BRUSSELS SPROUTS

Technical Note
March 2020
Horticultural Dept

Brussels sprouts is a crop that can be produced from August to March but the bulk of the sales are in December to satisfy the Christmas market. It's a crop that has been declining in popularity over the years. In 2016 the estimated area grown was 159 ha. Most of the crop is grown in counties Dublin and Meath.

SOIL TYPE

Brussels sprouts will grow on a wide range of soil types provided they are well drained and structured. It's a crop that is well suited to heavier soil types such as silt and clay loams.

PH

The pH of the soil should preferably be between 6.5-7.5. Below a pH of 5.7 growth is increasingly restricted.

ROTATION

Allow a break of 4-5 years between all brassicas. The major disease concern from tight rotations is club root.

SYSTEM

Brussels sprouts are propagated in modules under protection and then transplanted out. They are normally grown on drills but can also be grown on the flat or on raised beds.

FERTILIZER

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

Index	1	2	3	4
N*	120	115	105	100
P**	65	45	35	20
K**	250	200	170	125

* Use up to 180 kg/ha of N for top dressing
** If P is > 15 ppm or K is > 250 ppm, no extra fertiliser is required.

Compounds

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

Nitrogen

Sprouts are heavy feeders and are usually top-dressed with CAN or calcium nitrate in 1-2 splits starting about a month after transplanting with an application that does not exceed a total application to the crop of 300 kg/ha (base and top dressing combined).

CULTIVARS

Sprout varieties can be roughly divided into early, mid season and late, spanning the months mid-August to October, November to December and January to March respectively. There are many to choose from but the following varieties are commonly grown: Abacus, Martee, Martinez, Platinus, Profitus, Batavus, Hector, Profitus, and Albarus (listed in order of maturity).

PROPAGATION

Sprouts are 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.

CROPPING PROGRAMME	Sowing	Planting	Harvesting
Early	March	April	August-September
Mid season	Early-mid April	May	October-December
Late	April	May-early June	December-March

SUCCESSION

For harvesting succession use a combination of variety choice and planting dates. The early crop gets planted in April with the main to late crops planted during May and June. Finish late plantings by the end of the first week in June for maximum yields.

SPACING

70 x 45 cm (31,700 plants/ha)
70 x 40 cm (35,700 plants/ha)
60 x 50 cm (33,330 plants/ha)
60 x 45 cm (37,080 plants/ha)

Plant populations for sprouts will vary from about 31,000 to 37,000 per hectare. Increasing plant population will result in smaller sprouts, increased stem length and greater uniformity of sprout development on the stem. In relation to these characteristics overall plant population has been found to be more important than the spatial arrangement of the plants.

IRRIGATION

Normally only applied to establish a crop after transplanting in prolonged spells of dry weather.

WEEDS

The main residual herbicides that are used on sprouts are Butisan, Stomp Aqua, Wing P, Dual Gold, Devrinol, Bonalan and Gamit. A possible combination would be Bonalan or Wing P at half rate pre-planting followed by Butisan post planting. To improve the spectrum of weeds controlled, tank mix Gamit at 180 ml/ha with Butisan – will improve control of fumitory, mayweed and cleavers and give useful suppression of fool's parsley.

The only contact herbicides available are Lentagran and Dow Shield or Croplink Clopyralid. Lentagran (2 kg/ha) is limited in the spectrum of weeds it controls and may cause discolouration to the crop. It works best when the weeds are small. It could also be used in a tank mix with Butisan – suggest a tank mix of ½ rate Butisan and ½ rate Lentagran 2-3 weeks after planting when the weeds are small. Dow Shield (1 l/ha) will only control groundsel, mayweed, corn marigold, sowthistle and thistles. Shield can be used at half rate combined with full strength Lentagran as a contact spray when weeds are in the seedling stage. If volunteer cereals or scutch is a problem apply Stratos Ultra at 1.5-4 l/ha.

PESTS

Cabbage root fly, aphid, caterpillar and slugs are common pests that attack Brussels sprouts.

Cabbage root fly

Extremely common pest whose larvae attack the roots of all brassicas. 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 of the leaves immediately after drenching.

Cabbage root fly cont. Verimark which is systemic in action is also effective against flea beetle, aphid and caterpillar for the first 6 weeks or so after planting.

