= Blackcurrant =

The blackcurrant (Ribes nigrum) is a woody shrub in the family Grossulariaceae grown for its piquant berries . It is native to temperate parts of central and northern Europe and northern Asia where it prefers damp fertile soils and is widely cultivated both commercially and domestically . It is winter hardy but cold weather at flowering time during the spring reduces the size of the crop . Bunches of small , glossy black fruit develop along the stems in the summer and can be harvested by hand or by machine . The fruit is rich in vitamin C , various other nutrients , phytochemicals and antioxidants . Blackcurrants can be eaten raw but are usually cooked in a variety of sweet or savoury dishes . They are used to make jams , jellies and syrups and are grown commercially for the juice market . The fruit is also used in the preparation of alcoholic beverages and both fruit and foliage have uses in traditional medicine and the preparation of dyes .

As a crop , the blackcurrant suffers from several pests and diseases . The most serious disease is reversion , caused by a virus transmitted by the blackcurrant gall mite . Another is white pine blister rust which alternates between two unrelated hosts , one in the genus Ribes (blackcurrant included) and the other a white pine . This fungus caused damage to forests when the fruit was first introduced into North America , where the native white pines have no genetic resistance to the disease . As a result , the blackcurrant has for most of the 20th century been subject to restrictions in parts of the United States as a disease vector . The effectiveness of these restrictions is questionable , since other Ribes species also host the disease and are native to North America .

Breeding is being undertaken in Europe and New Zealand to produce fruit with better eating qualities and bushes with greater hardiness and disease resistance .

= = Description = =

Ribes nigrum , the blackcurrant , is a medium @-@ sized shrub , growing to 1 @.@ 5 metres (4 @.@ 9 ft) by 1 @.@ 5 metres (4 @.@ 9 ft) . The leaves are alternate , simple , 3 to 5 cm (1 @.@ 2 to 2 @.@ 0 in) broad and long with five palmate lobes and a serrated margin . All parts of the plant are strongly aromatic . The flowers are produced in racemes known as " strigs " up to 8 cm (3 in) long containing ten to twenty flowers , each about 8 mm (0 @.@ 3 in) in diameter . Each flower has a hairy calyx with yellow glands , the five lobes of which are longer than the inconspicuous petals . There are five stamens surrounding the stigma and style and two fused carpels . The flowers open in succession from the base of the strig and are mostly insect pollinated , but some pollen is distributed by the wind . A pollen grain landing on a stigma will germinate and send a slender pollen tube down the style to the ovule . In warm weather this takes about 48 hours but in cold weather it may take a week , and by that time , the ovule may have passed the stage where it is receptive . If fewer than about 35 ovules are fertilised , the fruit may not be able to develop and will fall prematurely . Frost can damage both unopened and open flowers when the temperature falls below -1.9 ° C (28 @.@ 5 ° F) . The flowers at the base of the strig are more protected by the foliage and are less likely to be damaged .

In midsummer the strigs of green fruit ripen to edible berries , very dark purple in colour , almost black , with glossy skins and persistent calyxes at the apex , each containing many seeds . An established bush can produce about 4 @.@ 5 kilograms (10 pounds) of fruit each year .

Plants from Northern Asia are sometimes distinguished as a separate variety , Ribes nigrum var. sibiricum , of which Ribes cyathiforme is considered a synonym .

= = Cultivation = =

= = = Site selection and planting = = =

Blackcurrants can grow well on sandy or heavy loams , or forest soils , as long as their nutrient requirements are met . They prefer damp , fertile but not waterlogged ground and are intolerant of

drought . Although the bushes are winter hardy , frosts during the flowering period may adversely affect the yield and cold winds may restrict the number of flying insects visiting and pollinating the flowers . A pH of about 6 is ideal for blackcurrants and the ground can be limed if the soil is too acidic . Planting is usually done in the autumn or winter to allow the plants to become established before growth starts in the spring , but container @-@ grown stock can be planted at any time of year .

Two @-@ year @-@ old bushes are usually planted but strong one @-@ year @-@ old stock can also be used . Planting certified stock avoids the risk of introducing viruses . On a garden scale the plants can be set at intervals of 1 @.@ 5 to 1 @.@ 8 metres (5 to 6 ft) or they can be set in rows with planting intervals of 1 @.@ 2 metres (4 ft) and row separations of 2 @.@ 5 metres (8 ft) or more . In the UK , young bushes are generally planted deeper than their initial growing level to encourage new stems to grow from the base .

