# Propagation and Cultivation of South African Restios

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**The Restionaceae is a family of evergreen rush-like plants. Three hundred species are endemic to the Cape floral region. Plants from this family have long attracted the attention of horticulturists around the world on account of their sculptural form and their attractive long-lasting seed heads. Restios have potential as bedding plants, as accent plants in landscaping, and their foliage is also of value to the cut flower industry. However, for many years only a few species were in cultivation and available commercially due to the extremely poor germination obtained in most species. The recent discovery that plant-derived smoke is the germination cue for many species has led to a wider range of species becoming available for cultivation. The main requirements for the successful cultivation of restios are a position in full sun, a well drained soil, and plenty of air movement.**

## INTRODUCTION

The Restionaceae, a family of evergreen rush-like plants, is one of the three major families defining fynbos, the characteristic vegetation type of the Cape floral region. During the last 10 years plants of the Restionaceae have attracted considerable interest from gardeners around the world and Kirstenbosch Botanic Garden has been working to introduce a range of restios to the gardening public. Restios do not produce the striking flowers found in the protea and erica families but have been sought after for their sculptural form and attractive long-lasting seed heads. Restios are generally tufted, reedy-looking plants which vary in height from about 20 cm to well over 3 m and can be used singly as accent plants or in groups as foliage plants. Some of the species are also used as foliage for the cut flower industry and the thatching reed, *Thamnochortus insignis*, supports a flourishing thatching industry. Some restios have large grass-like panicles of golden-brown inflorescences and most restios have dark brown seed heads. Apart from their form, the most attractive feature of the restios are the beautiful papery bracts which vary in colour from pale gold to orange-red, brown, and ebony. Members of the Restionaceae family are largely confined to the Southern Hemisphere. There are approximately 320 species in Africa, about 100 in Australia, three in New Zealand, one in Malaysia and southeast Asia, and one in Chile. In Africa about 300 species are endemic to the Cape floral region and a few species occur further north in South Africa, with one species reaching Zaire and one occurring in Madagascar.

## PROPAGATION

**Vegetative Propagation.** Restios can be propagated by seed or vegetatively by division. The stoloniferous species can be successfully divided just before the crop of new shoots emerges from the ground, generally in early or mid winter. The plants

should be divided into fairly large pieces, the roots disturbed as little as possible, and planted out immediately in open ground or in containers. After transplanting the plants should be kept well watered until the new shoots are growing and the plant has "taken". Generally the plants take up to a year to start growing again and do not seem to grow as vigorously as plants raised from seed.

**Propagation from Seed.** Restios are wind pollinated and many flower during spring or late summer, producing seed after a period of 6 to 11 months. The seed varies from very fine seed, such as *Chondropetalum tectorum* with about 10,000 seeds per gram, to the large nut-like seeds of *Ceratocaryum argenteum* which are 10 mm in diameter. Seed collection is fraught with difficulties as there is very little information available for individual species on the season of flowering, on the period required for seed maturation, and on the timing of seed drop. Seeds of many species look ripe from the outside but on dissection are found to be green and immature.

**How to Germinate Restio Seed.** Seeds may be sown in trays using a sowing medium consisting of loam, milled bark, and industrial sand (1 : 2 : 2, by volume) and should be covered with a thin layer of milled bark. Seeds of most species are dormant and will give poor germination unless dormancy is broken by treatment with smoke derived from burning plant material. Seeds may be smoke treated in a smoke tent for 30 min after sowing in trays. Alternatively, seeds may be pre-treated by soaking them in Kirstenbosch Smoke-Plus seed primer for 24 h prior to sowing. The seed primer contains smoke derivatives which break seed dormancy and maximize germination. Under natural condition seeds germinate in the autumn and early winter after a fire when soil temperatures fluctuate considerably. Temperatures of approximately 20 to 25C (day) and 8 to 10C (night) are ideal. Seed trays housed in an open shade house in the autumn should obtain sufficient diurnal temperature fluctuation for germination to occur. Seeds take 4 to 6 weeks to germinate. Seedlings should be transferred to small individual containers and grown in the nursery until they reach a size suitable for planting out in the open ground. The germination response of Restionaceae species to plant-derived smoke is shown in Table 1.

