

## Walnuts

The genus *Juglans* includes many different varieties of walnuts but the two most common varieties are the English walnut (*J regia*) and the black walnut (*J nigra*)

The English walnut is characterized by a thin, gnarled shell enclosing a smooth, ivory-colored nut. English walnuts have a mild taste and have been used for food for thousands of years. This kind of walnut came to England from Persia and is often referred to as the Persian walnut.

Black walnuts are characterized by a thick, hard shell with sharp, jagged edges and a darker color. The nuts have a pungent aroma and a stronger flavour than English walnuts. They are native to North America, specifically the Appalachian area and the Mississippi Valley.

The English walnut is a large deciduous spreading tree that can reach up to 30m high. Young bark is ash coloured changing to grey as it becomes older, leaves are light green with between 3 – 7 leaflets. They produce both male and female flowers but maturing at different times tend not to be self fertile. Green walnuts, produced in clusters of 1 – 3 are egg shaped and greyish green, as they mature the outer casing darkens and shrivels and the crinkly brown shell falls to the ground.

The black walnut is a large deciduous tree that can grow as high as 50m if the conditions are right. The tree has a brown almost black bark, with downy aromatic young branches. The leaves are 30 – 60cm long with between 15 – 20 leaflets. Black walnuts produce both male and female flowers but self pollination is unlikely. The green husked nuts either borne as 1 or 2 tend to fall to the ground when ripe intact with the nut inside.

Walnuts require a sunny sheltered position to thrive and whilst they succeed in most soils they prefer well-drained, fertile, moisture-retentive, alkaline loam, they will not grow well in compacted soil. Spring frosts can damage foliage and flowers. In the UK nut crops are unreliable too far north



***Juglans regia* walnut**



## Past & present

The first record of walnut cultivation dates back to Babylon circa 2000 BC, however archaeological excavation of Neolithic sites in France have found walnut shells suggesting they were eaten 8000 years ago. Selective breeding of walnuts is thought to have begun with the Ancient Greeks. The Greeks called walnuts *karyon*, or 'head', probably because the shell resembles the human skull and the kernel bears a resemblance to the brain. The Romans widely cultivated the walnut. The Romans thought walnuts looked more like testicles and consecrated the walnut tree to Jupiter, the king of the Roman gods, calling the nuts 'glands of Jupiter' This became condensed to *juglans* giving rise to the walnut's scientific name, *Juglans regia*, literally, 'royal nut of Jupiter'. Throughout Europe walnuts have played an important role in local economies. Regions like Perigord in France and Campania in Italy walnuts have long been part of the food culture. It was in Perigord that petrified roasted chestnut shells from the neolithic age were found.

Nowadays cultivation of walnuts takes place in many countries worldwide. In the UK much research and development has taken place over the last 20 years to improve the genetic quality of planting stock and promote the viability of growing walnuts both for the fruit and the wood.( DEFRA, Horticultural Research International East Malling, Northmoor Trust, National Forest Company, Agroforestry Research Trust, The Walnut Company)

## Jaguar Lount Wood at the National Forest

In 2001, sponsored by Jaguar cars, 72 hectares of walnuts began to be planted, at Lount in Leicestershire. This unique woodland is the largest area of walnut planted in the UK and is part of the National Forest which covers 200 square miles of the Midlands. The National Forest is a collaboration of individuals and organisations committed to creating community woodlands to be enjoyed by everyone. Scientists have set up three international research projects to study the trees. A significant link between Jaguar cars and walnut, of course, is the walnut veneer used in Jaguar cars.

## Walnut Wood

Both English and black walnut along with a wide range of cultivars can be grown for walnut wood. Black walnut is often considered the more suitable but it depends on the product as the grain, colour and finish depends on the variety.

English walnut has a varied grain pattern, often wild and swirly, with a soft brown colouring. Black walnut has quite a straight grain pattern and is chocolatey brown in colour.



**English walnut wood**  
[www.brookguitars.com](http://www.brookguitars.com)



**Black walnut wood**  
[www.britishhardwoods.co.uk](http://www.britishhardwoods.co.uk)

Walnut became popular for furniture making in the first part of the seventeenth century and trees were extensively cultivated. Its use declined somewhat after 1730 though it continued to be used in certain products. The English walnut in particular has long been used in gunstock. Today it is greatly valued for bespoke furniture design, musical instruments and veneers.

