



**STARKE
AYRES®**



CAULIFLOWER

PRODUCTION GUIDELINE

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SEEDS OF SUCCESS

CAULIFLOWER

1.1 HISTORY AND BACKGROUND

Cauliflower is a good source of carbohydrates and vitamins B, C and potassium, and has been cultivated for thousands of years in the Middle East and Europe. *Brassica oleracea* var. *botrytis*, commonly known as cauliflower, is a variety of *Brassica* in which flowers have begun to form, but have stopped growing at the bud stage. It is at this bud or head stage that the product is harvested and then consumed

2. ADAPTABILITY

2.1 CLIMATIC REQUIREMENTS

Cauliflowers are more sensitive to extremes in heat and cold, than cabbage.

- Optimum soil germination temperature 25 °C
- Air temperature: 15-18 °C
- Optimum temperature for head formation: 20-25 °C
- Soil temperature: 7-29 °C

2.2 SOIL REQUIREMENTS

Well drained loamy soil with a rooting depth of 450-600mm, and pH 6-6.8 is recommended.

2.3 PRODUCT TYPES

The most popular cauliflower types are the white heading cultivars. The consumer preference is for white heads or curds. As a result more attention is being given to the selection or breeding of varieties with wrapper leaves that protect and cover the curd from sunlight for as long as possible. Exposure to light causes the curds to yellow and lose their white colour.

Other types that have been bred for niche markets include cultivars that produce purple, gold and green curds. The white heading cultivars however are by far the most popular around the globe.

2.3.1 VARIETY CHOICE

Starke Ayres have an extensive range of cultivars for harvesting at different times of the year. Specific cultivars have been bred for winter, summer, autumn and spring production as well as cultivars that have the ability in certain areas to be grown throughout the year. The promotion of flowering (or curd formation, in the case of cauliflowers) by exposure of a plant to low temperatures is known as vernalisation. Depending on the cultivar, curd initiation may or may not be dependant on vernalisation, therefore it is important for the grower to plant a cultivar/cultivars suited to a particular planting slot.

The choice as far as the type of cultivar to plant is dependant on several factors. First the market requirements must be determined, in terms of preference toward a particular type of cauliflower and the choice should be made based on this. Additionally the variety chosen must be adapted to the environmental and climatic conditions of the area in which production will take place.

More information regarding the cultivar range can be obtained from the Starke Ayres website, www.starkeayres.co.za or contact your nearest sales representative for the latest information or for assistance in cultivar recommendations.

3. CULTIVATION PRACTICES

3.1 SOIL PREPARATION

The soil should be prepared thoroughly and deeply before planting. The soil (if necessary) should first be ripped and then ploughed and disced.

3.2 PLANTING PERIODS

Depending on the variety and region, cauliflowers can be grown throughout the year. On the Highveld the crop should not be sown between May and July because of the low temperature. Cauliflowers are generally transplanted as seedlings. Healthy one month old seedlings are recommended for transplanting purposes.

3.3 SEEDLING PRODUCTION

Seedlings should be grown in a well-aerated medium, which has good water holding capacity and at a pH of around 6.5. Generally, peat, bark and vermiculite mixes are used. Media problems typically include excessive tannins and low air filled porosity, which results in poor drainage and the buildup of green mould. The medium should be pre-enriched and the seedlings should be fertilized. For optimum germination, the seedling trays should be placed in a germination chamber, at 20 °C with high relative humidity. The seedlings should be moved to the tunnel at the first sign of germination. The ideal temperature for seedling cultivation is 20 °C.

Seedling management is a critical factor in cauliflower production, as the following factors related to seedling production may result in physiological disorders:

- Incorrect sowing time.
- Cold temperatures, particularly below 7 °C.
- Cold grown seedlings.
- Over-fertilization of seedlings.
- Oversized seedlings at transplant.
- Temperature differences between the seedling nursery and the farm.

A precision seeder is recommended to place single seedlings at a uniform depth.