## CULTIVATION

**How to Grow and Maintain Restios.** The normal growing season for restios is in the autumn, spring, and early summer. The best time to plant restios in both the summer and winter rainfall areas is at the beginning of the rainy season. The plants are planted in holes of 600 mm square and 400 to 600 mm deep. The soil which is removed from the planting hole should be well mixed with about two spades of compost and then replaced in the planting hole. It is recommended that no fertilizer should be added as this might burn the roots. The plants should be planted at the same level as they were in the bags. Like most other fynbos plants, restios will benefit from a mulch of milled pine bark or rough compost. They must be well watered after planting and after about 6 weeks they should show signs of new growth. Restios, in common with other fynbos species like proteas, do not like to have their roots disturbed and do not like to be planted in small holes in lawns. They are, however, much more robust growers than most fynbos plants and do not seem to be plagued by soil-born fungi or other diseases. The main requirements for successfully growing restios are full sun, a well drained soil, and plenty of air movement. Restios

**Table 1.** Germination response of Restionaceae species to plant-derived smoke.

| | |
|---|---|
| *Askidiosperma andreanum* | ** |
| *A. esterhuyseniae* | * |
| *A. paniculata* | * |
| *Calopsis paniculata* | * |
| *Cannomois parviflora* | NR |
| *C. virgata* | ** |
| *Chondropetalum ebracteatum* | ** |
| *C. hookerianum* | *** |
| *C. mucronatum* | *** |
| *C. tectorum* | *** |
| *Dovea macrocarpa* | *** |
| *Elegia capensis* | * |
| *E. cuspidata* | ** |
| *E. fenestrata* | ** |
| *E. filacea* | ** |
| *Hypodiscus neesii* | NR |
| *H. striatus* | NR |
| *Ischyrolepis ocreata* | ** |
| *I. sieberi* | *** |
| *I. subverticellata* | *** |
| *Restio bifarius* | ** |
| *R. brachiatus* | * |
| *R. festuciformis* | ** |
| *R. similis* | ** |
| *R. tetragonus* | *** |
| *R. triticeus* | ** |
| *Rhodocoma arida* | * |
| *R. capensis* | *** |
| *R. fruticosa* | * |
| *R. gigantea* | *** |
| *Staberoha aemula* | *** |
| *S. cernua* | *** |
| *S. vaginata* | ** |
| *Thamnochortus bachmannii* | *** |
| *T. cinereus* | *** |
| *T. pellucidus* | *** |
| *T. punctatus* | *** |
| *T. spicigerus* | *** |
| *T. sporadicus* | ** |
| *Willdenowia incurvata* | NR |

Key to responses:

*** = indicates very marked increase in germination (<1000%);

** = indicates marked increase in germination (<100%);

* = indicates moderate increase in germination (50-100%);

NR = no response to smoke; all nut-fruited species; seeds remain dormant; other germination cues probably involved.

will respond well to regular feeding with low concentrations of nutrients such as nitrogen. They may be fed with standard organic fertilizers such as Seagrow or Kelpak, or by sprinkling the surrounding soil with a small amount of ammonium sulphate during the growing season. Restios will respond to regular watering by showing more robust growth, but they are essentially plants which are adapted to a long dry season. Maintenance consists of the removal of dead stems. The dead stems of the more grass-like species like *R. festuciformis, R. brachiatus,* and *R. similis* can be left on the plant, as they will be hidden by the new growth. It is important not to damage the new growth, as once damaged, the stems will die.

## A GUIDE TO RESTIOS IN CULTIVATION

**Identification.** Restios are dioecious and the male and female plants of one species can look very different. This does make identification difficult, because both male and female specimens have to be collected to make the identification possible and in a field with more than one restio species it is not always obvious which male and female plants belong together. The inflorescences consist of small flowers carried in panicles, the male inflorescences being more widely spaced and loose, the female flowers compact and protected within the often striking golden or brown bracts.