= = = Manures and fertilizers = = =

The blackcurrant requires a number of essential nutrients to be present to enable it to thrive ; nitrogen provides strong plant growth and stimulates the production of flower sprigs ; phosphorus aids growth , the setting of fruit and crop yield ; potassium promotes growth of individual shoots and increases the weight of individual fruits ; magnesium is a constituent of chlorophyll and helps increase yields through interaction with potassium ; calcium is required for cell division and enlargement and is particularly important for young plants and buds .

An annual spring mulch of well rotted manure is ideal and poultry manure can also be used but needs prior composting with straw or other waste vegetable material . Spent mushroom compost can be used but care should be taken as it often contains lime and blackcurrants prefer slightly acidic soils . The blackcurrant is a gross feeder and benefits from additional nitrogen , and phosphatic and potash fertilisers should also be applied annually . A balanced artificial fertilizer can be used and a 10 @-@ 10 @-@ 10 granular product can be spread around the bushes at the rate of .10 to .24 kg (0 @.@ 2 to 0 @.@ 5 lb) per plant . Weed growth can be suppressed with an organic mulch such as sawdust , bark , mushroom compost or straw , heavy plastic topped with an organic mulch cover or landscape fabric .

= = = Pruning = = =

Fruit in blackcurrants is borne primarily on one @-@ year @-@ old shoots . Newly planted bushes should be pruned severely , cutting all shoots back to two buds above ground level . This gives the plant a chance to get properly established before needing to put its energy into producing fruit . The general rule when pruning is to remove all weak shoots and those growing out sideways which may get weighed down when fruiting . The remaining branches should be thinned so as to remove old unproductive wood and encourage new shoots . An established bush should not be allowed to become overcrowded and should have about one third of its main branches or stems removed each year . When harvesting by machine , plants with an upright growth habit are encouraged .

= = = Harvesting = = =

On a garden scale , the berries should be picked when dry and ripe . Commercially , most harvesting is done mechanically by straddle harvesters . These move continually down the rows , straddling a row of bushes , shaking the branches and stripping off the fruit . The blackcurrants are placed into half tonne bins and to minimise stoppage time , some machines have cross conveyors which direct the fruit into continuously moving trailers in the adjoining row . A modern machine can pick up to fifty tonnes of blackcurrants in a day using only one operator and two tractor drivers . The bins should be stored in a cool place . Some fruit is still picked by hand for use in the fresh fruit market .

= = = Diseases and pests = = =

Ribes plants are susceptible to several diseases and a number of insect pests . However , new varieties have been developed , or are being developed , to overcome some of these problems .

Reversion is a serious disease transmitted by the blackcurrant gall mite Cecidophyopsis ribis . It causes a decline in yield and is quite widespread in Europe but is rarely encountered on other continents . Symptoms include a modification of leaf shape in summer and swollen buds (" big bud ") in winter , each housing thousands of microscopic mites . As pest control has limited effectiveness , severely infected bushes should be destroyed . All new plants purchased should be certified as virus @-@ free .

White pine blister rust (Cronartium ribicola) needs two alternate hosts to complete its lifecycle . One host is plants in the genus Ribes . On the blackcurrant , it causes the leaves to become pale and later develop tiny orange pustules and sometimes a yellow filamentous coating on some leaves . The fruit crop is little affected but the leaves fall early and growth is slowed the following year . The other host is any of the white pines , in which it causes serious disease and mortality for the North American species that have not co @-@ evolved with the rust .

American gooseberry mildew and powdery mildew can infect the leaves and shoot tips , and botrytis may cause the fruit to rot in a wet season . Currant and gooseberry leaf spot (Drepanopeziza ribis) is another disease of blackcurrants , but it is not usually a serious problem as most cultivars now have some resistance .

The blackcurrant leaf midge can cause browning , crimping and distortion of leaves at the tips of shoots but it is seldom a serious problem . The blackcurrant sawfly (Nematus ribesii) lays its eggs on the underside of the leaves and the voracious larvae work their way along the shoots , stripping off leaf after leaf . In a serious attack , the bush can be denuded of leaves . Larvae of the currant borer drill their way along the centres of shoots , which wilt and die back . Other insect pests include scale insects , aphids and earwigs .

= = = Research and breeding = = =

There are many cultivars of blackcurrant . ' Baldwin ' was the mainstay of the industry for many years but it has now largely been superseded by more productive and disease @-@ resistant varieties . During the 20th century in Europe , much hybridisation work has been carried out in order to reduce the plant 's susceptibility to disease and frost and also to increase yields . This effort centred especially on Russia , Sweden and Scotland .

