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'High Gold', a Yellow, Vigorous *Leucospermum*

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Leucospermum is the second largest product of the South African fresh flower industry that currently earns an estimated US $16.79 million in foreign currency (Wessels et al., 1997). To produce high-quality cut flowers that are insect- and disease-free it is of utmost importance that they be cultivated in an intensive, scientific agricultural system. These high-cost systems require cultivars with high yield, good quality flowers, and high turnover. Proteaceae cultivars have been released to the industry by the Agricultural Research Council (ARC) Fynbos Unit since the late 1970s (Brits, 1985; Brits and Van Niekerk, 1985).

'High Gold' [*Leucospermum cordifolium* (Salisb. Ex Knight) Fourcade x *L. patersonii* Phillips] was released by the ARC of South Africa. This vigorous, yellow-flowered cultivar is the only one that produces a high marketable yield in the 2nd year of growth and will tolerate slightly alkaline soil conditions. The name 'High Gold' has been registered with the International Registration Authority: Protea (The Directorate of Plant and Quality Control, Private Bag X5015, Stellenbosch 7599, South Africa). Plant breeder's rights have been awarded to the cultivar in South Africa, Australia, and Zimbabwe, with protection pending in the United States.

Origin

Leucospermum 'High Gold' is a selection (selection T84 11 03B) from a controlled pollination made in 1980 at Tygerhoek Experimental Farm in the Riviersonderend area, South Africa (34°9′S, 19°54′E). The female parent is 'Yellow Bird', a selection from semi-decumbent, yellow *Leucospermum cordifolium* plants with relatively low yield, made in the wild on the farm of Mr. and Mrs. Middelmann in the Kleinmond area. This population is now extinct. A rare yellow *Leucospermum patersonii* from the Stanford area was used as the male parent. *L. patersonii* has slightly smaller flower heads and is commercially less important than *L. cordifolium*. However, it is one of the few lime-tolerant proteas and therefore thrives on alkaline soils. Both parents are spring-flowering varieties and have similar flower heads. Three seeds were obtained from the cross and a single plant with upright growth habit was selected for further evaluation at Elsenburg Agricultural Development Institute in the Stellenbosch area. Elsenburg is situated at 33°50′S, 18°50′E and is 200 m above sea level.

Description

Leucospermum 'High Gold' is an exceptionally vigorous, upright growing perennial shrub with long, straight stems (Figs. 1 and 2). The dark green leaves are glabrous and cordate, with two to six teeth (sometimes none) at the apex. The width (2–4.5 cm) and length (2–8 cm) of the leaves varies, diminishing in size toward the shoot apex.

Bright yellow flowers are borne on a medium-sized, depressed-globose inflorescence 8–11 cm in diameter. One to two inflorescences are produced per stem. 'High Gold', like the parents, flowers in spring for 6 to 8 weeks from late September to early November in the southern hemisphere.

Culture

'High Gold' is vegetatively propagated by means of stem cuttings. Rooting rate is >85% when rooted with 24 °C bottom heat and mist irrigation. The cut flower production trial at Elsenburg Experimental Farm was not irrigated in the winter rainy season and drip-irrigated with 15–20 L per week per plant during the dry summer months. Yield data were obtained in a nonstatistical trial (Table 1). During the 1996 season, the production of all *Leucospermum* accessions except 'High Gold' in the genebank under evaluation dropped, irrespective of age. The reason for this phenomenon is unclear: it could be weather-related or due to wrong cultivation practices. 'High Gold' continued to be productive and showed only a reduction in stem length.

The plants were pruned after each flowering season by the standard set for *Leucospermum*, leaving a maximum of six bearers in year one, 12 to 16 bearers in year two, and not >20 to 24 in subsequent years. 'High Gold' plants normally live for 12 to 15 years, but as with most *Leucospermum*, are not frost hardy and are susceptible to the root rot disease, *Phytophthora cinnamomi*.

The plants grow best in full sun on well-drained soils of pH 4.5 to 6.0. 'High Gold' does not tolerate high phosphate levels (>20 mg·kg^{-1}) and nitrogen in the ammonium form must be used as fertilization (W.J.H. Eigenhuis, personal communication). 'High Gold' can tolerate slightly more alkaline soil conditions than other *Leucospermum* cultivars because of its *L. patersonii* parent. Although 'High Gold' originated from species adapted to the Medi-