There are many furniture makers using walnut wood today, Peter Goodwin of Titchmarsh & Goodwin use UK sourced walnut for their furniture and Peter is involved in initiatives to ensure we maintain the health of Britain's woods for future generations.

Charles Thomson, British furniture designer, made the exquisite piece below from a 90 year old tree growing on a fruit farm in Kent.

With correct management there is potential for walnut trees to be grown for dual usage i.e. nuts and wood.



Walnut desk top tambour

### **Other uses of the walnut tree**

Many parts of the tree have medicinal properties, the leaves in particular are used in the treatment of skin fungal problems. Walnut leaf extract from *J regia* has been found to exert anti-cancer activity. Walnut Bach Flower Remedy is made from *J regia* 'Gives consistency and protection from outside influences' *Dr Edward Bach*

Weavers have long extracted a rich dark brown dye from walnut juice, and used the green husks to make a yellow dye to colour wool. Furniture makers and finishers use the husks to create a rich walnut stain and the walnut hulls have been used to make hair dye and ink.

Finely powdered walnut shells can be used in a wide range of natural skin scrubs, cleansers and creams. Crushed walnut shells are used to polish metal and glass as they act as an abrasive. The powder has been employed as a polish for metals used in the aeronautical industry

Crushed leaves can be used as an insect repellent as the leaves contain juglone which is insecticidal.

## Cultivars

Whether you plan to grow a walnut tree in the garden, plan a community orchard or cultivate walnuts on a farm it is essential you grow the right cultivar. There is no better place to start than with 'How to grow your own nuts' by Martin Crawford who gives clear and concise information about different cultivars; then with a little bit of knowledge meet up with him at the Agroforestry Research Trust, 46 Hunters Moon, Dartington, Totnes, Devon, TQ9 6JT +44 (0) 1803 840776 [mail@agroforestry.co.uk](mailto:mail@agroforestry.co.uk)

## Disease & pests

### Walnut leaf blotch (*ophiognomonia leptostyla*)

Caused by a fungus leaf blotch is present throughout Europe and N America on both *J regia* and *J nigra*. The fungus causes brown leaf spots and blotches and the leaves fall from the tree. The fungus also causes browning and shriveling of nuts. More likely in wet summers. choosing the right cultivar can help avoid leaf blotch.

### Walnut blight (*xanthomonas arboricola pv juglandis*)

The bacterium causes numerous small brown spots on the leaves and brown blotches may also occur on the fruit. The disease can be very damaging especially if cool wet weather occurs at flowering time. Resistant cultivars are available. *J nigra* rarely suffers from walnut leaf blotch.

### Honey fungus (*armillana.spp*)

*J regia* can be infected by honey fungus which is identified by a thin creamy layer of fungal mycellium covering the wood just beneath the bark. There are no real control methods and the only defense is to remove the diseased tree. *J nigra* is resistant.

### Blackline

This virus disease is transmitted through the use of infected tissue from grafts, by pollen and seed. Symptoms include a dark line between the stock and grafted tissue. poor growth and early leaf fall. As the disease progresses the tree suffers dieback and eventually death. Blackline affects *J nigra*

### Codling moth (*Laspeyresia pomonella*)

this moth can destroy the nut kernels early in the fruiting season and also stain both shell and kernel later. Pheromone traps to catch male moths are effective from early-mid Spring, otherwise encouraging moth consuming bats into your orchard may be a good strategy.

### Squirrels and birds

Grey squirrels will eat the nuts from your tree and also damage the trees by bark stripping  
If you want to grow nuts you will have to protect them from squirrels Martin Crawford in 'How to grow your own nuts' offers a number of suggestions

Harvest daily to prevent nuts sitting on the ground

Fruit cages made from wire

Electric netting

Creating a 1.5m boundary around nut trees.

Use of tree guards

Dogs running beneath the trees and potentially cats

Shooting

Cage trapping

Martin even suggest that the use of an artificial snake in trees can be effective for a short period.