Aphids The two main aphids that attack sprouts are mealy aphid and peach potato aphid. It's important to keep them from establishing in the developing sprout buttons. Apply an aphicide as soon as seen. The main build-up period is from July to September. Improved early control of aphids will result using Verimark for cabbage root fly control.

Product	Rate/ha	Max. No.	HI
Closer	200 ml	1	1 week
Biscaya	0.4 l	2	1 week
Insyst	250 g	1	3 weeks
Movento	0.5 l	2	3 days
Teppeki	140 g	2	2 weeks

Caterpillars May be troublesome especially in the June to September period – spray when seen. Diamond Back moth can be very damaging during warm summers; 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
Decis	300 ml/ha	2	1 week
Karate Zeon	50 ml/ha	4	None
Steward	85 g/ha	3	1 day
Tracer	200 ml/ha	4	3 days

Flea beetle Normally only a problem if numbers are high during warm dry spells and if the plants are small. Apply Decis at 300 ml/ha.

Slugs Can cause unmarketable crops if high numbers of slugs attack the buttons. Apply 3-5 applications of slug pellets during the summer to autumn period. The two actives that are available are metaldehyde or ferric phosphate. Both are equally effective in combatting slugs. There are many metaldehyde brands to choose from. Ferric phosphate is available as Sluxx HP.

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 sprouts are leaf spot diseases – ring spot and to a lesser extent Alternaria. They can also be affected with white blister, light leaf spot and club root.

Ring spot This leaf spotting disease will affect the leaves first and if not controlled will move down to the buttons. Cool moist conditions favour this disease and is worst in wet years. There are a good range of actives available to control ring spot: Amistar, Nativo, Rudis, Score and Signum.

White blister	This disease can be troublesome especially in intensive production areas. Both foliage and buttons are attacked. Watch out for the disease, particularly in the months of August and September. Amistar, Signum or Nativo used preventatively can also be effective against white blister.
Alternaria	A leaf spotting disease that can be confused with ring spot but is less common. Keep an eye out for it especially if the crop is close to oilseed rape as airborne inoculum can occur when rape is harvested. All the ring spot sprays are effective against Alternaria.
Light leaf spot	Can attack both leaves and buttons. Small groups of black dots occur in a thumb print pattern measuring 1-2 cm in diameter. Broad spectrum fungicides such as Nativo and Rudis used for other diseases will control light leaf spot. This is another disease that can spread from oilseed rape.
Club root	Attacks all brassicas where they have been tightly rotated particularly on acid soils. Maintain wide rotations of 4-5 years between brassica crops and ensure that the ground is adequately limed. Club root will not express itself at a pH of 7.4 or greater.

DISORDERS

Internal browning	This physiological disorder produces necrotic areas inside the sprout starting in the youngest tissue at the centre. It is thought to be caused by a localised calcium deficiency that can be induced by a stress condition such as drought. Excessive nitrogen applications can also be a contributory factor. Modern varieties are less susceptible to the disorder that older varieties.
STOPPING	Sprouts that are single harvested are sometimes stopped by removing the growing point of the plants. This accelerates the development of the upper sprouts giving an even sprout size at harvest. Stop the plants when 50% of the sprouts are 12 mm in diameter. Time of stopping is related to harvest date – about 4 weeks before harvest in August, 6 weeks for October crops and 10 weeks prior to harvest for December crops. Stopping too early leads to blowing of the upper sprouts. Do not stop sprouts after the end of October.
HARVESTING	Sprouts are normally harvested from August to March. Most of the crop is machine harvested but for small acreages hand picking is the norm. Sometimes it can be a combination of the two – the early crop is hand picked with the remainder being machine harvested. The crop is then graded in the packhouse. It's normally split graded into 22-30 mm and 30-38 mm sizes and sold in 500g nets.
COOLING	To maintain shelf life of early crops they must be rapidly cooled post harvest. Equipment should be capable of reducing the temperature to below 3°C within 12 hours. Hold product at a temperature of 3-5°C and at a relative humidity of 95%.
YIELD	The yield of sprouts can vary from 12 to 20 tonnes per ha. A good average yield over the season would be 15 tonnes per hectare.

Ring spot

Alternaria

Mealy aphid

Diamond back moth - larva and adult