

Broccoli is a popular vegetable that's consumed all year round and has expanded steadily in area over the last number of years. In 2016 an estimated 528 hectares were grown which makes it the third largest crop after cabbage and carrots. It's a half-hardy crop that is harvested from mid-June to mid-November – a five month crop. Supply for the rest of the year is from Spanish imports.

SOIL TYPE Broccoli will grow on a wide range of soil types provided they are well drained and structured. Early crops are best suited to lighter soils.

PH The pH of the soil should preferably be between 6-7.5. Below a pH of 5.7 growth is increasingly restricted.

ROTATION Allow a break of 4-5 years between all brassicas. In naturally occurring high alkaline soils, continuous production with brassicas is possible without detrimental effects.

ASPECT For autumn cropping choose fields with an open or even exposed aspect to lessen the incidence of spear rot.

SYSTEM Broccoli can be grown on the flat, on drills or on raised beds.

FERTILIZER Apply the following amounts (kg/ha) according to soil analysis:

Index	1	2	3	4
N	120	115	100	90
P	65	45	35	20
K	250	200	170	125

Nitrogen topdressing: up to 120 kg/ha if required

If P is > 15 mg/kg or K is > 250 mg/kg, no extra fertiliser is required

Compounds Normally a boronated compound is used such 8-5-18, 8-3-18 or 6-10-18.

Nitrogen Broccoli is usually top-dressed with CAN about a month after transplanting with an application that does not exceed a total application to the crop of 240 kg/ha (base and top dressing combined). Excessive applications of nitrogen make a crop more susceptible to wet rot and bruising. Broccoli has reasonably low requirements for nitrogen. Typically 120-160 kg/ha will be applied.

CULTIVARS The No. 1 variety is Parthenon - does well in both wet and dry weather. Others to consider are Monaco for early and Steel for late. Ironman doesn't suit the heat – can open up yellow. Steel is very resistant to wet rot so good for late production but is about a week later to mature than others. Larsen is a new one to consider for late production. Titanium, Triton and Shard also worth looking at.

PROPAGATION Broccoli is normally propagated in modules under protection and transplanted out after hardening off. Usual module size is 308 or 345. A larger 216 module can be used for first early crops. The length of time from sowing to transplanting is normally 5-7 weeks. See the section on Cropping Programme for times of sowing.

EARLY CROPS Maturity can be advanced by one to two weeks by covering early crops with fleece. Remove about three weeks before harvest. For first early crops sow last week of September or in January (frost protection required – minimum 3°C) for planting out in March under fleece to crop in mid-June. Uncovered crop planted out from mid-April on.

CROPPING PROGRAMME

Source: Europrise

	Sowing	Planting	Harvesting
	Mid January	Mid/Late March	Mid June
	Mid February	Early April	Late June
	Late February	Mid April	Early July
	Early March	Late April	Mid July
	Mid March	Early May	Mid July
	Late March	Mid May	Late July
	Early April	Late May	Early August
	Mid April	Early June	Mid August
	Late April	Mid June	Late August
	Early May	Late June	Early September
	Mid May	Early July	Mid/Late September
	Late May	Mid July	Early October
	Early June	Late July	Mid October
	Late June	Early August	Late October
Broccoli takes about 65 to 85 days from transplanting to harvest			

SUCCESSION For harvesting succession transplant once a week and twice a week during July using different maturity date varieties.

SPACING For 500g heads:
 Drill: 70 x 35 cm / 40,800 plants/ ha. For main season crops.
 Drill: 70 x 40 cm / 35,700 plants/ ha. For early and late crops.
 3 row bed/Flat: 60 x 40 cm / 41,600 plants/ ha. For main season crops.
 3 row bed/Flat: 60 x 45 cm / 37,000 plants/ ha. For early and late crops.

IRRIGATION Apply to establish a crop after transplanting in dry weather and at other times in prolonged dry spells to ensure continuity and increased head weight. When applied later it should finish about 2 weeks before harvest to prevent damage to the wax layers on the head and to reduce risk of spear rot.

WEEDS Stomp Aqua can be applied at 2.9 l/ha within 24 hours of planting followed by 1.0 l/ha Butisan S 5-6 days post-planting. An alternative to Stomp Aqua would be Wing P at 2 l/ha applied pre-planting. For improved control of cleavers, fool's parsley and fumitory tank-mix Gamit at 0.2 l/ha with Butisan. Gamit can cause a white discolouration of the leaf but the crop grows out of it – to minimize damage apply within a few days of planting. Dual Gold can also be tank mixed with Butisan or used as substitute for it.

WEEDS (cont'd) The only contact herbicides available are Lentagran and Dow Shield. For best effect with Lentagran (2 kg/ha) use it within 3 weeks of planting when the weeds are small and don't apply any other pesticide within 10 days of application. Dow Shield (2 l/ha) will only control groundsel, mayweed, corn marigold, sowthistle and thistles. Another alternative is to use half rates of Butisan S + Lentagran just when weeds begin to show. Stratos Ultra is the only graminicide registered for broccoli.

