



**STARKE  
AYRES®**



# CABBAGE

## PRODUCTION GUIDELINE

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**SEEDS OF SUCCESS**

# CABBAGE

## 1.1 HISTORY AND BACKGROUND

Cabbage (*Brassica oleracea* var. *capitata* L.) has its origins in Europe and has been grown extensively for over 2,500 years as a vegetable food crop. It is a very versatile crop and can be eaten raw, cooked, boiled and stuffed. Cabbages are a highly nutritious food source and contain a high amount of vitamins and minerals; they are particularly abundant in Vitamin C content.

## 2. ADAPTABILITY

### 2.1 CLIMATIC REQUIREMENTS

The cabbage is generally considered to be a cool weather crop and germinates at a minimum soil temperature of 4°C and at an optimum temperature of between 18° C and 35° C. The optimum temperature for growth is approximately 18° C with an average maximum of 24° C and an average minimum of 4.5° C. The crop is also generally frost resistant.

### 2.2 SOIL REQUIREMENTS

Well drained loamy soils with an effective rooting depth of approximately 600mm is recommended

#### 2.3.1 VARIETY CHOICE

Starke Ayres provides the grower with several high quality cultivars of cabbage. Cultivars differ with respect to size, shape and maturity dates, as well as adaptability and disease resistances. More information regarding the cultivar range can be obtained from the Starke Ayres website, [www.starkeayres.co.za](http://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, cabbages can be grown throughout the year. On the Highveld the crop should not be sown between May and July because of the low temperature. Cabbages 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. Medium problems typically include excessive tannins and low air filled porosity, which results in poor drainage and the build up 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 cabbage production, as the following factors related to seedling production may result in physiological disorders in cabbage:

- 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.

### 3.4 PLANT POPULATION AND SPACING

It is recommended that 26 – 30 000 plants/ha is planted for the loose head market. Higher plant populations raise the average yield per hectare, but the heads are smaller. For the bagging or chain-store / pre-pack market a density of 35- 45 000 plants/ ha is recommended. However it must be noted that the population of a cabbage field per hectare for a commercial grower can vary and planting is dependant on what the specific market needs and available resources are. The following guidelines explain the recommended spacing and requirements for the various markets.

- LOOSE HEAD - / HAWKER MARKET
  - Head size, weight & hold-ability are important features.
  - Plant density of ± 26 – 30 000 plants / ha.
  - Plant spacing of 60 - 70cm X 60cm.
- BAGGING - / CHAIN-STORE - / PRE-PACK MARKET
  - Quality, uniformly filled heads, firmness and colour are important.
  - Yield per hectare and uniform cut.
  - Plant density of 35 – 45 000 plants / ha.
  - Plant spacing of 45 – 55cm X 60cm.

For baby cabbage, varieties have a smaller head size and the population can be increased. A plant spacing of 25cm (in row) X 25 cm can be used as a guideline.

#### 3.4.1 TRANSPLANTING SEEDLINGS

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

Firstly the seedlings must be transplanted and watered as soon as possible after delivery from the nursery. Ideally seedlings should be transplanted 5 weeks after sowing. Secondly the seedlings should be placed vertically into the ground and not side ways. 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 formed into the ground prior to planting. If the seedlings are forced into the ground, without a hole being prepared for them to be inserted into, the root system will be compromised 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 2 and 3 below.

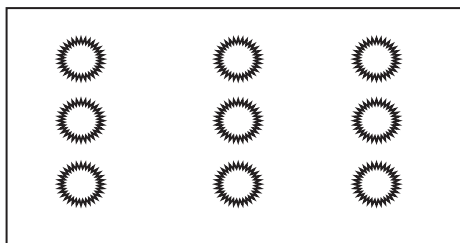


Figure 1: Square planting method.

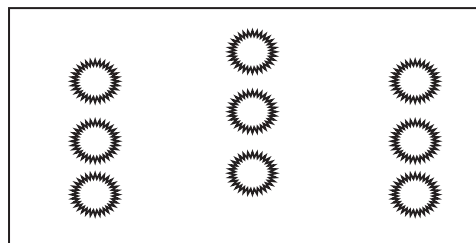


Figure 2: Staggered planting method.

### 3.5. FERTILISATION GUIDELINE

Nitrogen requirements: 180-250 kg/ha. 70 to 90kg/ha worked in the soil before planting (either as 2:3:2 or 2:3:4)

Phosphorus: 50kg/ha worked in the soil before planting

Potassium: 120-180kg/ha worked in the soil before planting

The balance side dressed as follows:

Summer: 7 days after transplant 5g per plant. And repeat on days 14 and 28.

Winter: 14 days after transplant 5g per plant. And repeat on days 28 and 45.

Soil pH: 6-6.8

Micro nutrients: Manganese, Magnesium, Boron, Molybdenum.

\* This is only a guide, soil analysis is essential.

Side dressing of fertilizers at the correct times after transplanting is done with common fertilisers such as LAN (Limestone Ammonium Nitrate). The placing of the fertilizers should be as close to the plant as possible to ensure that the young seedling utilises the nitrogen efficiently to produce the large frame needed for the production of large heads

### 3.6 IRRIGATION

Total water requirement is approximately 440mm.

In winter, 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.

In summer, apply 20 to 25 mm per week for the first third to half of the growing season and 40 to 50 mm per week thereafter.

### 4. HARVESTING

Heads are cut when they are firm. Heads for the loose head / hawker market should be cut with a few outer leaves to protect them during transportation. However as outer leaves are not required for the bagging market, the heads can be cut higher up on the stem. After harvesting, cabbage stumps should not be left in the ground as they may contribute to field contamination via pests or insects. 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.