



BROCCOLI

Production & Spray Guide



Broccoli Production Guide

“Integrated Crop Solution”

General

Broccoli is a vegetable rich in vitamin C, protein, fibre and flavour. It is also known as a “Super Food”. Broccoli belongs to the “Brassica – Genus” fairly closely related to Cabbage, Brussels sprouts and Cauliflower. Broccoli types are, Large headed varieties, Sprouting varieties and Romanesco varieties. Large headed are the standard type with heads weighing from 400grams up 850 grams. Sprouting broccoli like Purple Sprouting and Green sprouting broccoli produces numerous heads on long stalks and Romanesco varieties produce elegantly swirled heads composed of symmetrically pointed spirals. These large plants need plenty of growing space. In Zimbabwe the best growing climate for growing Broccoli is during the cool weather conditions of winter. During the hot, wet conditions of summer the head sizes tend to be smaller. Consult a Prime Seed Agronomist on which are the best varieties for winter and summer production. Tasty in each of its varieties, Broccoli is easier to grow than its relatives Cauliflower and Brussels sprouts and can produce bountiful crops. Always in high demand on the dinner table.

Site Selection

Broccoli grows very well in medium to medium heavy clay loam with good water holding capacity. It can be grown however in more sandier soils but will require more frequent irrigations and higher fertilizer rates. PH levels should be from 5.8 – 6.5 as Broccoli likes to have an alkaline soil. Broccoli responds very well to compost and organic enriched soils. Levels round 25 – 35 tons of well- prepared compost or farm yard manure will benefit the crop and help reduce the levels of costly fertilizers. Make sure compost and manure are well broken down when put in the fields or root burn may occur. Chicken litter can also be used at 2 – 5 tons per hectare but must be well composted. If ploughing, plough to a depth of 30 – 35cm which will make sure the soil is prepared for good root development, but make sure any old plough pan is broken up. If ripping then discing is preferred, this is also a good way of preparing a tilth. The soil should not be too cloddy, also not too fine. During winter months plant if possible on North facing slopes to achieve better soil warmth.

Spacing

If planting on beds which are at 1.5m centre to centre the in row should be 30cm apart and two rows placed on the bed 50 – 60cm apart. This should give approximately 44,000 plants per hectare. Planting on the flat, rows can be 40cm apart and in row of 35cm apart. Higher plant populations give smaller heads so populations should be governed by market requirements.

Fertilizer

Broccoli can be susceptible to hollow stem problems caused by a Boron deficiency. If there is a Boron deficiency in the soil apply Solubor as a foliar spray every 2 weeks at a rate of 10grams/ 1 litre water. A balanced Basal type fertilizer of either “A” “B” or “C” should be applied before planting. A vicon spreader can be used to broadcast the fertilizer on the flat or a ridger type applicator to apply the fertilizer if the crop is to be grown on beds. Cupping with fertilizer cups by hand into the pre-marked planting holes can also be done but the fertilizer must be well mixed in the hole with the soil to prevent root burn.

On soil analysis results the rates of fertilizer can be adjusted to the rate to be applied and if compost or manure have been applied the rate can also be reduced. Fertilizer rates of 500kg – 750kg per hectare can be applied. Broccoli requires around 400kg per hectare of A.N. split into 3 applications from 3 weeks up to 6 weeks after transplanting. If the crop is being planted on sandier soils and also during the rainy season extra top dressings might be required after heavy leaching rains. Plantings going into mid-winter should be top dressed with Calcium Nitrate, instead of A.N. as it works quicker in cool soils.

Seedlings

Planting with seedlings is the most practical method. Use a recognised Nursery like Prime Plants Nursery where strong and healthy seedlings are produced. By transplanting good seedlings this gives a base for a more uniform crop helping with reduced costs at harvest time. Order around 10% more seedlings for your selected plant population from the Nursery to ensure best seedling selection when transplanting. When using seedlings or speedlings as they are most commonly known, at transplanting make sure that good plug to soil contact is made so the root system can leave the plug and quickly enter into the soil enriched with either fertilizer or compost. Plant the speedlings as soon as possible after collecting them from the Nursery to avoid the tiny hair roots from drying out. Plant the plugs/speedlings into pre irrigated soils in which the field has been brought up to field capacity. After transplanting a light settling in irrigation is required to remove tiny air pockets between the plug and the soil.

Varieties

Selection of a variety depends if it is to be marketed as fresh or frozen. Broccoli is usually a cool weather crop but can be grown year round with correct variety selection, this is where your Prime Seed Agronomist can advise. Broccoli is quite frost tolerant. There are two types, heading and sprouting. Sometimes selected varieties might produce side shoots once the main head has been harvested. Variety selection will also have maturity dates varying from 60 – 75 days.

Harvesting

Time of harvest is primarily determined by the tightness of the florets and not by the size of the head. The head should be firm and compact, not opening and loose. If leafy points have come through the head before harvest it shows harvesting is late, or the plant has been under stress. This is more common in hot summer weather conditions when head size is generally smaller than in winter production. When harvesting cut the central stalk at a 45 degree angle, 13 – 20cm below the head. This will keep water from pooling inside the cut stem and causing rot. Broccoli has a poor shelf life at ambient temperatures so the harvested heads will require cold storage or if being delivered to the market fresh, in the shortest possible time. Brown or Purple beads is a physiological problem that is more prevalent under hot humid conditions.

