



**STARKE
AYRES®**



LETTUCE

PRODUCTION GUIDELINE

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SEEDS OF SUCCESS

LETTUCE

1. INTRODUCTION

Lactuca sativa, commonly known as lettuce, is a member of the Asteraceae family, grown as a leaf vegetable.

1.1 HISTORY AND BACKGROUND

The origins of lettuce can be traced to the Mediterranean basin from where it spread to the rest of the world. It has been cultivated as a food source for thousands of years and is very popular as a salad ingredient all over the world. Lettuce is a very nutritious food source and generally the darker the leaf the more nutritional value it has. It is a very good source of vitamins A, K, C, folate, manganese and chromium.

2. ADAPTABILITY

2.1 CLIMATIC REQUIREMENTS

Essentially a cool weather crop, lettuce germinates at a temperature range of between 15 and 20°C. Germination may be compromised at temperatures above 25 °C. The ideal temperature range for growth is also between 15 and 20 °C. It is more challenging to grow lettuce in summer, as the disease pressure is higher than in winter and the hot conditions may induce bolting in certain cultivars. However Starke Ayres has a range of cultivars adapted for the various seasonal slots

2.2 SOIL REQUIREMENTS

Well drained loamy soils with a pH of 6-6.8 are recommended, with a rooting depth of between 450 – 600mm.

2.3 PRODUCT TYPES

There are 4 main types of lettuce:

CRISPHEAD – The most popular type of lettuce grown in South Africa. Its leaves are tightly packed together producing a firm head with crispy leaves.

BUTTERHEAD – These types of lettuce produce loose heads, with a butter texture with soft waxy leaves and a mild flavour.

LOOSELEAF - This type of lettuce does not form heads, the leaves are joined at the stem. Varieties include: oak leaf, lolla rosa, lolla bionda, Multi-leaf and green leaf.

ROMAINE OR COS - This type of lettuce has a more upright or oval head shape with dark outer leaves with a crispy texture. Considered to be more nutritious than Crisphead lettuce.

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

Cultivars are available for various planting/harvesting slots throughout the year. Starke Ayres have an extensive range. 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.

3.3 SEEDLING PRODUCTION

Generally seedlings are made by sowing seeds in seed trays (200 cavity trays). Seeds should be sown at a depth of between 0.6cm and 1.3 cm. Germination may be compromised at temperatures above 25 °C. The optimal temperature for germination is 20 °C.

Lettuce is essentially a temperate crop and is sensitive to temperature fluctuations. This is especially important for the germination of lettuce seed which may experience thermodormancy in hot summer conditions. Lettuce seed may enter a state of dormancy and consequently fail to germinate at high temperatures. Dormancy occurs when seed is exposed to high temperatures while it imbibes (absorbs) water. Thermodormancy is a condition that may be induced at temperatures above 25 °C. Some varieties are more susceptible to thermodormancy than others. For example, triple red lettuce varieties seem to be more affected by this phenomenon than other varieties.

There are several interventions that have been initiated to circumvent thermodormancy and include the following:

1. Priming. Seed priming is probably one of the most effective ways to overcome thermodormancy.
 - On request, Starke Ayres supplies primed and pelleted seed of certain cultivars.
 - Primed seed must at all times be kept in a refrigerator and used immediately after purchase as primed seed has a very limited shelf life.
2. Germinating in a germination room at correct optimal temperatures can also overcome the problem of thermodormancy.
3. Pre-watering soil – the soil cools as the water evaporates.
4. Plant early in the morning as soil temperatures will be lowest at this time.
5. If possible, keep the soil "dark damp" for about the first 6 hours.
6. Pre-chill trays or water with chilled water.

3.4 PLANT POPULATION AND SPACING

For Crisphead cultivars a population of approximately 45 000 – 60 000 plants per hectare is recommended. Higher plant densities result in smaller the head size. A larger head size usually commands a higher price.

Speciality lettuces can be grown at much higher densities than Crisphead cultivars. For open field a population of between 70 000- 80 000 plants per hectare is recommended and for hydroponics a population of 80 000-100 000+ plants.

3.4.1 TRANSPLANTING SEEDLINGS

Seedlings should be transplanted between 4 - 6 weeks after sowing. Seedlings must be transplanted at the correct depth in a little planting hole that has been made in 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 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.

4. FERTILISATION

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

In addition to having soil samples tested the grower should also have the quality of his water 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.

Fertilisation guideline (Grower must first have soil analysis done)

- 110 kg nitrogen (N), 14 kg phosphorus (P) and 190 kg potassium (K) per ha
- Care should be taken not to over-apply nitrogen

Side dressing of fertilisers at the correct times after transplanting is done with common fertilisers such as LAN (Limestone Ammonium Nitrate). The placing of the fertilisers should be as close to the plant as possible to ensure that the young seedling utilises the Nitrogen efficiently to produce a framework that would contribute to large head development. (Side dress at approximately 4 weeks).

As mentioned previously a soil analysis should be done for the area that is to be used for planting. This analysis would also reveal the pH of the soil. Generally vegetables require a slightly acidic environment in which to grow (a pH of between 6 and 6.8). Continued use of fertilisers on a piece of land generally results in acidic soils. If the pH drops below 5 the uptake of important minerals such as calcium, magnesium, potassium, molybdenum, phosphates and sulphur will be compromised. A very acidic soil could also result in the disease club root forming in cabbage.

The addition of lime can correct land that has low pH values. The correct type of lime needs to be applied. Basically the two types of lime used are calcitic or dolomitic. The ratio between calcium and magnesium in the soil would determine the choice of lime to be used.

5. IRRIGATION

Soil moisture is a very important factor, therefore it is essential that the plants are given the correct irrigation so as to avoid stress which will compromise yield. Frequent light irrigations for lettuce is recommended. Weekly water requirements are 25-30mm.

6. WEED CONTROL

Weed control is extremely important, and the land under cultivation should be cleared of weeds before planting by using the recommended herbicides. Weeds create competition and compromise yield.

DISEASES & PESTS

Major Diseases

- Botrytis
- Downy Mildew-Bremia
- Fusarium wilt
- Powdery Mildew
- Lettuce Big Vein Associated Virus
- Lettuce Mosaic Virus
- Corky Root
- Pythium
- Rhizoctonia
- Sclerotinia
- Erwinia
- Tip Burn

Major Pests

- Aphids-Nasonovia
- Cut worm
- White Fly
- Thrips
- American Bollworm

HARVESTING AND MARKETING

Crisp head lettuce is harvested when the heads are firm. When harvesting, care must be taken not to damage the wrapper leaves. The loose-leaf types are harvested when the leaves have acquired the required size. A highly perishable crop, lettuce needs to be harvested early in the day when temperatures are still cool. After harvesting store in a cool dry place and refrigerate if possible. Avoid harvesting when plants are wet or after rains as wet foliage is more conducive to rotting. Crisphead lettuce are marketed loose and packed in units of 12 in a carton for the fresh market or as pre packs in a punnet. Loose leaf lettuce are often cut and further processed as part of a prepack salad mix.

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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