

THE SOUTH AFRICAN FLORICULTURAL INDUSTRY AND THE PLANT BREEDERS' RIGHTS ACT: A SHORT REVIEW

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Highlights

- Review of Plant Breeders' Rights for the floricultural industry in South Africa.
- Problems of products not covered by PBR.
- Trends in the use of, and statistics for, the PBR system.
- Need for further research, analysis and improvements emphasised.

Abstract

The floriculture industry has been identified as one of the industries with an opportunity to grow and contribute positively to the economy of South Africa. The majority of plant breeders' rights applications filed in South Africa are of ornamental plants. This article gives a short review of the South African floricultural industry, some features of the Plant Breeders' Rights Act, 1976 (Act No. 15 of 1976), and the trends in plant breeders' rights applications and grants for ornamental plants over the past decade.

Key words: South Africa, ornamental plants, plant variety protection.

1. INTRODUCTION

Floriculture is an important multibillion dollar industry dealing with thousands of species and varieties of ornamental plants in both cultivation and the wild (Chin & Tay [2]). The most ornamentals are produced in Europe and countries with the largest share are the Netherlands (35%), Italy (18%) and Germany (11%), Production in Africa has increased over the last decade, with Kenya in the frontline followed by Tanzania, South Africa and Uganda. Besides an estimate of 0, 2 billion dollar production, there are hardly any figures available about ornamental production in this continent (van Uffelen & de Groot [22]).

Flower production ranks as one of the most efficient contributors to development and growth in the South African economy. This finding is based on the impact of this sector on aspects, such as value added to the economy, employment creation and income and wealth distribution within the local economy (Van Rooyen & Van Rooyen [21]). In South Africa, the industry employed about 17,500 people and it is argued that the South African floriculture industry has the opportunity to grow into a significant player on the international stage (Kaiser Associates [11]).

Several developing countries in the world have an interesting ornamental plant diversity that could gain added value in the future, either through direct development of commercial floriculture or through breeding of newer crops (Baudoin et al. [1]). South Africa is considered to be a 'hotspot' for biodiversity with 20,456 recorded indigenous vascular plant taxa; some 13,265 taxa representing 65% of our flora are internationally recognized (Raimondo et al. [15]). Despite the enormous richness in plant species, relatively few of these species are economically utilized.

In South Africa, indigenous ornamental flower species represent an untapped resource of inestimable proportion (Food and Agriculture Organization (FAO) [8]).

In this article a short review of the South African Floriculture industry and the trends in plant variety protection are given.

2. THE SOUTH AFRICAN FLORICULTURAL INDUSTRY

The South African floriculture industry has become competitive in the international market since the country's trade liberalization in 1994. The value of floriculture exports increased from R77 million in 1995 to R269 million in 2002 (Matthee et al. [11]). In terms of products and markets, there is exceptionally strong demand for the South African floriculture across the world. The major markets for South Africa's floricultural products are Europe (65%), the USA (9%) and Asia (5.2%) (Van Rooyen [20] cited in Matthee et al. [13]). Baudoin et al. [1] states that the Protea is South Africa's flagship cutflower export. The local market is valued at R240 million and export revenue amounts to about R280 million.

The indigenous flora of South Africa is world famous for its botanical diversity and is being exploited as cut flowers (Coetzee and Littejohn [3]). Over the last 250 years, horticulturists and botanists have transported many of South Africa floral plants to other regions of the world, where they developed them into garden and floral plants. Plants such as *Gladiolus*, *Freesia*, *Pelargonium*, *Strelitzia* and *Nerine* all originated in South Africa. These plants were developed into successful industries. The Freesia flowers for example that are sold annually on the Dutch

auctions have a value of about US \$100 million with no benefit to the country of origin (Coetzee et al. [5]). The initial success of this industry was based mainly on the unique novelty value of the products. Proteas and other fynbos species also infiltrated the “niche market” of their exotic floral products. Over the years an opportunity arose for countries such as Australia, New Zealand and Zimbabwe to initiate the cultivation of indigenous flora of South Africa and annex a part of the international protea flower market (Coetzee & Middelmann [4]). According to the Kaiser study [11], South Africa's indigenous products, particularly proteaceae, are “rapidly losing their indigenousness” as South Africa's competitors in Europe, the Middle East, the US and the Pacific Rim begin to cultivate large quantities of these products. Market saturation by traditional materials has provoked an increasing interest in novelties, both in the form of cultivars and new introductions from the wild, and more and more countries are looking to their native flora as a source of such introductions (Heywood [9]). According to Reinten and Coetzee [16], research funding for indigenous crops (in South Africa) is a limiting factor in scientific evaluations and trials to commercialize new crops, but worthwhile results have been achieved with regard to basic taxonomic documentation and general botany. Research has been conducted by the Agricultural Research Council (ARC) in South Africa in the field of floriculture using Fynbos. The ARC is a publicly funded institution mandated to conduct research, development and technology transfer to among others contribute to better quality of life. Many indigenous species have been used in their research, including *Protea*, *Leucadendron*, *Leucospermum*, *Serruria*, *Aulax*, *Mimetes*, *Paranomus*, *Ornithogalum*, *Lachenalia*, *Amaryllis belladonna*, *Nerine*, *Cyrtanthus*, *Gladiolus*, *Lapeirousia* and *Crinum* (Reinten and Coetzee [16]). Prinsloo [14] quotes the CEO of the South African Flower Export Council stating that growth of the floriculture industry depended on the export of “niche” products. However, for this to happen the

