrot and celery and cook for a further couple of minutes then add the barley. Stir well then add the chestnuts, lemon zest, thyme and vegetable stock. Stir, cover the pan tightly and cook over a low heat for 45 minutes or until the barley is tender and all the liquid is absorbed.

Chestnut, mushroom and apple bake

25g of butter
1 red onion, diced
100g shiitake mushrooms
1 tsp thyme
200g of chestnuts, boiled and peeled
2 Bramley apples
250ml of vegetable stock
100g of breadcrumbs
100g of butter
salt & black pepper

Preheat the oven to 180°C/gas mark 4

Heat a frying pan over a medium heat with 25g of the butter and cook the onions and mushrooms until softened but not coloured. Add the thyme and season with salt and pepper
Dice the apples and add with the chestnuts to the pan cook for a further 5 minutes then add the stock and bring to the boil
Melt the remaining butter and pour over the breadcrumbs, toss well then add the chestnut mixture
Butter a baking dish and tip in the mixture spreading and pressing into the dish.
Bake for about 40 minutes or until the top is crisp

Chestnut – honey cake

100g of honey, runny
4 large eggs, separated
40g of unsalted butter melted
75g of chestnut flour
25g of ground cob nuts
1 pinch of salt
½ teaspoon vanilla extract

Preheat the oven to 180°C/gas mark 4

1 loose bottomed 25cm cake tin buttered and lined with parchment paper

In a food mixer whisk the egg whites with the salt until soft peaks form, transfer to a clean bowl. In the same mixing bowl whisk the honey and egg yolks together until very light, thick and creamy.

Mix in the melted butter then fold in the ground cobnuts and chestnut flour and then gently fold in the egg whites.

Pour the batter into the prepared tin and bake for 35–40 minutes or until an inserted skewer comes out clean, cool slightly before turning out.

Tuscan Castagnaccio

250g chestnut flour
350 mls (approx) filtered water
pinch of salt
extra virgin olive oil
40g sultanas
50 ml sweet white wine or water warmed
30g chopped walnuts
1 dessertspoon very finely chopped rosemary

preheat oven 180°C/gas mark 4
shallow baking dish brushed with olive oil

Sieve the flour into a large mixing bowl to get rid of any lumps, then pour in the cold water bit by bit stirring till the mixture resembles a pourable batter. Stir in 2 tablespoons of olive oil.

Set aside for 30 minutes.

Soak the sultanas in warm wine/water for 20 minutes to plump up.

Add half of the chopped nuts, the plumped sultanas to the flour-batter mixture

Pour the batter into the prepared tin and sprinkle over the remaining nuts and rosemary. Drizzle a further tablespoon of olive oil over the cake.

Bake in the upper part of the oven for 40 minutes. During cooking the top of the cake will crack but this is quite normal. Remove and cool, eat warm possibly with a spoonful of cream cheese.

Chestnut pancakes (neccio)

9 oz chestnut flour
1 cup water
1 tablespoon olive oil + extra
soft fresh cheese (ricotta)
honey

In a large bowl, mix the flour with enough water to get a smooth, dense batter, slightly thicker than crepe batter. Add olive oil and a pinch of salt and mix again. Heat and lightly oil a frying pan. Add a couple of spoonfuls of the batter to the pan and tilt to evenly coat the pan

Cook for about 2 minutes or until you see that the top of the batter looks dry. Flip over and cook the other side for one minute. Keep warm whilst you make more. They can be eaten plain, as is, or try them rolled up with a spoonful of fresh cheese and honey.

Bibliography

How to grow your own nuts – Martin Crawford - Publisher Green Books 2016

Cultivars

Martin Crawford is the best person to give advice on tree cultivars and can be reached at mail@agroforestry.co.uk

Nurseries

Agroforestry Research Trust, 46 Hunters Moon, Dartington, Totnes, Devon, TQ9 6JT
+44 (0) 1803 840776 www.agroforestry.co.uk

Fruit & nut

The Sustainability Institute, Cooloughra, Ballinrobe Rd, Westport, Co Mayo Ireland
www.fruitandnut.ie +353 (0) 87 6714075

Tree Shop Ltd., Harts Barn, Monmouth Road, Longhope, GL17 0QD, UK
+44 (0)1452 832 100
www.tree-shop.co.uk

Sweet chestnut timber

<http://www.futuretrees.org/our-work/sweet-chestnut/current-research/>

sweet chestnut fencing
info@allgoodinthewood.co.uk

sweet chestnut cladding
studley@vastern.co.uk

sweet chestnut timber
sales@englishwoodlandstimber.co.uk

sweet chestnut posts
info@valleysawmill.co.uk

Resources

<https://www.agroforestry.co.uk/>

non profit making charity researching into temperate agroforestry and all aspects of plant cropping and uses

<https://www.permaculture.org.uk/>

helping to design thriving communities

<https://www.woodlandtrust.org.uk/plant-trees/large-scale-planting/>

grants, funding, tree pack give aways

www.treecouncil.org.uk/

grants, education, projects, campaigns

<https://www.nationalforest.org/get-involved>

grants for communities

<https://www.commonground.org.uk>

engaging people with their environment

<http://www.irishnutgrowers.ie/information.html>

promoting nut growing in Ireland

Nut harvesting equipment

www.baganut.com/

www.facma.it/

Dehydrator

Excalibur Excalibur <https://excaliburdehydrator.com/>

<https://www.ukjuicers.com/excalibur>

https://vegetarian.lovetoknow.com/Build_Your_Own_Food_Dehydrator

a great resource for building your own dehydrator

Solar dehydration

<http://www.youtube.com/watch?v=oVTcnCuX2Qc&sns=em>