ATLAS

F1 Hybrid Butternut Squash

OUTSTANDING QUALITIES

- **LARGE, UNIFORM FRUIT**
- **HEALTHY PRODUCTIVE PLANTS**
- **INDUSTRY STANDARD FOR PROCESSING BUTTERNUT**
- **VERY GOOD YIELD POTENTIAL**
- **RELIABILITY**

Atlas F1 hybrid is a *Cucurbita moschata* type butternut bearing large fruit with excellent fruit qualities. **Atlas** is widely adapted and the overall vigour of this variety tends to make it less susceptible to diseases. Yield potential is very good. Fruit set is excellent and covers a long bearing season. Fruit shape is similar to that of Waltham and fruit weigh between 2 000 – 3 000 g in summer. **Atlas** is also well adapted for cooler season harvests as fruit are smaller and suitable for the fresh market. Flavour is considered excellent with improved colour and high sugars. The flesh texture is very firm and the rind is very smooth. The rind colour is tan when mature. The mature fruit have an excellent shelf life. Fruit are used as traditional butternut however the superior flesh quality makes **Atlas** ideal for processing. This is the variety of choice for most processors.

SPECIAL VARIETAL REQUIREMENTS

- Do not over fertilise with nitrogen, especially close to fruit maturity
- Ideal plant population is 10 000 – 12 000 plants per hectare. **We do not recommend more than 15 000 plants per hectare**
- We do not recommend irrigation in the afternoon

CHARACTERISTIC*	ATLAS
KIND	F1 hybrid squash (*Cucurbita moschata* (Duchesne) Duchesne *ex* Poiret)
TYPE	Butternut squash
MATURITY	90 - 105 days to harvest as mature fruit
SEASON	Widely adapted for warm season production and cool season production in tropical and sub-tropical areas
PLANT TYPE	Semi-bush
FRUIT SHAPE	Cylindrical, with a bulbous blossom end
RIND COLOUR	Tan
YIELD POTENTIAL	30 - 45 t/ha
MATURE HARVEST MASS	2 000 – 3 000 g in summer
SHELF LIFE (MATURE FRUIT)	Excellent
UNIFORMITY	Good
PLANT SPACING GUIDE	1.6 m between rows, for in-row spacing see page 2
POPULATION GUIDE	Final stand of 10 000 - 12 000 plants per ha
DISEASE REACTION (SCIENTIFIC)	-
MARKETS / END USE	Processing and fresh market
SPECIAL FEATURES	Ideal for the processing market due to the large size, superior flesh quality and excellent flavour

* Characteristics given are affected by production methods such as soil type, nutrition, planting population, planting date and climatic conditions. Please read disclaimer.

Resistance: is the ability of a plant variety to restrict the growth and development of a specified pest or pathogen and/or the damage they cause when compared to susceptible plant varieties under similar environmental conditions and pest or pathogen pressure. Resistant varieties may exhibit some disease symptoms or damage under heavy pest or pathogen pressure (HR = High resistance, IR = Intermediate resistance).

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P.B.R.

GENERAL TIPS FOR BUTTERNUT PRODUCTION

Fruit set
Yield is dependent on the early production of a large number of flowers and the early fertilisation of a large percentage of female flowers. The dehiscence or splitting of pollen sacks to release pollen is dependent on temperature.

Air temperature	Pollination (Fruit set)
< 8 ºC	No pollen dehiscence
8.9 – 10 ºC	Minimum temperature for pollen sack splitting. Bee activity severely reduced.
10 – 12.8 ºC	Optimal temperature for pollen sack dehiscence

These temperatures should be reached during the diurnal swing and are very important for successful pollination. In other words, if you were planning to establish your crop and you expect temperatures not to reach the critical 10 - 12.8 ^{o}C, you should expect lower than normal yields. Successful pollination is essential for fruit set. Bees should visit a flower at least 30 times to ensure sufficient pollination for normal fruit development. Inadequate pollination may lead to the production of lopsided, poorly shaped fruit or fruit abortion. It is necessary to ensure that you have an adequate amount of bees for pollination.

Bee activity is also affected by environmental factors. It is important to take into account that butternut flowers generally open at daybreak and chances of pollination after noon are poor. Bees are sensitive to temperature and humidity. Flying is severely reduced when temperatures are below 9 ^{0}C or when humidity is very low. Pollen will dehydrate if the humidity is low and temperatures high. Bees will also not visit the flowers under these conditions. With butternuts, pollination is most effective prior to 9 am. It is therefore important to plan planting times to avoid low temperatures in the early morning.

Thinning and normal abscission of blossoms and fruit
Producers should be able to distinguish between normal and excessive blossom abscission (abortion). According to research on common cucurbits, it appears that only about 20 % of all female flowers formed, eventually bear mature fruit. It is therefore normal for as much as 80 % of the female flowers to abscise. In butternuts the development of a fruit on a vine has an inhibitory effect on the development of additional fruit on the same vine. The producer can take advantage of this phenomenon by removing all poorly developed and damaged fruit at an early stage. Normal fruit can then set in its place.

Plant spacing guide: Distance between plants in the row.

Between row spacing	Plant population		
	10 000	12 000	15 000
1.0 m	100 cm	83 cm	66 cm
1.6 m	6255 cm	52 cm	4237 cm

Fruit cracking
All squash fruit have the potential to crack, with some varieties more susceptible than others. Thin rind and high sugar content both predispose butternuts to cracking. Cold air and warm soil temperatures increase the tendency of cracking. Cracking under these conditions is a result of the equilibrium of water in the plant being governed by root uptake of water and leaf transpiration of excess water. Warm soil enhances water uptake and cool air retards transpiration. Under these conditions water builds up in the plant. Butternuts with a high sugar level have a higher osmotic potential than fruit with lower sugar levels. Since water travels through the plant from a low to a high osmotic potential and fruit usually has a relatively high osmotic potential, the water is forced into the fruit. If the fruit has an even higher osmotic potential than usual, the water will move with an even greater force. The amount of water that gathers in the fruit cells causes them to swell to such an extent that the fruit may crack; this pressure may be as high as 50 bars.

Another important factor for cracking in butternuts is prolonged keeping of mature fruit on the vine. If the fruit are kept on the plant until the plants senesce, the plant will naturally force as much carbohydrates and nutrients into the fruit as possible. This will also cause the fruit to have a higher osmotic potential, forcing more water into the fruit. Therefore it is advisable to, as soon as the first fruit are maturing, to go through the field and cut mature fruit from the vine. The fruit can be left on the field until all fruit are ready to harvest. This will also be beneficial for immature fruit on the plant. Over fertilisation with Nitrogen may also lead to fruit cracking.

Susceptibility definition:
Susceptibility (S) is the inability of a plant variety to restrict the growth and development of a specified pest or pathogen.

Tolerance definition:
Tolerance (T) is the ability of a plant variety to endure **abiotic stress** without serious consequences for growth, appearance and yield. Vegetable companies will continue to use tolerance for abiotic stress

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