

Broccoli is a popular vegetable that's consumed all year round and has expanded steadily in area over the last number of years. In 2014 a total of 590 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.

**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     | 100 | 90  | 80  | 70  |
| P     | 60  | 45  | 35  | 20  |
| K     | 250 | 180 | 170 | 125 |

Nitrogen topdressing: 140 kg/ha

*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. Trials have shown that broccoli, especially crops maturing from August to October can produce good yields with low inputs of N.

**CULTIVARS** The No. 1 variety is Parthenon which does well in both wet and dry weather. Others to consider are Steel or Ironman, and the newer varieties of Eos, Triton and Covina. Monaco and Aguiles are used for early production but the latter variety won't hold. Steel is very resistant to wet rot but is about a week later to mature than the other varieties. Eos can be prone to the beads turning brown in sunny weather – better suited to an overcast summer. Monrello is a new one to consider for late production.

**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 first week of February (heat required) for planting out in March under fleece to crop in June.

**CROPPING PROGRAMME**

Source: Europrise

|   | <b>Sowing</b>  | <b>Planting</b> | <b>Harvesting</b>  |
|---|----------------|-----------------|--------------------|
|   | Early February | 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 from 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** 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 increase 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** The standard programme is 2.9 l/ha Stomp Aqua applied within 24 hours of planting followed by 1.5 l/ha Butisan 5-6 days post-planting. For improved control of groundsel, mayweed, cleavers, fool's parsley and shepherd's purse tank mix Gamit at 0.25 l/ha with Butisan. Wing P at 4 l/ha pre-planting could be used as a substitute for Stomp Aqua. Devrinol is an alternative to the pendimethalin based sprays of Stomp or Wing P and can usefully be used in combination with Butisan. It's incorporated pre-planting at 1.9 l/ha.

**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 a tank mix of Butisan + Lentagran 2-3 weeks after planting – suggest ½ rates of both. The only available graminicide is Aramo at 1.5 l/ha.

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

*Cabbage root fly* Apply Dursban as a drench to the modules just prior to planting out at the rate of 50 ml in 5 litres of water per 5000 modules. This should be washed off the leaves immediately after drenching.

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      |
|-----------|----------|----------|---------|
| Aphox     | 420 g/ha | -        | 3 days  |
| Biscaya   | 0.4 l/ha | 2        | 1 week  |
| Dursban 4 | 1 l/ha   | 1        | 3 weeks |
| Movento   | 0.5 l/ha | 2        | 3 days  |
| Plenum    | 400 g/ha | 3        | 2 weeks |

*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 and use a spreader (e.g. SW 7, Silwet or Break-thru) with any of the products below.

| Product           | Rate      | Max. No. | HI      |
|-------------------|-----------|----------|---------|
| Barclay Cypersect | 250 ml/ha | -        | None    |
| Dursban 4         | 1.5 l/ha  | 1        | 3 weeks |
| Karate Zeon       | 100 ml/ha | 4        | None    |
| Steward           | 85 g/ha   | 3        | 1 day   |
| Topple 10         | 250 ml/ha | -        | None    |

*Flea beetle* Normally only a problem to young plants if numbers are high which can happen during periods of warm settled weather. Apply Dursban or Karate at the above rates or Pyrethrum 5EC at 20 ml in a 100 litres of water.

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

*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.

*Downy mildew* 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.

*White blister* 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.

*Spear rot* 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

*Blindness* Blindness characterised by the absence of a growing point, may be due to a number of causes but typically poor light conditions during the propagation stage can induce it. Hence it is typically seen in early crops.

*Buttoning* This is where the transplant receives a growth check of any sort, especially a cold check, that results in the formation of a small unsaleable head. Shows up in the early crops.

*Bracting* 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 it at a temperature of 3-5°C and at a relative humidity of 95%. Will hold in a cold room for 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 7.5 tonnes per hectare. Head weight specification is normally 500g with smaller heads in the 300-350g range..