

### Soft scales

They are flat, motionless insects with an ellipse shaped body. They are found on the underside of leaves. They suck the sap from the leaves and stems, causing stunted growth. There are also recommended chemical in terms of Fertilizer, Farm Feeds, Agricultural Remedies and Stock Remedies Act, 1947 (Act No. 36 of 1947) which controls these scales (DAFF, Agricultural Inputs Control Directorate, 012 319 7103/7847, AICHelpdesk@daff.gov.za).

### Snout beetles

They differ between species, they can be either brown or black. They chew foliage, stems and the flower heads' bracts in terms of the Fertilizer, Farm Feeds, Agricultural Remedies and Stock Remedies Act, 1947 (Act No. 36 of 1947). Application of a full cover of recommended chemicals is also advisable (DAFF, Agricultural Inputs Control Directorate, 012 319 7103/7847, AICHelpdesk@daff.gov.za).

### 4.5.2 Diseases

Proteas suffers from a variety of diseases. The most important ones are the following:

#### Dumping off

This is the fungal diseases which attacks seedlings. This disease occurs when seedlings are transplanted densely and is caused by poor ventilation and too much water. To avoid dumping off, seedling beds should receive direct sunlight, enough spacing between seedlings for air penetration and overhead irrigation should be avoided.

#### Phytophthora root knot

This is a soil-borne disease which is caused by Phytophthora cinnamomi fungus. It infests the feeder root system and leads to stunted growth, wilting and ultimately leads to the plant collapsing.

To avoid infestation, it is important that soil preparation should be done efficiently to facilitate good drainage and overhead irrigation should also be avoided. Infested plants should be removed and destroyed as soon as they are noticed.

#### Stem and shoot canker, die back and shoot blight

*Collectotrichum* and *Drechslera fungui* cause lesions on stems, shoots and leaves. These fungi are very difficult to control since it has a wide range of hosts.

Control should best be based on preventative measures such as: sterilising seeds, growing resistant cultivars and lastly keeping plants in a healthy condition. Infected plants should be removed and burned. However, in most cases chemical control of these diseases are not effective; the following fungicides can be sprayed on infected plants:

- Mancozeb> apply 200 g/100 litres of water
- Chlorothalonil> apply 275 ml/100 litres of water

### Scab

The Elsinoë fungus causes lesions on leaves, shoots and flowering branches. Lesions are initially grey or brown, round or irregular on mature leaves. Overhead irrigation and wet climatic conditions when the plant is actively growing encourages scab infestation.

Registered fungicides should be applied before the symptoms are noticed. For young trees, the best time for such application is when they are on growth flush, while mature trees should be sprayed when new flush is expected. Fungicides for controlling canker and blight can also used against scab.

### 5. Uses

Proteas are primarily grown for their beautiful cut-flowers which are sold either fresh or dried. Cut-flowers are also sold locally and receive a good price on international markets. Home gardeners and landscapers grow proteas to decorate their gardens.

### 6. References

LEWIS, M. and BATEMAN D. 1993. *The Protea Growers Handbook*. Cornell University-New York, Ithaca, USA. Bok Books International Publisher page 34

MALAN, G. 2012. *Protea Cultivation: from Concept to Carton*. 1st Ed 2012. SUN Media, Stellenbosch-Western Cape Province, South Africa

NEVILLE, B., KOTZE, D. and BOTHA, P. 1998. *A guide to the propagation and cultivation of some South African Proteaceae* page 11

REINTEN, E. 2007. *Protea cultivation article*. Elsenburg/ARC Fynbos Unit, Stellenbosch-Western Cape Province, South Africa

TONY, R., PATERSON-JONES, C. and DU PLESSIS E. 1995. *A field guide to the Proteas of Southern Africa*. Fernwood Press in association with The National Botanical Institute, Vlaeberg-Western Cape Province, South Africa



# Protea brochure

Further information can be obtained from:

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Private bag x 250

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Department:  
Agriculture, Forestry and Fisheries  
REPUBLIC OF SOUTH AFRICA

## 1. Classification

Kingdom:	Plantae
Family:	Proteaceae
Genus:	Protea
Common names:	Protea, Sugarbushes (English), Suikerbos (Afrikaans), IsiQalaba (Zulu, Xhosa)

## 2. Origin and distribution

Most of Proteaceae family members originate from South Africa and Australia. However, this family is widely distributed throughout the Southern Hemisphere with few species found in tropical Africa, tropical America, New Zealand, Pacific Island and Malaysia.

South Africa has about 330 species in 14 genera, all of which are endemic to Africa, and none of them grows wild anywhere else in the world. A large number of proteas grow principally in the mountains which curve around the coastline of South Africa, spreading in a rough crescent from Clanwilliam township to the area nearby Port Elizabeth, with highest concentration in the Tulbagh area, Cape Peninsula, Caledon and Knysna.

Relatively few proteas also grow in the eastern mountain ranges, extending northwards into KwaZulu-Natal and Mpumalanga Provinces.

## 3. Climatic and soil requirements

Proteas which are native to South Africa grow exceptionally well in local climates. Mild climates with low humidity are generally preferred by many protea species. Humidity should never be greater than 80% for more than a week.

### 3.1 Temperature

The general recommended temperature is a mean minimum temperature of 7,2 °C to a mean maximum temperature of 27,6 °C. The average daily temperature should vary from 7 °C to 24 °C and the average daily temperature for the coldest months should be 12 °C while average daily temperature for the hottest months should be 31 °C. The absolute minimum should be -6 °C and a maximum of 44,6 °C

### 3.2 Rainfall

Most protea species requires copious amount of water throughout the year. The minimum water requirement for protea is equivalent to 700 mm of rain per year. Some protea species can still survive in areas which receive as little as 300 mm of rainfall annually, however, the area's soil drainage need to be good. Additional water application through irrigation is highly recommended to produce high cut-flower yields. Good quality irrigation water will also help in keeping the pH low and washing away the salts which accumulate in the upper soil profile.