PESTS Cabbage root fly, aphids and caterpillars are the three commonest pests to attack broccoli.

Cabbage root fly Apply Tracer or Verimark as a drench to modules just prior to planting out at the rate of 12/15 ml per 1000 modules respectively. These products should be washed off the leaves immediately after drenching. Verimark which is systemic in action is also effective against flea beetle, aphid and caterpillar for the first 6 weeks or so after planting.

Very occasionally you may come across cabbage root fly larvae in the head of broccoli in cases where eggs have been laid in the head.

Aphids The two main aphids that attack broccoli are mealy aphid and peach potato aphid. It is important to keep them from establishing in the developing head of broccoli. Apply an aphicide as soon as seen. The main build-up period is from July to September.

Product	Rate	Max. No.	HI
Closer	200 ml/ha	1	1 week
Biscaya	0.4 l/ha	2	1 week
Movento	0.5 l/ha	2	3 days

Caterpillars May be troublesome in certain crops – spray when seen. Diamond Back moth can be very damaging during warm summers and in bad attacks frequent spraying is necessary; use a spreader (e.g. Tarpoon, Silwet or Break-thru) with any of the products below.

Product	Rate	Max. No.	HI
Benevia	400-500 ml/ha	2	1 week
Karate Zeon	50 ml/ha	4	None
Steward	85 g/ha	3	1 day
Decis Protech	500 ml/ha	2	1 week

Flea beetle Normally only a problem to young plants if numbers are high which can happen during periods of warm settled weather. Apply Karate or Decis Protech at the above rates.

Slugs May damage established plants and curds can be grazed especially around the headlands. Apply just after planting using a metaldehyde or ferric phosphate based slug pellet.

Pigeons/rabbits It is essential to take precautions before damage occurs from either of these two pests. Pigeons are worst during May and June. The best approach to rabbit control is to fence in front of their runs.

DISEASES	The major diseases of broccoli are downy mildew and wet rot. White blister can be a problem in certain areas.
<i>Downy mildew</i>	Cool moist conditions favour this disease and usually not a problem until later in the season in autumn crops. Apart from leaf infections it can also cause a systemic infection of the stem which can later appear on the florets. Apply Ridomil Gold at 2 kg/ha in the August to October period. Harvest interval is 30 days.
<i>White blister</i>	This disease can occasionally be troublesome especially in intensive production areas. Foliage and head can both be attacked. Watch out for the disease, particularly in the months of August and September, and spray if seen with Ridomil Gold. Amistar, Signum or Nativo used preventatively can be effective against white blister.
<i>Spear rot</i>	Also known as wet rot. Can cause major problems in late crops. Spear rot first appears as a discrete blemish on the head, the cause of which is not known. Subsequently bacterial rots invade to form water-soaked areas that quickly develop into a black soft rot. It is typically occurs in the autumn when humidity is high. For late crops choose open fields so that wind can dry crops after rain. Watch nitrogen use, as excessive applications will encourage spear rot. Signum may have some effect on reducing levels of wet rot. Use the more resistant varieties for September to November harvests e.g. Steel, Parthenon.
DISORDERS	
<i>Blindness</i>	Blindness, characterised by the absence of a growing point, is due to a combination of low light and cold temperatures during the propagation stage. It is seen in January-February sowings. To counter it ensure a minimum temperature of 3-5°C during the propagation stage. Overwintered plants are not prone to this disorder. Variety can play a part. The old variety Marathon was very susceptible, Parthenon is less so.
<i>Buttoning</i>	This is where the transplant receives a growth check, especially a cold check, that results in the formation of a small unsalable head. Shows up in the early crops – ensure frost protection for January sowings.
<i>Bracting</i>	Can occur under high temperatures or where you get start-stop growth in a crop – results in small leaves or bracts growing up through the curd. Some varieties are worse than others in this respect e.g. Parthenon and Green Magic.
HARVESTING	Broccoli is normally harvested from June into November. The crop is usually cut over two to three times using a rig. It is either packed directly into a market container or brought to the packhouse for packing.
COOLING	To increase the shelf-life of broccoli it must be rapidly cooled post harvest. Equipment should be capable of reducing the temperature to below 6°C within 12 hours. Hold at a temperature of 3-5°C and at a relative humidity of 95%. Will hold in a cold room for about 7-10 days. Broccoli is sensitive to chilling injury and should not be held at temperatures below 2°C.

YIELD

The yield of broccoli can vary considerably depending on whether the crop is early, mid-season or late. A good average yield over the season would be 8-9 tonnes per hectare. Head weight specification is normally 500g with smaller heads in the 300-350g range.