Many of the above suggestions apply to birds with the addition of moving objects like flags and old cd's flapping in the wind

## **Harvesting nuts, drying and shelling walnuts.**

Before the age of mechanization, the traditional September harvesting of walnuts consisted of shaking the trees by hand using long hooked poles to knock the nuts to the ground where they could be easily gathered. Of course this is still quite possible but there is equipment that can make the process easier. Hand held harvesters like the nut wizard, push along harvesters or tractor scale commercial harvesters are all possible. It is possible to use a machine that shakes the trees whilst another machine uses vacuum suction to collect the fallen nuts.

Walnuts can be picked from the tree in June before the shell forms and turned into pickled green walnuts (this takes care of the squirrel problem!) Bennet Opie of Sittingbourne imports 200 tons of green walnuts from France, Italy & Bulgaria a year – so a potential market.

Nuts from the English walnut fall free of husks and are relatively easy to harvest the black walnut on the other hand falls still enclosed in the husk and will need to be removed. Nuts will then need sorting into sizes before drying. In past centuries, walnuts were simply left on drying racks until they were dried however some assistance will result in a much better product with greater keeping properties, Warm air and circulation is essential so either for a small number of walnuts use hand made wind tunnel or a dehydrator like the excalibur For larger quantities a homemade drying cupboard or a commercial hot air dehydrator can be used. Walnuts should be dried to between 12 – 15% moisture. Once dried the nuts can be stored in a cool dark place in airtight, moisture proof packaging for 3 – 6 months.

It is fine to crack with a simple hand cracker if you just have a walnuts from a tree in the garden but anything more is very likely to need either a hand cranked or electric machine – see resources

## **UK walnut growers**

Richard Dain of Hurst Wood Farm in Kent first planted walnuts in 2000. The walnut plantation extends to 14 acres and contains 780 trees with Lara and Broadview as the principal varieties

Alexander Hunt, who owns Potash Farm in Kent ( and is big in British nuts! ) runs The Walnut Tree Company and provides a very comprehensive advisory service to any farmer, community grower or private individual who is considering growing walnuts.

Edward Clifton Brown of West Bradley Orchards in Somerset started growing walnut trees over 15 years ago with wood in mind. Today he picks green walnuts (squirrel strategy) and pickles them.

Walnut plantations for nut harvesting take at least 5 years to reach fruiting. Trees for timber are more likely to take a life time. New orchard designs along with frost resistant and lateral fruit bearing varieties help make walnuts a more viable nut crop especially in the south of England.

## **Walnut nutrition**

Walnuts are an excellent source of anti-inflammatory omega-3 essential fatty acids, in the form of alpha-linolenic acid (ALA).

### ***walnuts contain approximately per 100g***

13g carbohydrate

65g fat

15g protein

7g fibre

vitamins – particularly vitamin E

minerals – in particular copper and manganese

phytonutrients

*source US Department of Agriculture – nutrient data base*

They are a good source of manganese, copper, molybdenum and the B vitamin biotin and also provide calcium, chromium, iron, magnesium, phosphorus, potassium, selenium, vanadium and zinc. In terms of phytonutrients, walnuts contain antioxidant and anti-inflammatory compounds, including more than a dozen phenolic acids, numerous tannins and a wide variety of flavonoids. The vitamin E composition of walnuts is good and it is in a particularly beneficial form. Instead of having most of its vitamin E present in the alpha-tocopherol form, walnuts provide an unusually high level of vitamin E in the form of gamma-tocopherol.

## **Brain Health**

Walnuts resemble the skull and brain and are the perfect example of what ancient herbalists called ‘the doctrine of signatures’ i.e. foods and herbs that resemble parts of the body can be used to treat ailments of that part of the body.

When Coles a seventeenth century herbalist examined the walnut he concluded that it had ‘the perfect Signature of the Head: The outer husk or green covering, represent the Pericranium, or outward skin of the skull’ The salt made from husks or barks, were ‘exceeding good’ for head wounds. Coles saw the kernel as having ‘the very figure of the Brain’ making it ‘very profitable for the Brain’

Whilst many ridiculed him nutrition science now confirms that walnuts do actually support a healthy brain function because of the nutrients they contain. Walnuts contain a number of neuroprotective compounds, including vitamin E, omega-3 fats, and antioxidants and research shows walnut consumption supports brain health.