government needed to fund research and development to get indigenous species to a level where they can be commercially farmed. The ARC did not at present have the budget and capacity for this.

3. INTELLECTUAL PROPERTY PROTECTION

Botanical innovation resulting in the creation of new plant varieties is afforded legal protection through Intellectual Property Rights (IPRs) – specifically plant breeders' rights and patents. The key objective of plant variety protection is to stimulate plant variety innovations Thiele-Wittig and Claus [18]in Srinivasan [17]. The past few years have witnessed a significant worldwide strengthening of IPRs in plant breeding. This strengthening is the product of a growth in the number of countries that grant such rights, an expansion on the number of inventions that can be protected, and a broadening of the scope of protection offered by the extant IPR system (Louwaars et al. [12]).

The most commonly used global IPR method in plants is the International Union for the Protection of New Varieties of Plants (UPOV) Convention to protect plant breeder's rights. UPOV is an intergovernmental organization that seeks to provide and promote an effective system of plant variety protection, with the aim of encouraging the development of new varieties of plants, for the benefit of society. The first International Union for the Protection of Varieties of Plants (UPOV) Convention was established in 1961 and has since been revised in 1972, 1978 and in 1991. Jördens [10] describes the Convention of 1961 and the subsequent revisions. South Africa became the 10th member to join UPOV and is currently bound by the UPOV 1978

Convention.

3.1. Plant Breeders' Rights Act, 1976 (Act No. 15 of 1976)

In South Africa, breeders of new plant varieties are primarily afforded legal protection through plant breeders' rights in terms of the Plant Breeders' Rights Act, 1976 (Act No. 15 of 1976) (the Act) which is administered by the Department of Agriculture, Forestry and Fisheries (DAFF). To be eligible for protection in terms of this Act, plant varieties must be new; distinct, uniform and stable (DUS). A variety must also be afforded an acceptable variety denomination.

In South Africa, the DUS test and trials are conducted by officials of DAFF either on the department's premises or on the premises designated by the breeder, provided the closely related varieties are made available for comparisons with the candidate varieties. The test and trials are performed based on the UPOV Test Guidelines if available. However, in cases where no UPOV Test Guidelines are available for specific taxa, particularly for most of the indigenous species, National Test Guidelines are developed and used to assess DUS in candidate varieties.

3.1.1. The Registrar

The registrar is an official designated by the Minister of Agriculture, Forestry and Fisheries (the Minister) who is an authority to whom the protection of varieties is entrusted. Decisions relating to the granting and refusal of plant breeders' rights are taken by the Registrar. The Registrar also has an obligation to maintain the South African plant breeders' rights register. When an application is received, the Registrar checks that the application forms have been completely filled in, the relevant fees have been paid and that

the variety in question is still within the novelty period. If everything is in order, the technical examination is arranged through one of the three national evaluation centers. All matters relating to application and grants of plant breeders' rights are published quarterly in the national Government Gazette and in the Plant Variety Journal posted on the department's website (<http://www.daff.gov.za/docs/variety/plantvarietyjnl.htm>) [6].

3.1.2 The Appeal Board

Any person who feels aggrieved by any decision or action taken by the Registrar may appeal to the Minister against the decision or action in question. The Minister shall refer the appeal for investigation and decision to an appeal board. The appeal board, appointed by the Minister, would consist of one person designated as chairperson on account of his knowledge of law and two persons who in the opinion of the Minister have expert knowledge of the subject of the appeal. The appeal board may confirm, set aside or vary the relevant decision of the Registrar.