In Britain the Scottish Crop Research Institute was tasked with developing new varieties suitable for growing in the north of the country . They produced new cultivars that had greater cold tolerance , especially in the spring , ripened earlier and more evenly and had greater fungal disease resistance . Frost tolerance was improved by selecting for late flowering and genetic research identified genes involved in resistance to gall mite and the blackcurrant reversion virus . ' Ben Lomond ' was the first of the ' Ben ' varieties and was released in 1975 . This was followed by several other cultivars for the juicing industry such as ' Ben Alder ' and ' Ben Tirran ' . The cultivar ' Ben Hope ' was released in 1998 with resistance to gall mite , and in the same year , ' Ben Gairn ' became available . It shows resistance to the reversion virus . For gardeners and the pick @-@ your @-@ own market , ' Ben Sarek ' , ' Ben Connan ' and ' Big Ben ' were introduced and have large , sweet berries . The cultivars ' Ben Connan ' , ' Ben Lomond ' and ' Ben Sarek ' have gained the Royal Horticultural Society 's Award of Garden Merit. and new varieties are being developed continually to improve frost tolerance , disease resistance , machine harvesting , fruit quality , nutritional content and fruit flavour .

Varieties producing green fruit , less strongly flavoured and sweeter than typical blackcurrants , are cultivated in Finland , where they are called " greencurrants " (viherherukka) . In Poland , the Research Institute of Horticulture has done work on improving the blackcurrant with regard to disease and pest resistance , fruit quality , adaptations to local conditions and mechanical harvesting . Researchers have crossed various varieties and introduced inter @-@ specific genetic

material from the gooseberry (Ribes grossularia) , the red currant (Ribes rubrum) and the flowering currant (Ribes sanguineum) . The resulting offspring were further back @-@ crossed to R. nigrum . Cultivars produced include ' Tisel ' and ' Tiben ' in 2000 and ' Ores ' , ' Ruben ' and ' Tines ' in 2005 . Further cultivars ' Polares ' and ' Tihope ' are being tested . Since 1991 , New Zealand has become an important centre for research and development , as its temperate climate is particularly suitable for cultivation of the crop . Breeding programmes are concentrating on yield , large fruit size , consistency of cropping and upright habit .

In North America , there is a need for this fruit to have resistance to white pine blister rust . New cultivars such as ' Crusader ' , ' Coronet ' and ' Consort ' have been developed there by crossing R. nigrum with R. ussuriense and these show resistance to the disease . However the quality and yield of these varieties are poor as compared to non @-@ resistant strains and only Consort is reliably self @-@ fertile . Back @-@ crossing these varieties to a parent have produced new strains such as ' Titania ' that have a higher yield , better disease resistance , are more tolerant of adverse weather conditions and are suitable for machine harvesting . Two new releases from a black currant breeding program in British Columbia , Canada , ' Blackcomb ' and ' Tahsis ' , were selected for their immunity to white pine blister rust and their frost tolerance .

= = History = =

The blackcurrant is native to northern Europe and Asia . It was cultivated in Russia by the 11th century when it was present in monastery gardens and also grown in towns and settlements . Cultivation in Europe is thought to have started around the last decades of the 17th century . Decoction of the leaves , bark or roots was also used as traditional remedies .

During World War II , most fruits rich in vitamin C , such as oranges , became difficult to obtain in the United Kingdom . Since blackcurrant berries are a rich source of the vitamin and blackcurrant plants are suitable for growing in the UK climate , the British Government encouraged their cultivation and soon the yield of the nation 's crop increased significantly . From 1942 onwards , blackcurrant syrup was distributed free of charge to children under the age of two , and this may have given rise to the lasting popularity of blackcurrant as a flavouring in Britain . In Britain the commercial crop is completely mechanised and about 1 @,@ 400 hectares of the fruit are grown , mostly under contract to the juicing industry . Commercially , most large @-@ scale cultivation of blackcurrants is done in eastern Europe for the juice and juice concentrate market .

Blackcurrants were once popular in the United States as well , but became less common in the 20th century after currant farming was banned in the early 1900s , when blackcurrants , as a vector of white pine blister rust , were considered a threat to the U.S. logging industry . The federal ban on growing currants was shifted to jurisdiction of individual states in 1966 , and was lifted in New York State in 2003 through the efforts of horticulturist Greg Quinn . As a result , currant growing is making a comeback in New York , Vermont , Connecticut and Oregon . However , several statewide bans still exist including Maine , New Hampshire , Virginia and Massachusetts . Since the American federal ban curtailed currant production nationally for nearly a century , the fruit remains largely unknown in the United States , and has yet to regain its previous popularity to levels enjoyed in Europe or New Zealand . Owing to its unique flavour and richness in polyphenols , dietary fibre and essential nutrients , awareness and popularity of blackcurrant is once again growing , with a number of consumer products entering the U.S. market .

