

# BUTTERNUT

## **Production & Spray Guide**



### **Squashes Production Guide**

"Integrated Crop Solution"

#### Soil requirements

Butternuts prefer well drained sandy loam to loam soils with a high calcium content. Butternuts like growing in soils with a PH value of between 5.5 to 6.3. If less than 5.5 agricultural lime should be applied in accordance with soil analysis results. Low PH soils have Molybdenum and Calcium deficiencies which reduce the keeping quality of the fruits. Soil temperatures are important for good germination. Germination takes up to 3 weeks in soil temperatures between 10°C and 13°C, which makes the growth and management of the crop difficult. Soil temperatures around 15°C will result in good germination of around 7 days. 20°C gives maximum root development and even crops. Fields need to be prepared either by ploughing or rip and disc. If direct seeding, soil should be worked to a good tilth without too many big clods. It should be as level as possible to ensure even plant emergence, so irrigation or rainfall cannot form puddles. Be careful of crusting at emergence a light irrigation may be necessary.

#### **Climatic conditions**

Butternuts are far less sensitive to unfavourable growing conditions than most other cucurbits. Butternuts prefer a warm dry climate and best growing conditions are when the temperature is between 20°C - 25°C with a maximum of 32°C, night temperatures not lower than 10°C. At higher temperature range as indicated female flowers can abort and young fruit can wilt and shrivel. There is a tendency for plants to produce less female flowers with high temperatures and long days.

#### Planting time

For advice on varieties for seasons and the market place contact a Prime Seed Agronomist for his recommendations. Butternuts can be planted as soon as the risk of frost is over and temperatures are between the ranges stated earlier. Timing is important when planting so crops can mature before the hot humid summer rainfall conditions form as this can result in serious leaf disease problems. Aphids are usually a problem also at this time and can spread virus diseases very quickly. Direct seeding makes the germinating seed susceptible to attack by pathogens such as Fuserium and Rhizoctonia. Also rats and mice are a huge problem as they dig up and eat the germinating seed. Baiting with rat poison for these pests is most important to avoid heavy seed losses. A recommendation is for F1 hybrid seeds to be raised in a recognised nursery like Prime Plants Nursery because of the high cost of the seed. By doing speedlings early while soil temperatures warm up the crop will be 2 - 3 weeks earlier than if direct seeded. Depth for direct planting of seed is 25 - 30mm, for speedlings just cover to level of the top of the plug. Make sure good plug to soil contact is achieved to ensure rapid take off of seedlings in the fertilized enriched soil.



#### Spacing

This depends on the cultivar, if it is a semi bush or vine type, the market place and the irrigation system to be used. With overhead irrigation a single row 1.5m to 1.8m between rows and plants 0.5m to 0.8m in row. This gives a population of approximately 11,000 – 16,000 plants per hectare. Semi bush types can be planted in double rows 0.5m- 0.6m apart with plants 0.5m apart in row and 1.5m to 1.8m between the double rows. This gives 16,700 – 20,000 plants per hectare. This can help with weed control and gives smaller fruits where this is desirable for the market place.

#### Irrigation

As the butternut plant is of desert origin it has a determined root system. Butternut plants have a deep tap root to utilise water deep down in the soil whereas the shallow fibrous root system draws the water just below the surface. Butternuts irrigated by overhead sprinklers have root systems which spread at much the same rate as the vines on the surface. Drip irrigation makes an "Onion" shape of water in the soil and the roots are confined to the "Onion". Over irrigation with drip if incorrectly applied causes a lot of problems with Butternuts. The soil will get over saturated in the "Onion" zone depleting the oxygen level in the soil so no roots will develop there. Calcium will therefore not be easily available in over irrigated soil leading to calcium deficiency and blossom end rot. It is usually preferable to under irrigate the crop while young except at the critical stage of fruit set when the water amount should be increased. Clay soils tend to waterlog easily so let them dry out to some extent between irrigations, to allow oxygen to re enter the root zone. Sandy soils require more regular irrigation to keep the soil moist. Loam to clay loam soils need only to be watered every second day.