3. 1.3. Taxa eligible for protection

In South Africa, plant breeders' rights protection is extended to a limited number of species and genera as prescribed in the regulations of the Act. Any person who wishes to protect a plant variety of a taxon that is not prescribed must apply to the Registrar: Plant Breeders' Rights to have such a taxon included in the Regulations. Currently, about 350 taxa are listed in the regulations and about 60% of these are ornamentals. Approximately 20% of the listed ornamental plants are indigenous taxa. It is apparent that it is important for countries to extend protection to all genera and species in order to receive full benefits of

PVP (UPOV [19]). The Plant Breeders' Rights Act, 1976 is currently under review and one of the aims of this review is to extend protection to all kinds of plant genera and species.

3.1.4. Number of applications

Ornamental genetic resources are the biggest category of plant species for which plant breeders' rights are used to protect a variety (Engels [7]). This trend is also true for South Africa. More than 3 000 plant breeders' rights applications were received in South Africa between 2000 and 2010. It bears noting that most applications received, about 37%, are of ornamental plants. Table 1 shows the trend in number of applications for ornamental plants versus the number of applications received for other crops since 2000. Of all the ornamental plants applications received over this period, about 20% are of varieties developed from plants indigenous to South Africa.

Table 1: Participation of ornamental plants towards the total number of applications between 2000 and 2010.

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	TOTAL	%
Ornamental crops	117	81	124	156	152	115	99	84	64	106	103	1201	37%
Agricultural crops	49	70	70	85	69	76	93	143	136	117	104	1012	31%
Fruit crops	45	35	40	50	71	57	53	105	96	76	138	766	23%
Vegetable crops	16	37	28	42	19	9	18	44	24	30	21	288	9%
TOTAL	227	223	262	333	311	257	263	376	320	329	366	3267	100%

3.1.5. Number of valid plant breeders' rights

A total of 2 318 plant breeders' rights titles were in force at the end of December 2010. 897 of the valid plant breeders' rights are for ornamental plants. About 84% of these belong to foreign

breeders, 12 % to privately owned domestic entities and 4% to local public research institutions. Table 2 shows the top ten ornamental crops with valid plant breeders' rights by December 2010. One would note that most valid plant breeders' rights are for the Roses and indigenous taxa, e.g. *Agapanthus*, have relatively few protected varieties. However, the number of titles granted to foreign nationals against domestic nationals may have to be assessed on a crop-by-crop basis as some crops have only domestic applications, e.g. *Aloe* or only foreign applications, e.g. *Chrysanthemum*.

Table 2: Share of top ten taxa in plant breeders' rights for ornamental plants by December 2010

Taxon	Number of valid plant breeders' rights
1. <i>Rosa</i>	368
2. <i>Chrysanthemum</i>	64
3. <i>Impatiens</i>	30
4. <i>Perlagonium</i>	22
5. <i>Lilium</i>	21
6. <i>Argyranthemum</i>	18
7. <i>Osteospermum</i>	18
8. <i>Alstroemeria</i>	15
9. <i>Petunia</i>	15
10. <i>Agapanthus</i> ^a	10

^a Indicates taxa indigenous to South Africa.

The number of valid plant breeders' rights for cultivars developed from some popular species indigenous to South Africa are: *Agapanthus* (12), *Aloe* (31), *Gerbera* (2), *Leucadendron* (12), *Osteospermum* (16), *Pelargonium* (16), *Protea* (13), and *Zantedeschia* (23). Fig. 1 shows comparison of the number of valid plant breeders' rights for the afore-mentioned taxa in South Africa versus the number of valid plant breeders' rights in the European Union for these taxa (apart from *Protea*).

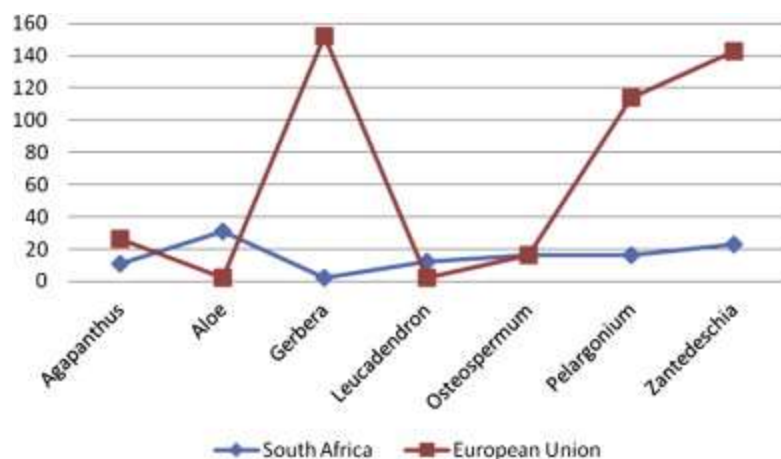


Fig. 1. Comparison of the number of valid plant breeders' rights between South Africa and the European Union.