= = Uses = =

= = = Culinary uses = = =

The fruit of blackcurrants can be eaten raw , but it has a strong , tart flavour . It can be made into jams and jellies which set readily because of the fruit 's high content of pectin and acid . For culinary use , the fruit is usually cooked with sugar to produce a purée , which can then be passed through

muslin to separate the juice . The purée can be used to make blackcurrant preserves and be included in cheesecakes , yogurt , ice cream , desserts , sorbets and many other sweet dishes . The exceptionally strong flavour can be moderated by combining it with other fruits , such as raspberries and strawberries in summer pudding , or apples in crumbles and pies . The juice can be used in syrups and cordials . Blackcurrants are a common ingredient of Rødgrød , a popular kissel @-@ like dessert in North German and Danish cuisines .

Blackcurrants are also used in savoury cooking because their astringency creates added flavour in many sauces , meat and other dishes and they are included in some unusual combinations of foods . They can be added to tomato and mint to make a salad , used to accompany roast or grilled lamb , used to accompany seafood and shellfish , used as a dipping sauce at barbecues , blended with mayonnaise , used to invigorate bananas and other tropical fruits , combined with dark chocolate or added to mincemeat in traditional mince pies at Christmas .

Japan imports $ 3 @.@ 6 million of New Zealand blackcurrants for uses as dietary supplements , snacks , functional food products and as quick @-@ frozen (IQF) produce for culinary production as jams , jellies or preserves .

= = = Beverages = = =

The juice forms the basis for various popular cordials , juice drinks , juices and smoothies . Typically blended with apple or other red fruits , it is also mixed with pomegranate and grape juice . Macerated blackcurrants are also the primary ingredient in the apéritif liqueur crème de cassis , which in turn is added to white wine to produce a Kir or to champagne to make a Kir Royale .

In the United Kingdom , blackcurrant cordial is often mixed with cider (hard cider) to make a drink called " cider and black " . If made with any common British lager beer , it is known as a " lager and black " . The addition of blackcurrant to a mix of cider and lager results in " diesel " or " snakebite and black " available at pubs . A " black ' n ' black " can be made by adding a small amount of blackcurrant juice to a pint of stout . The head is purple if the shot of juice is placed in the glass first . Blackcurrant juice is sometimes combined with whey in an endurance / energy @-@ type drink .

In Russia , blackcurrant leaves may be used for flavouring tea or preserves , such as salted cucumbers , and berries for home winemaking . Sweetened vodka may also be infused with blackcurrant leaves making a deep greenish @-@ yellow beverage with a tart flavour and astringent taste . The berries may be infused in a similar manner . In Britain , 95 % of the blackcurrants grown end up in Ribena (a brand of fruit juice whose name is derived from Ribes nigrum) and similar fruit syrups and juices .

= = = Food value = = =

= = = = Nutrients = = = =

Raw blackcurrants are 82 % water , 15 % carbohydrates , 1 % protein and 0 @.@ 4 % fat (table) .

Per 100 g serving providing 63 calories , the raw fruit has high vitamin C content (218 % of the Daily Value , DV) and moderate levels of iron and manganese (12 % DV each) . Other nutrients are present in negligible amounts (less than 10 % DV , table) .

= = = = Phytochemicals = = = =

Phytochemicals in the fruit and seeds , such as polyphenols , have been demonstrated , with ongoing laboratory studies assessing their potential to inhibit inflammation mechanisms of heart disease , cancer , microbial infections or neurological disorders like Alzheimer 's disease .

Major anthocyanins in blackcurrant pomace are delphinidin @-@ 3 @-@ O @-@ glucoside , delphinidin @-@ 3 @-@ O @-@ rutinoside , cyanidin @-@ 3 @-@ O @-@ glucoside , and cyanidin @-@ 3 @-@ O @-@ rutinoside which are retained in the juice concentrate among other

yet unidentified polyphenols .
Blackcurrant seed oil is rich in nutrients , especially vitamin E and unsaturated fatty acids , including alpha @-@ linolenic acid and gamma @-@ linolenic acid .

= = = Use in traditional medicine = = =

In Europe the leaves have traditionally been used for arthritis , spasmodic cough , diarrhea , as a diuretic and for treating a sore throat . The berries were made into a drink thought to be beneficial for treatment of colds and flu , for other fevers , for diaphoresis and as a diuretic . In traditional Austrian medicine , Ribes nigrum fruits have been used internally (consumed whole or as a syrup) for treatment of infections and disorders of the gastrointestinal tract , the locomotor system , the respiratory tract and the cardiovascular system .

= = = Other uses = = =

Blackcurrant seed oil is an ingredient in cosmetics preparations , often in combination with vitamin E. The leaves can be extracted to yield a yellow dye and the fruit is a source for a blue or violet dye .