One study has also shown that consuming high-antioxidant foods like walnuts can enhance cognitive and motor function in aging

## **Heart health**

Walnuts contain the amino acid l-arginine is found which offers benefits to people with heart disease, or those who have increased risk for heart disease

Walnuts also contain the plant-based omega-3 fat alpha-linolenic acid (ALA), which is anti-inflammatory and may prevent the formation of pathological blood clots.

Research shows that people who eat a diet high in ALA are less likely to have a fatal heart attack and have a nearly 50 percent lower risk of sudden cardiac death.

Eating just four walnuts a day has been shown to significantly raise blood levels of heart-healthy ALA and in another study eating just 25g of walnuts a day decreased cardiovascular risk.

Particularly in studies on the cardiovascular health of men, the gamma-tocopherol form of vitamin E found in walnuts seems to provide significant protection from heart problems.

### **Anti-oxidants**

Walnuts contain several unique and powerful antioxidants that are available in only a few commonly eaten foods. This includes the quinone, juglone, the tannin tellimagrandin, and the flavonol morin. Anti-oxidants are critical to good health and are part of what determines the way you age.

### **Cancer-Fighting Properties**

A recent study out of Marshall University school of Medicine in W Virginia suggests walnuts can inhibit the growth of breast cancer. Studies also demonstrate how including walnuts in the diet can reduce prostate cancer growth. It maybe that omega 3 and anti-oxidants give walnuts their tumour fighting potential. Recent research from the University of Connecticut showed that eating walnuts changed the gut microbiome and reduces colon cancer growth.

### **Male fertility**

One study showed that adding 75 grams of walnuts daily to the diet significantly improved sperm quality, including vitality, motility, and morphology.

Researchers are convinced about the nutritional benefits of walnuts especially when consumed in the whole form, including the skin. We now know that approximately 90% of the phenols in walnuts are found in the skin, including key phenolic acids, tannins, and flavonoids. Often removed because it is bitter the skin is nutritionally important so try to keep this phenol-rich portion.

### **Phytic acid**

Phytic acid is the principal storage form of phosphorus in many plants and found in all nuts, seeds and grains. The bound phosphorus is not readily bioavailable and in addition to the unavailability of phosphorous phytic acid readily binds with other minerals, such as calcium, magnesium, iron and zinc, making them unavailable as well. In this form, the compound is referred to as phytate.

The amount of phytic acid in any food is highly variable; the levels that researchers find when they analyse a specific food probably depends on growing conditions, harvesting techniques, processing methods, testing methods and even the age of the food being tested. Phytic acid will be much higher in foods grown using modern high-phosphate fertilizers than those grown in natural compost. Some nuts are particularly high in phytic acid like almonds where as some are relatively low like cobnuts.

Some people seem to be affected by phytic acid more than others. It is the enzyme phytase that neutralizes phytic acid and liberates the phosphorus. Research has shown that whilst some people have an intestinal microbiota able to degrade phytate thus releasing nutrients that the body needs others do not. Without enough phytase digestive disturbance can occur

### **Enzyme inhibitors**

Nuts also contain enzyme inhibitors which can stop digestive enzymes working. If we don't have enough digestive enzymes, we can't break down our food—which means even if we're eating well, we do not absorb all the nutrition.

Whilst phytates and enzyme inhibitors perform important tasks for the plant they can be detrimental to us so it helps to prepare our food in a way that limits potential problems to humans.

## **Soaking**

The phytic acid and enzyme inhibitors that can make nuts difficult to digest are neutralised by soaking in salt water and low temperature dehydrating.

Soaking in a salt solution and low-temperature dehydrating will break down most of the phytic acid. Soaking will neutralise many of the enzyme inhibitors and also increase the bioavailability of many nutrients, especially B-vitamins.