Ideal water amounts should have high electrical resistance with low pH (except for alkaline-tolerant species such as *P.neriifolia*) with an electric conductivity (EC). Protea species are sensitive to high salt levels in water. It is ideal to use water with a chloride content of not more than 220 parts per

million (ppm). Apart from rain water, other sources include rivers, boreholes and on-farm dams. Water from dams should be frequently monitored for Phythophthora cinnamomi fungus which is fatal to protea.

### 3.3 Soil

The majority of species and cultivars require deep, well-drained sand, acidic soils with a pH of 5,5 to 7,0 for optimum growth and production. Some protea species grow naturally on soil with a pH higher than 7,0. Most acid-tolerant species will also grow well at a pH of less than 3, while this pH will be deadly for species which grow in limestone rock along the South coast of the Cape. Soil with high clay percentage is not ideal, but sandy loam soil with 6% clay is suitable. Humus containing soils have proven to be very beneficial; however, excessive humus impedes drainage and will suppress root growth. Soil tests/analysis is recommended to be conducted to assess the availability of nutrients and levels of pH in the soil.

## 4. Cultural practices

### 4.1 Propagation

Protea species can be propagated either by means of seed or vegetatively by using cuttings. No cuttings may be harvested from plants that show any symptoms of disease. Propagation by cuttings would ensure that the flowers would be uniform in type.

### 4.2 Planting

The best time to sow seed is from late summer to late autumn. Seed are best sown in seedbeds than in plastic bag and containers. The seed should not be broadcasted on seedbeds but rather sparsely sown to a spacing of at least 4 cm apart. Sowing depths depends on the particular species being sown.

The best time to plant cuttings is also from late summer to late autumn. Soft cuttings of about 15 to 20 cm should be taken from the existing fresh matured Protea plants. Only the leaves from the upper end of cuttings should remain and the rest must be removed. Under normal conditions, cuttings should be ready for transplanting after two to three months when they are about 100 to 200 mm high.

### 4.3 Fertilisation

The recommended fertilisers for the proteas are nitrogen and potassium. Nitrogen should be applied in the form of ammonium (NH<sub>4</sub><sup>+</sup>) and about 50 kg of ammonium sulphate per hectare should be applied at three separate applications times. The first application should be applied before the start of the active growth period and the other two applications should be applied every second month (eight week intervals). Protea requires very little phosphorus for normal growth and it could even cause toxic effects if applied in large quantities. Water-soluble phosphate fertiliser is applied in form of Monoammonium phosphate (MAP).

As in case of phosphorus, it has been found that protea requires little potassium for normal growth. Most soils in South Africa contain sufficient potassium for protea. If, however, soil analysis shows a very low potassium level (less than 20 mg/kg), an application of 50 kg potassium chloride/ha per year may be applied. It should be applied in the form of potassium nitrate. Potassium fertiliser must be

applied before the active growth period just like in case of nitrogen and phosphorus, or during rainy season (December to February) under dryland conditions to ensure that the fertiliser dissolves and filters into the soil. Potassium fertiliser can also be applied during winter rainfall season (May–July) under winter rainfall areas (Western and Northern Cape) to insure fertiliser dissolves and filters into the soil.

### 4.4 Weed control

The best time to control weeds is when doing soil preparation; during this time most troubling weeds such as kikuyu can be effectively controlled. Post emergence herbicides can be used for weeds that emerge after the crop has been planted but great care should be taken when using herbicides to avoid contamination. Using registered chemicals in terms of the Fertilizer, Farm Feeds, Agricultural Remedies and Stock Remedies Act, 1947 (Act No. 36 of 1947) is recommended for the control of weeds (DAFF, Agricultural Inputs Control Directorate, 012 319 7103/7847, AICHelpdesk@daff.gov.za).

### 4.5 Pests and disease control

#### 4.5.1 Pests

##### *Mite-Witches' broom*

These are very tiny mites with two pairs of legs. They feed on the stem bud, causing the bud to develop abnormally. There are no registered chemicals to control these pests. Malformed growth should be removed and destroyed.

##### *Flower head borer/ Protea Scarlet butterfly*

These are butterflies with dark brown or black lines on their fore-wings. They make holes in both flowers and florets. They also bore into the flower bud, causing flower malformation. There are also no registered chemicals for these pests but closing buds with a nylon stocking or removing eggs by hand from the flower buds could help.

##### *Black moth*

They are black in colour with 20 mm wingspan. They tunnel into the inflorescence and also damage developing seeds. The use of registered chemicals in terms of Fertilizer, Farm Feeds, Agricultural Remedies and Stock Remedies Act, 1947 (Act No. 36 of 1947) is recommended for controlling Black moth (DAFF, Agricultural Inputs Control Directorate, 012 319 7103/7847, AICHelpdesk@daff.gov.za).

##### *Blotch leaf minor*

They are tiny moths of about 5 mm long which feed on the leaves, causing batches to die off and later small holes appear on batches. It is advisable to apply a full cover of the recommended chemicals when the pest is observed, according to the Fertilizer, Farm Feeds, Agricultural Remedies and Stock Remedies Act, 1947 (Act No. 36 of 1947) (DAFF, Agricultural Inputs Control Directorate, 012 319 7103/7847, AICHelpdesk@daff.gov.za).