3.4 PLANT POPULATION AND SPACING

A general spacing of between 28 000 and 35 000 plants per hectare is recommended.

3.4.1 TRANSPLANTING SEEDLINGS

The following points should be kept in mind when transplanting cauliflower seedlings.

Firstly the seedlings must be transplanted and watered as soon as possible after delivery from the nursery. Ideally seedling should be transplanted 5 weeks after sowing. Secondly the seedlings should be placed vertically into the ground and not sideways. This is to avoid a condition known as "J rooting". This condition results in a J shaped root system that ultimately decreases yield and head size. Thirdly the grower should ensure that seedlings are planted at the correct depth in a little hole that has been made in the ground prior to planting. If the seedlings are forced into the ground without this planting hole, the root system will be damaged and the plant will experience stress resulting in poor yield. Once the seedling is placed inside the hole the area should be firmed so that sufficient contact is made between the seedling and the soil.

When planting seedlings a choice can be made between the square method and the staggered method of planting. The staggered method is more advantageous as there is less competition between plants compared to the square method where plants are directly opposite each other, thus maximizing competition. See Figures 1 and 2 below.

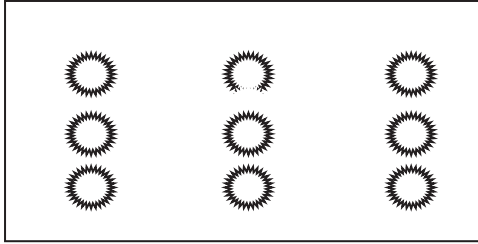


Figure 1: Square planting method.

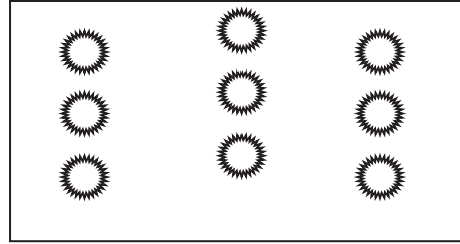


Figure 2: Staggered planting method.

3.5 FERTILIZATION

The soil is a resource that needs to be managed and monitored meticulously. It is essential that the soil samples of the intended growing area are analysed by an accredited laboratory to determine the nutrient status of the soil. Based on soil analysis results a fertilization programme can then be developed. This programme is obviously specific for the type of soil that was sampled and subsequently analysed. This exercise should be done every season or every time a new crop is planted on the land.

In addition to having soil samples tested, the water quality should be analysed because water quality can have a direct effect on the growth of the plant. For example, irrigation water with high calcium levels can increase the soil pH.

Being a heavy feeder, cauliflowers require fertile soils. Soils must be fertilized according to soil analysis results.

3.5.1 FERTILIZATION GUIDELINE

General recommendations:

- N - 200-240kg/ha. 60-80kg/ha at pre-plant. Top dress balance at 7, 14, 21 & 28 days after transplant
- P - 50-60kg/ha
- K - 250kg/ha

3.6 IRRIGATION

Total water requirement is approximately 440mm.

As a general guideline apply 10 to 15 mm per week for the first third to half of the growing season, and about 25 mm per week thereafter for winter production. Corresponding figures during summer would be 20 to 25 mm and 40 to 50 mm, respectively.

4. HARVESTING AND MARKETING

Cut cauliflower curds before they are too big at the appropriate harvest time for the cultivar. Curds can be pre-packed in a punnet or sold loose for the fresh market. Store in a cool dry place (preferably refrigerated), to reduce the effects of field heat after harvesting. The ideal is to have a high first cut percentage, (80% +) this can be achieved through good management and choosing a cultivar that produces uniform heads. If the cultivar does not mature uniformly it adds further costs as irrigation and labour continues for every cut after the first cut.

INDEMNITY

All technical advice and/or production guidelines given by STARKE AYRES or any of its personnel with reference to the use of its products, is based on the company's best judgement. However, it must be expressly understood that STARKE AYRES does not assume responsibility for any advice given or for the results obtained.

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