Many traditional cultures intuitively practiced preparations that deactivated anti nutrients and increased the bio-availibility of nutrients. Sally Fallon Morell from the Weston-Price Foundation in her book Nourishing Traditions is one of many people who advocate soaking nuts. According to her many traditional cultures used salty sea water to soak nuts and the sun to dry them. We can adapt this and use a good quality sea salt and water to soak the nuts, and an oven or a dehydrator at 120F/50C to dry them. The process of soaking and drying has disappeared in our modern food production systems but it is easy to incorporate in both family and larger scale production.

### ***How to soak and dry walnuts***

*Cover 600g of shelled walnuts with water and stir in one tablespoon of sea salt*

*Leave to soak at room temperature for 7 – 12 hours*

*Drain & rinse*

*You can use the nuts as they are – perfect for nut milks or salads.*

*If you want to keep them they will need drying.*

*Spread the nuts out on a baking tray.*

*Dry in a dehydrator or oven at 120 F/50C for 12+hrs or until crisp and dry.*

*You could also build a solar dehydrator to dry nuts.*

*Or you could build a drying shelf above a wood burner.*

Soaking and drying nuts is known as activating. It is a method used by the Aborigines for 1000's of years.

## **Nut allergy**

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.



## Walnut Oil

Unrefined walnut oil is made from nuts that are dried and then cold-pressed. Good quality walnut oil is golden brown in colour with a rich nutty taste.

Walnut oil has a limited shelf life, about 3 months. Once opened it should be kept in a cool place out of the light or refrigerated to prevent them from becoming rancid. Walnut oil has similar benefits to whole walnuts and works well with salads, splashed on vegetables or added to smoothies. You cannot heat walnut oil because of harming the poly unsaturated fats.

Walnuts grown on a small scale can be processed into oil as and when needed, ensuring a fresh product. Oil should be stored in small dark bottles.

Walnut oil meal left after extraction is 20% protein and 10% fat, it can be added to smoothies, used to make dips or added to chicken feed. The meal will go rancid quickly so must be stored in a fridge or freezer.

There are several different size cold oil presses available but it is worth investing in a machine that is robust. - see resources



## Recipes

Walnuts have a long culinary history. Green walnuts, completely edible but rather sour, have been turned into pickles, jams, and marmalades. During the eighteenth and nineteenth centuries, there were many recipes in Britain for pickling green walnuts.

### To pickle walnuts black

You must take large full grown nuts at their full growth before they are hard, lay them in salt & water, let them lie 2 days longer, then shift them into fresh water, let them lie two days longer then shift them again, and let them lie three in your pickling jar. When the jar is half full put in a large onion stuck with cloves. To a hundred of walnuts put in half a pint of mustard seed a quarter of an ounce of mace, half an ounce of black pepper, half an ounce of all spice, six bay leaves and a stick of horse radish then fill your jar by pour boiling vinegar over them. Cover with a plate and when they are cold, tie them down with a bladder and leather and they will be fit to eat in about two or three months

The Art of Cooking Made Plain and Easy

Hannah Glasse 1805

In the Middle East, a sweet syrup is used to preserve half-ripe walnuts, a process that takes several weeks before the sweetmeats are ready to eat. In Italy, walnuts are sometimes added to the pine nuts in the preparation of pesto, and the French enjoy walnut soup and sauces made of walnuts, garlic and oil. A very special old tradition in Italy is nocino a spicy sweet walnut liqueur.

The ancient Persians made a paste of ground walnuts and used it to thicken soups and stews, a technique that spread to Europe in the middle ages. The Narragansett Indians of the Eastern United States pounded the abundant black walnut into a paste to thicken their soups and vegetable stews.

Whilst walnuts have long appeared in baked goods both savoury and sweet to maximise the nutritional benefit they are best eaten raw they make an exceptionally good snack!

### Walnut & beetroot houmus

300g peeled beetroot in cm cubes

1 tablespoon olive oil

1 teaspoon ground cumin

good splash tamari and a pinch of salt

50g walnut meal (this is the product left after oil extraction)

50g walnut pieces

2 tablespoons tahini

1 clove garlic finely diced

juice and zest of half a lemon

salt and black pepper

oven 200C/400F/gas no 6

Toss the beetroot in the olive oil with the cumin, tamari and salt. Place in a lidded oven proof dish and bake in the oven for 40 mins, remove and cool.

