

## 1. BACKGROUND

- **Origin and distribution**
- **Soil climatic and requirements**

Chicory prefers fertile, well-drained soils rich in organic matter for best growth.

Loams, silt loams and clay loam soils often out-yield the lighter textured sandy soils as the latter have lower water retention ability and the crop suffers moisture stress sooner. Heavy clay soils are unsuitable as difficulty is experienced in lifting and cleaning the roots and yields are lower.

Chicory is a cool season plant. It grows most rapidly when conditions are warm and the mean monthly temperature does not exceed 25 °C. It grows more slowly with a decrease in temperature and it is not damaged by moderate frost but severe frost kills the foliage. Long days and abundant sunlight promote rapid growth. Radicchio grows best when temperatures do not exceed 23 °C.

Water requirements depend on soil type and temperature.

Moisture is the main environmental factor affecting production. The seedling is sensitive to moisture stress and hot desiccating wind can cause severe stand reductions when the moisture content of the top 15 cm of soil is low. Once the crop has developed a root of approximately pencil thickness, it is drought tolerant as it ceases growth during periods of moisture stress. Most of the foliage may die back under severely dry conditions, but the plant recommences growth and develops new foliage as soon as soil moisture becomes favourable.

- **Uses**

In South Africa chicory is grown almost solely for



the root which after drying, roasting and milling is used for blending (mixing) with coffee.

Chicory is consumed fresh usually in salads or as a cooked potherb. Witloof has no fat, no cholesterol and is an excellent source of potassium, vitamin C, vitamin A and folate. Radicchio is low in calories it has no fat and no cholesterol. It is a good source of vitamin C and E, folate and anthocyanins.

Size "S" chicory is sold to the coffee manufacturers, while size "F" chicory is sold as stockfeed. Chicory screenings are also sold to chicory producers as a stock feed.

## 2. CULTURAL PRACTICES

- **Soil preparation**

The land should lie fallow for 2 to 4 months before planting by ploughing to a depth of about 22–86 cm and cultivate periodically with a tined or disc implement. Tillage should be done parallel to the contour banks in order to minimize water run-off and erosion.

The seedbed should be well prepared, that is, friable yet compact enough so that the seed will be placed in close contact with moist soil particles and free off trash and vegetation that would interfere with the seedling.

- **Planting**

The main factor codetermining the time of planting is the availability of moisture during the growth of the crop. Planting in the autumn allows the crop to attain the benefit of the fairly reliable autumn and spring rains coupled with a relative low evaporation rate during winter. The effect of planting time on the annual yield of wet root can be shown below:

Time of planting	Yield of wet root (kg/Morgan)
March to April	112,0
May to June	123,5
July to August	99,0
September to October	79,0

Seeded or transplanted witloof should be spaced 22,5 cm between plants in the row with rows 50 cm apart. Dense planting will reduce weed pressure. Seeded witloof may be planted 3 to 4 weeks before the last frost-free date for the growing area. Transplants should be planted shortly after the last frost-free date for the growing area.

Seeded or transplanted radicchio should be spaced 20 cm between plants in the row with rows 30 cm apart.

- **Fertilisation**

Apply ½ cup of a nitrogen-based fertiliser (21-0-0 or 34-0-0) per 3 m of row 4 weeks after transplanting or thinning. Place the fertiliser to the side of the plant and irrigate it into the soil. Avoid adding additional nitrogen after the heads begin to form. The nitrogen can be applied as 206,8 kg of limestone ammonium nitrate or 123,2 kg of urea. This top-dressing should be spread between

the rows and worked into the soil about 8 weeks after planting.

It is advisable to lime acid soils up to a pH of at least 5,5 before planting as this improves the availability of phosphorous fertiliser as well as the root yield.

#### • Irrigation

Water chicory regularly to maintain a uniform moist soil, applying 2,5 to 5 mm per week. Using organic mulch around the plant also helps to conserve soil moisture and reduce weed growth. Drought stress during growth will cause slow leaf development and bitter flavors to develop.

Conventional flood and overhead irrigation have given good results.

#### • Weed control

Closely spaced plants will help control weeds. Shallow inter-row cultivation using animal or tractor drawn cultivators coupled with hand-hoeing in the row are the usual methods of controlling weeds. Cultivate shallowly to avoid root damage and ensure uninterrupted plant growth.

Weeds can also be controlled chemically. For annual grasses and certain broad-leaved weeds, apply 6 l/ha of Benfluralin 2 to 3 weeks prior to or at planting. Do not apply after planting.

#### • Pest and disease control

*Common pests include: aphids and nematodes*

Use of insecticidal soaps, appropriate insecticides, or a strong water stream to dislodge insects can assist. Practising biological control measures will also help. Common diseases are: Fungal root rot and leaf spot.

Cultural practices that facilitate air movement will reduce disease severity. Control aphids which transmit these diseases.

#### Acknowledgements

KwaZulu-Natal Department of Agriculture and Environmental Affairs: 2001. *Vegetable production guidelines for KwaZulu-Natal*. Pietermaritzburg.

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