Irrigation

Regular water applications during the dry winter months is essential. Overhead irrigation or centre pivot irrigation is the most common followed by flood and more recently drip irrigation which is becoming more affordable. Broccoli like cauliflower, the irrigations must be spot on or “Hollow stem” will occur due to fluctuations of water levels in the soil. Approximately 600mm – 750mm of irrigation should be allowed for to produce a quality Broccoli crop. Therefore planning water usage from Dams, rivers and boreholes can be worked out to match hectares to be planted. As the plant increases in size and leaf area, and the head starts to form, the amount of water required also increases. Irrigation should be planned on a weekly basis and the soil depletion area checked regularly to plan for the next irrigation cycle. A quick test is to take a fist full of soil in your hand, squeeze it to form a ball then tap the “ball” with your finger, if it collapses it is becoming dry and irrigation should be applied immediately. Preferably it should not have gone as far as this stage. The use of an evaporation pan should help with scheduling.

Rotations

In rotation planning do not follow with Broccoli if the previous crop has been a Brassica type i.e. Cabbage, Cauliflower or Rape. Always rotate with a legume or root crop.

Broccoli Spray Guide

Stage	Nursery	Transplanting & Establishment	Rapid Leaf Growth	Floret Formation	Floret / Head Expansion	Harvest
Days:	0-30	30-35	40-60	50-70	65-90	90-130
Pest Problems						
Soil Pests & Aphids		Actara Soil drench or Dip				
Cutworms		Karate Zeon / Ampligo				
Diamond back Moth			Ampligo / Match / Karate Zeon / Proclaim			
General Caterpillars				Ampligo / Match / Karate Zeon / Proclaim		
Aphids & Whitefly		Actara Soil drench				

Stage	Nursery	Transplanting & Establishment	Rapid Leaf Growth	Floret Formation	Floret / Head Expansion	Harvest
Days:	0-30	30-35	40-60	50-70	65-90	90-130
Disease Problems						
Damping off & Black Leg	Apron Star Seed Dress					
Bacterial Black Rot			Bion / Copper Oxy			
Downy Mildew			Revus / Ridomil / Folio Gold / Bravo			
Club Root		Quintozene				
Alternaria, Powdery Mildew, White Blister & Ring Spot			Bravo / Ortiva / Score			

Stage	Nursery	Transplanting & Establishment	Rapid Leaf Growth	Floret Formation	Floret / Head Expansion	Harvest
Days:	0-30	30-35	40-60	50-70	65-90	90-130
Weed Problems						
Before planting - post emergence perennials		Touchdown				
Before planting - post emergence annuals		Gramoxone / Touchdown				
Pre-emergence: grasses		Dual Magnum				
Post-emergence: grasses			Fusilade Forte			



CROP	DAYS TO MATURITY		PLANT SPACING (cm)		PLANTS/HA X1000	AVERAGE SEED PER GRAM	SEED REQUIREMENT (Kg/Ha)	COMMON PESTS	COMMON DISEASES
	WARM	COOL	IN ROW	BETWEEN					
Garden Beans	55	65	2x7*	50	285	4-5	75	Bollworm	Rust Anthracnose Halo Blight
Beetroot	80	110	10*	20	450	50-60	8	Aphids	<i>Ccpa</i> <i>Rzoc</i>
Broccoli	70	90	40	70	36	225	0.2	Diamondback Moth Aphids	Black Rot White Blister
Butternut	90	120	50	100	20	8-10	3	Fruit Fly	Gummy Stem Blight Anthracnose
Cabbage	80	110	40	50	30	300	0.2	Diamondback Moth Aphids	Black Rot Club-root S
Carrot	90	120	3*	15	1100	800	2	Nematodes	<i>ta</i>
Cauliflower	85	110	40	70	36	240	0.2	Diamondback Moth Aphids	Black Rot Club-root
Cucumber Field	60	85	40	150	16	40	16 000 Seeds	Red Spidermite Aphids Whitefly	<i>Fm</i> Powdery Mildew Downy Mildew
Cucumber Tunnel	65	85	45	150	16	40	3 per m ²	Red Spidermite Aphids Whitefly	<i>Fm</i> Powdery Mildew Downy Mildew
Eggplant	75	90	50	75	27	220	0.15	Thrips Aphids	Powdery Mildew
Gem Squash Semi-bush	50	70	35	150	18-22	10-12	4	Pumpkin Fly	Powdery Mildew
Gem Squash Vine	55	80	50	150	14	10-12	2	Aphids	Virus Diseases
Hubbard Squash	110	130	100	150	7	6	1.5	Pumpkin Fly Aphids	Powdery Mildew
Lettuce	50	70	30	60	55	800-1000	0.05-0.07	Aphids Leafminer	Powdery Mildew Bacterial Rot
Marrows	35	55	40	150	18	8-10	2.5	Fruit Fly Whitefly	Virus Diseases Powdery Mildew
Melon	85	100	40	150	16	20	1	Fruit Fly	Anthracnose Fusarium Root Rot
Onions	170	190	8*	20	850-1000	250	3.5	Thrips	White Bulb Rot Pink Root Rot <i>ta</i>
Peppers	70	85	2x40*	150	30-35	150	0.25	Aphids Thrips	Virus Diseases Phytophthora Root Rot
Pumpkin Semi-bush	90	120	80	180	8	4	2	Pumpkin Fly Cutworm	Powdery Mildew Fruit Rots
Pumpkin Vine	120	140	100	180	5	4	1.5	Pumpkin Fly Cutworm	Powdery Mildew Fruit Rots
Sweet corn	75	100	20	90	55	8	8	Stalk Borer Bollworm	Rust NCLB
Swiss chard	60	75	20*	45	200	60	4-6	Aphids	<i>Ccpa</i>
Tomato	80	100	40	150	16	250	0.1	Bollworm Whitefly Nematodes	Blight Bacterial Wilt Viruses
Watermelon	80	90	50	180	6	20	0.3	Fruit Fly	Gummy Stem Blight Anthracnose