Blitz the whole walnuts in a food processor until fine then add the meal, beetroot, tahini, garlic, lemon juice, a little salt and a good grind of pepper and blend until creamy, adding a little water if necessary.

### **Walnut & rocket pesto**

100 g walnuts.  
2 spring onions  
2 large cloves garlic  
100 g rocket  
6 tablespoons walnut oil  
3 tablespoons olive oil  
½ teaspoon chilli pepper  
salt and black pepper

Put the walnuts, spring onions, garlic and rocket in a food processor and process until finely chopped. Keeping the motor running slowly pour in the oils. Season the pesto with salt and pepper.

### **Brussel sprouts with apple walnuts and maple**

250g Brussels sprouts, trimmed and very finely sliced  
2 eating apples cored and diced  
100g walnuts roughly chopped  
2 tablespoons maple syrup  
juice of a lemon  
1 tablespoon tamari  
good twist of black pepper

Place brussel sprouts, apple and walnuts in a bowl and toss well  
Whisk the remaining ingredients together and pour over the sprout mixture.  
Gently massage with your hands and leave to stand for an hour before serving.

### **Nocino**

30 green English walnuts still soft enough to easily cut in half with a knife  
2 cinnamon sticks  
5 whole cloves  
1-inch piece of vanilla bean  
zest of one lemon  
300g sugar  
1 liter vodka

With a sharp knife cut the walnuts into quarters

Place the walnuts, spices, zest, sugar, and vodka into a large glass container, making sure the vodka totally covers the walnuts, fix a lid and shake well. Store for 6 weeks, shaking daily. (not the end of the world if you miss a day) the nocino will become darker and darker.

When you are ready to bottle carefully strain the solids out through a sieve. Strain the liquid through cheesecloth then pour into glass bottles and cork leave to mellow in a cool dark place for an absolute minimum of six months but will mellow beautifully over 2 years.

## References

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### walnut wood information

<https://www.nationalforest.org/>

<http://www.charlesthomson.co.uk/>

### medicinal

<https://www.healingherbs.co.uk/bach-essences/second-nineteen/walnut/#.V8GMeldlneR>

### Green walnuts

Bennet Opie  
Chalkwell Road  
Sittingbourne  
ME10 2LE  
01795 476154

<https://www.opiefoods.com/>

### Bibliography

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Nourishing Traditions - Sally Fallon with Mary G Enig Pub New Trends

How to grow your own nuts – Martin Crawford. Pub Green Books

Six Steps back to the Land – Colin Tudge Pub UIT Cambridge 2016

## **Oil extraction**

Make your own oil press

[https://www.davehakkens.nl/work/wind\\_oil/](https://www.davehakkens.nl/work/wind_oil/)

Alternatively it is possible to buy machines and you can find a good one on

<https://www.photomagnets.com/hand-crank-nut-seed-oil-press.html>

more about oil extraction

[https://www.youtube.com/watch?v=4bfkb\\_FOn3w](https://www.youtube.com/watch?v=4bfkb_FOn3w)

## **Dehydrator**

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

[https://vegetarian.lovetoknow.com/Build\\_Your\\_Own\\_Food\\_Dehydrator](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=oVTenCuX2Qc&sns=em>

## **Nut harvesting equipment**

<https://baganut.com/>

<https://www.facma.it/>

## **Resources**

[www.agroforestry.co.uk/](http://www.agroforestry.co.uk/)

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

[www.permaculture.org.uk/](http://www.permaculture.org.uk/)

*helping to design thriving communities*

[www.tree-shop.co.uk/](http://www.tree-shop.co.uk/)

*online native nursery downloadable brochure*

## **Nurseries**

**Agroforestry Research Trust**, 46 Hunters Moon, Dartington, Totnes, Devon, TQ9 6JT

+44 (0) 1803 840776 [www.agroforestry.co.uk](http://www.agroforestry.co.uk)

## **Fruit & nut**

The Sustainability Institute, Cooloughra, Ballinrobe Rd, Westport, Co Mayo Ireland

[www.fruitandnut.ie/](http://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/](http://www.tree-shop.co.uk/)

## **Advice on buying and growing walnuts**

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Richard Dain, Hurst Wood Farm 01732 885050