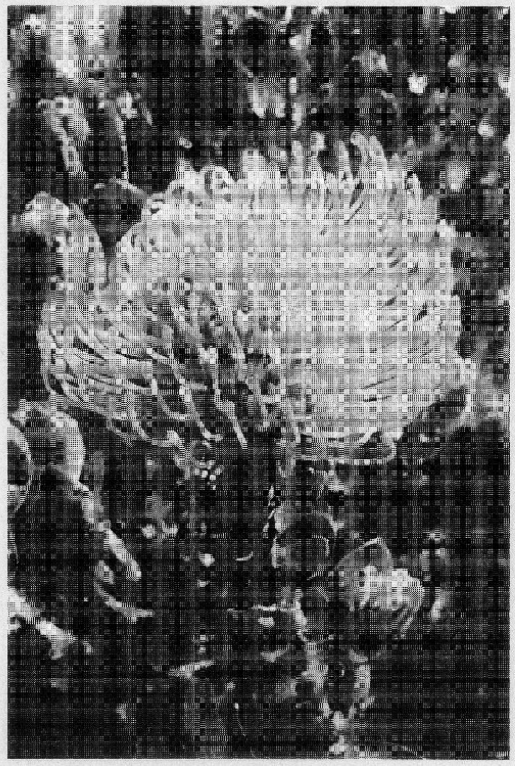

Fig. 1. The bright yellow flower of 'High Gold' borne on a depressed-globose inflorescence.

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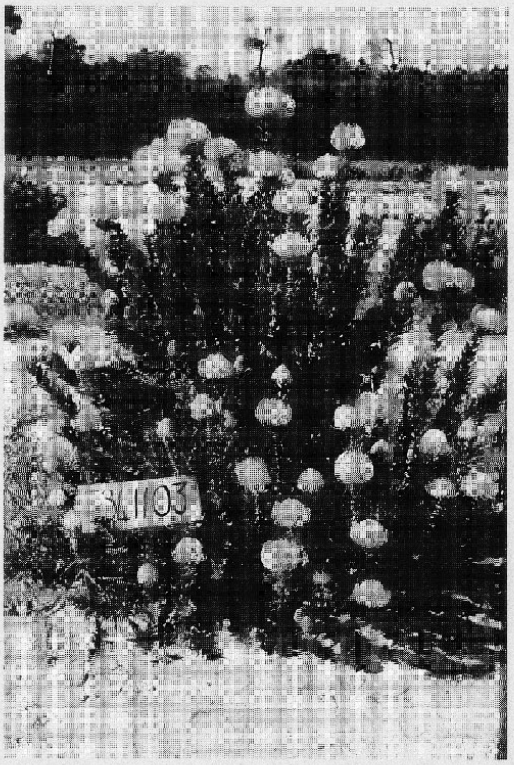

Fig. 2. A vigorous 2-year-old 'High Gold' shrub flowering, showing the upright growth habit.

Table 1. Cut flower yield of *Leucospermum* 'High Gold' at Elsenburg in comparison with the female parent 'Yellow Bird' in the same trial. The stem lengths (measured in cm) are classified in production lengths; stems <40 cm are ignored[z]. The clones were established Oct. 1991.

Age of plants	Marketable stems with single flower heads per stem				Marketable stems with two flower heads per stem				No. of second-grade	Total no.	Total yield of
	Stem length (cm)				Stem length (cm)						
(years)	40	50	60	>60	40	50	60	>60	stems	stems/plant[y]	'Yellow Bird'[y]
2	7.3	3.0	0.7	0	4.7	2.7	0.3	0	7.8	45.8	8.5
3	6.8	20.0	1.1	0	0.1	0.8	1.0	1.0	0	57.5	59.6
4	6.0	11.4	10.0	3.5	0	0.4	0.6	1.0	16.5	57.6	32.0
5	28.3	6.9	1.0	0	1.9	1.0	0	0	9.3	73.8	47.7

[z]The harvestable stems from eight plants were sorted and counted and the average determined to give a per-plant production figure.
[y]Total number of stems with minimum flowering branch length of 40 cm, marketable and unmarketable.

terranean winter rainfall region of South Africa, it performs very well in the summer rainfall areas, provided that no frosts occur. They could be cultivated in the United States in zone 10 and 11 of the U.S.D.A. Plant Hardiness Map (U.S. Dept of Agriculture, 1990), based on conditions observed in South Africa.

Availability

Since *Leucospermum* 'High Gold' is a hybrid, it can only be propagated vegetatively from stem cuttings. Plant material is available from ARC Fynbos Nursery, Private Bag X1, Elsenburg 7607, South Africa. Plant breeder's rights in South Africa, Australia, and Zimbabwe protect the cultivar, while application for protection rights has been made in the United States. Inquiries on the availability for research purposes, or for evaluation in other countries, should be addressed to The ARC Fynbos Genebank, at the above address.

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