#### Fertilization

For a good crop of Butternuts the plant will require some

200kg N: 50kg P: 500kg K, 120kg Ca and 70kg Mg per hectare. A guide is to use 600/800kgs compound

"D" per hectare. 3 top dressings of 75kg per hectare AN at 3-5-7 weeks. All cucurbits are sensitive to Molybdenum deficiency. Symptoms are stunted growth and overall yellowing of the leaves. If the PH is above 5.5 more Molybdenum will be available. Seedlings can be sprayed with Sodium Molybdate at 120g in 500 litres water per hectare, which should be sufficient but a second spray can be done at fruit set. Boron is essential for root hair growth through which Calcium is taken up. Boron can be sprayed on shortly before fruit set and 2 – 3 weeks later. Boron deficiency is indicated by a clear yellowish to light green rim to the leaf. Copper sprays can cause similar symptoms and stunt leaves so be careful with excess copper sprays.



Under irrigation the crop will emerge more quickly and will mature earlier when planted shallow and the seed covered by leveling the soil. Alternatively planting deeper but covering the seed with 2.5 – 5cm of soil then re-ridging two or three times during growth will produce similar

#### Pollination

Bees are the main pollinators of the Butternut crop. Bees are thought to be responsible for over 90% of its pollination. The female flower must be visited several times for efficient pollination. The use of 2 to 3 beehives per hectare is recommended.

#### Harvesting

Butternuts usually take 85 to 100 days to harvest. Before the fruits are ready for harvest the stage of ripeness should show the rind an even beige in colour, with no green ground colour or blotches, the stalk hard but not dry. There may still be green stripes at the stem end. At this stage the fruits are suitable to the local market, but the internal colour will be slightly pale and keeping quality poor. To achieve a high sugar content and a dark orange flesh leave the fruit to ripen on the vine. Once the green stripes on the fruits have almost gone, plants can be left to dry out. If irrigation continues at this stage the fruits will swell and crack. When harvesting cut the stalk 10 to 15mm above the thickened attachment to the fruit, this cut must not leave sharp edges or a point which could pierce other fruits during handling and storage.

Yields 30 to 45 tons per hectare.



# Squashes Spray Guide

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-7         0-10         10-12         42-49         49-56           8000         Acuta Stat Burton         Acuta Stat Burton         42-49         49-56           8010         Acuta Stat Burton         Acuta Stat Burton         Acuta Stat Burton         42-49         49-56           8010         Acuta Stat Burton         Acuta Stat Burton         Acuta Stat Burton         Acuta Stat Burton         42-49         49-56           8010         Acuta Stat Burton         Acuta Stat Burton         Interd State Burton         Interd StateState Burton         Interd State Burton <td< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td></td<>							
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Contract     Apron Star Seed Dress     Amistar Tap / Score       Amistar Tap / Score     Amistar Tap / Score       Bravo / Amistar Tap / Score       Below are off-labe suggestions; grower must do own tests for crop damage       Touchdown       Carmoxone / Touchdown       Below are off-labe suggestions;	Leafminer			Trigard/D	ynamec/		
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es la	Powdery Mildew				Revus/Ridomil Gold/Folio		
	Anthracnose			Bravo / Amistar Top / Score			
es es	Virus Complex			Actara Soil Drench			
es es	Weed Problems	Below are off-labe sugg	gestions; grower must do	own tests for crop damage			
Gramoxone / Touchdown es le)	Before planting - post emergence perennials	Touchdown					
	Before planting - post emergence annuals	Gramoxone / Touchdown					
	Post-emergence: grasses			Fusilade Forte			
	Nutgrass(Yellow + Purple)			Servian			