**Better-Known Species Commonly Cultivated in the Past**.

***Chondropetalum tectorum* (Dakriet).** This species has a tufted growth form and grows to a height of 1.5 m with a spread of 1.5 to 3.0 m. It has slender compact flowering spikes with brown bracts. It is widely planted in gardens, being one of the few restios that has been available from nurseries for some years. There are large stands in Kirstenbosch Botanic Gardens.

***Thamnochortus insignis* (Dekriet) (Thatching Reed).** This species is an upright tufted plant growing up to 2.5 m in height and spreading to 3 to 4 m wide. It has heavily lignified culms which are ideal for thatching. The spikelets are yellow or golden brown in colour. It is a very attractive ornamental plant which can be grown in lawns with rocks around it, in rockeries, and in open beds. It also makes a good pot plant.

***Elegia capensis* (besemriet).** Besemriet is a very attractive species which grows to a height of 2 m. It grows in clumps or tussocks which have a spread of 1.5 m. This species has slender branches arranged in whorls at the nodes which gives an appearance rather similar to *Equisetum*. It produces golden brown flowers in spring. Besemriet is fast growing and plants can reach a height of 1 m in the 1st year from seed. It is one of the few species that has long been available from nurseries, possibly because its seed germinates readily. It has a long history of cultivation in Britain.

**New Restios with Horticultural Potential**. Plants of the following species have recently become available in quantity for the first time and are available for commercial cultivation.

***Ischyrolepis subverticillata.*** In its natural habitat this species grows in full sun in seasonally wet river beds. It may be found as close as 50 m from the sea to positions in light shade along small streams high up in the mountains. It is thus a plant for full sun or semishade, sandy, well drained soils, and preferably moist situations.

Mature plants eventually form large clumps 2 m high and more than 3 m in diameter and can be used as accent plants or in groups. *Ischyrolepis* produces small greenish-yellow flowers in autumn which develop into beautiful shiny speckled grey nutlets in the following early summer. The main decorative value lies in the sprays of dark green filiform foliage which is used in the cut flower industry.

***Restio brachiatus.*** In its natural habitat this species only occurs near stream beds. Plants can, however, be grown successfully away from water, and under these conditions they grow to a height and diameter of 1.5 m. Plants are compact and have finely divided stems. They are grey-green in colour and are good contrast plants in fynbos gardens. *Restio brachiatus* flowers in winter, with small cream-colored flowers in arching sprays. Large numbers of very small seeds are produced.

***Restio festuciformis.*** In its natural habitat this species is often found growing along stream banks and in damp places and may form large golden-brown sheets in marshy areas. Plants are very fast growing, often reaching maturity and flowering in the first year after planting. Their pattern of growth provides a changing picture throughout the year. The plants have bright green stems that produce inflorescences with golden-brown bracts in spring, maturing into dark brown seed heads in early summer. The new cycle of bright green stem growth follows shortly afterwards. Mature plants grow up to 400 mm high and 600 mm in diameter and are most suitable for planting in groups of three or more. Plants in cultivation at Kirstenbosch Botanic Garden have only had a relatively short lifespan and have needed to be replaced after 3 to 4 years

***Restio multiflorus.*** This species reaches a height of 1.75 m with a diameter of 1 m. The young plants are decorative with large numbers of bright green, sterile juvenile stems. After 1 or 2 years the fertile stems rise like a fountain out of the center of the plant, providing a striking picture. The female plants produce a mass of small white flowers while the male plants produce golden brown inflorescences.

***Restio similis.*** This species grows to a height of 750 mm with a diameter of 1.5 m. Plants are best grown in groups. The young plants are very striking with beautiful dark green stems which ripple in the wind. The plants produce small cream-colored flowers in autumn. Dark brown seed heads form later and these shed large numbers of small grey seeds.

***Thamnochortus cinereus***. This species occurs naturally in well drained habitats in the wet mountainous areas. It is one of the most strikingly colorful restios with its many grey-green sterile side shoots. In autumn and winter both the male and female flowering stems rise up above the foliage with large grass-like inflorescences. The male plants produce large silvery tassel-like flowers which stay decorative for at least 3 months. The plants grow to a height of 1 m with a diameter of 1 m and can be used very successfully both as accent plants and in small groups.

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