Table 3 shows the distribution of plant breeders' rights holders for ornamental plants. It bears noting that most plant breeders' rights holders are from the EU countries. The importance of the floriculture sector in EU is well documented.

Table 3: Share of top ten holders of plant breeders' rights for ornamental plants by December 2010

Company	Country	Number of valid plant breeders' rights	Number of valid plant breeders rights on taxa indigenous to South Africa
1. Kordes Sohne	Germany	113	
2. Ball Horticultural Company	United States of America	49	10
3. Agricultural Research Council	South Africa	38	38
4. Dekker Breeding	Netherlands	36	
5. Delblard Pepiniers	France	27	
6. Meilland International	France	27	
7. Poulsen Roser APS	Denmark	22	
8. Deliflor Royalties	Netherlands	21	
9. Ludwig's Roses	South Africa	21	
10. VLetter & De Haan	Netherlands	19	

3.2 Intellectual Property Rights from the Publicly Financed Research and Development Act, 2008 (Act No. 51 of 2008)

The Department of Science and Technology, through the National Intellectual Property Management Office (NIPMO) administers the Intellectual Property Rights from the Publicly Financed Research and Development Act, 2008 (Act No. 51 of 2008) (IPR Act). The object of this Act is to ensure that intellectual property emanating from publicly financed research is identified, protected, utilized and commercialized for the benefit of the people of South Africa, whether it be social, economic, military or any other benefit. The IPR Act also makes provisions for, among others: the disclosure of intellectual property, the establishment of office and technology transfer at institutions, the rights of intellectual property creators in institutions to benefit-sharing as well as acquisition of intellectual property rights by the State.

4. DISCUSSION

In this study the economic importance of the South African floricultural industry is highlighted. It is recognized that South African floriculture industry has the opportunity to grow into a significant player in the world floricultural markets. It is however argued that this may be deterred by, among others, the fact that South Africa's indigenous products are being copied and improved by its competitors at an alarming rate due to the fact that there is currently no protection strategy in place in many cases (Kaiser Associates [11]). Inflationary pressures, tariffs, a volatile and restrictive, slow-moving, regulatory issues are putting additional stress on South Africa's high-volume, low margin flower industry (Prinsloo [14]).

In this study, the circumstances surrounding the Plant Breeders' Rights Act show that a high number of plant breeders' rights applications have been received for ornamental crops compared to other crop types in the past decade. It is shown that despite the biodiversity richness of South Africa, very few indigenous taxa are eligible for protection in terms of the Plant Breeders' Rights Act and even much fewer local cultivars are protected. Coetzee & Middleman [4] argue that due to the serious threat from competing countries, only unique cultivars can give South Africa the competitive edge. Such cultivars can be protected internationally by registration of plant breeders' rights and patent rights, thereby providing protection to local cultivators. It would be important to structure government initiatives to assist the private sector to expand this industry. Effective linkages between technology, research and development and producers could clearly provide a major boost to the South African flower industry (Van Rooyen & Van Rooyen [21]).

The impact of the plant variety protection system on the South African floricultural industry is not well documented. It may be useful to investigate the role of the plant variety protection system in improving the competitiveness of the South African flower industry internationally. Future studies may give insight on, among others: the benefits and challenges with regard to the plant variety protection system in the floricultural industry; the effects of the plant variety protection system on public and private research & development and investment in plant breeding; the extent, difficulties and benefits of international plant variety protection for domestically bred cultivars; the impact of the plant variety protection system on different role players of the floricultural industry chain, e.g. supermarkets, gardening centers, florists. These matters need to be investigated in consultation with both the regulators and the floricultural industry.

5. CONCLUSION

In the past South Africa has lost many indigenous species that have provided large financial benefits to foreign countries with no benefit to South Africa. Because there is limited funding and resources to develop the potential of many indigenous species there is a possibility to collaborate with other floriculture producing countries with some agreements on benefit sharing.

There is little empirical evidence concerning the impact of plant breeders' rights on the South African floricultural industry. More studies are needed to identify and clarify real or perceived constraints imposed by the national regulatory system (intellectual property, biodiversity, agriculture) that might jeopardize the viability of floriculture efforts especially based on exploitation of indigenous plants. Information on the national production of ornamental plants and the effectiveness of Government's support programmes (nationally and provincially) is not well documented. Hopefully, the outcomes from such studies might recommend practical actions and provide guidance to the government, the research community and the industry in order to promote further development of the South African floriculture industry.

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