# SEED CO GROWER'S GUIDE

CROP		) MATURITY	(с	SPACING m)	PLANTS/HA	AVERAGE SEED PER	SEED REQUIREMENT	COMMON PESTS	COMMON
	WARM	COOL	IN ROW	BETWEEN	X1000	GRAM	(Kg/Ha)		DISEASES
Garden Beans	55	65	2x7 <sup>*</sup>	50	285	4-5	75	Bollworm	Rust Anthracnose Halo Blight
Beetroot	80	110	10 <sup>*</sup>	20	450	50-60	8	Aphids	Ccpa Rzoct
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 <sup>*</sup>	15	1100	800	2	Nematodes	ta
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 m²	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 <sup>*</sup>	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 <sup>*</sup>	45	200	60	4-6	Aphids	Ссра
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
	Beetroot Broccoli Broccoli Calbage Carrot Carrot Cauliflower Cauliflower Cucumber Cu	BeetrootSROBroccoli70Butternut90Cabbage80Carrot90Cauliflower85Cucumber Field60Cucumber Tunnel65Gem Squash Semi-bush50Gem Squash Squash35Marrows35Marrows35Melon85Onions110Peppers70Pumpkin Semi-bush90Sweet corn75Swiss chard60Tomato80	Beetroot80110Broccoli7090Butternut90120Cabbage80110Carrot90120Cauliflower85110Cucumber Field6085Cucumber Tunnel6585Eggplant7590Gem Squash Semi-bush5070Gem Squash Squash5070Gem Squash Squash5070Marrows3555Melon85100Onions170190Peppers7085Pumpkin Vine90120Sweet corn75100Swiss chard6075Swiss chard6075Natoro88100Swiss chard6075Swiss chard60	Beetroot         80         110 $10^*$ Broccoli         70         90         40           Butternut         90         120         50           Cabbage         80         110         40           Carrot         90         120 $3^*$ Cauliflower         85         110         40           Cucumber Field         60         85         40           Cucumber Field         65         85         45           Gem Squash Semi-bush         50         70         35           Gem Squash Semi-bush         55         80         50           Marrows         35         55         40           Marrows         35         55         40           Melon         85         100         8           Pumpkin         90         120         80	Beetroot         80         110         10.**         20           Broccoli         70         90         40         70           Butternut         90         120         50         100           Cabbage         80         110         40         50           Cauliflower         90         120         3*         15           Cauliflower         85         110         40         70           Cucumber         60         85         40         150           Cucumber         65         85         45         150           Gem Squash         50         70         35         150           Gem Squash         55         80         50         75           Gem Squash         55         80         50         150           Hubbard         110         130         100         150           Marrows         35         55         40         150           Melon         85         100         40         150           Melon         85         100         40         150           Pumpkin         90         120         80         180	Beetroot8011010°20440Broccoli7090407036Broccoli901205010020Cabbage80110405030Carrot901203*151100Cauliflower85110407036Cuumber85110407036Cuumber85110407036Cuumber65854515016Eggplant7590507527Semi-bush50703515018-22Gem Squash50703515014Hubbard1101301001507Gem Squash554015016Hubbard11013016016Marrows35554015016Marrows1701908*2030-35Peppers70852x40*15030-35Pumpkin1201401001805Swiss chard607520*45200Tomato801004015016	Beetroot8011010*20445050-60Broccoli7090407036225Butternut9012050100208-10Cabbage80110405030300Carrot901203*1501100800Carrot901203*1501100800Caulifower85110407036240Cuumber Field6585451501640Cuumber Field6585451501640Cuumber Field50703515018-2210-12Gem Squash Squash50703515018-2210-12Hubbard Squash5580501501410-12Hubbard Squash110130100150776Marrows355540150188-10Melon85100401501620Peppers70852x40*15030-35150Pumpkin Semi-bush901208018084Melon752006055830-30Swiss chard607520*4520060Swiss chard607520*4520060	BeetrootNo	Beetroot         80         110 $10^{\circ}$ 20         550         550-60         88         Aphids           Broccoli         70         90         40         70         36         225         0.2         Diamondback Moth Aphids           Butternut         90         120         50         100         200         8-10         3         Fuit Fly           Cabbage         90         120 $3^{\circ}$ 150         1100         800         0.2         Diamondback Moth Aphids           Cauliflower         83         110         40         50         30         0.2         Diamondback Moth Aphids           Cauliflower         83         110         40         70         36         240         0.2         Diamondback Moth Aphids           Cucumber         65         85         45         150         16         40         3 per m <sup>1</sup> Red Spidermite Aphids           Gem Squath         50         70         35         150         16-1         40         3 per m <sup>1</sup> Red Spidermite Aphids           Gem Squath         55         80         100         16-2         220         0.15         Thrups           Gem Squath<

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