Application for protection of the name "Rooibos" in terms of Section 15 of the Merchandise Marks Act, Act No 17 of 1941

Date of application: 4 June 2013

1. The applicant

South African Rooibos Council (SARC)

The South African Rooibos Council (SARC) is an independent and voluntary industry organization, whose members are involved in processing, packing, branding and exporting of rooibos tea. The principle mandate of the organization is to responsibly promote rooibos and its attributes to the consumer and protecting the interests of the rooibos consumer and SARC stakeholders supported by effected research and communication. Jointly, they represent an estimated 80% of the volume and value of the annual production and sales of Rooibos.

The SARC has been incorporated under South African law as a section 21 (not-for profit) company (Registration number 2005/005833/08). The South African register of companies is kept by the South African Companies and Intellectual Properties Commission (CIPC) – a statutory body established under the Companies Act (Act 71 of 2008) that reports to the Minister of Trade and Industry.

Legal Address:	31B Pine Street Pniel Western Cape 7681
E-mail:	info@sarooibos.co.za
Tel:	+27 (0)21 885 2347
Fax:	+27 (0)86 695 6291
Website:	www.sarooibos.co.za

2. Type of product

Herbal tea: Class 2.3 of the Harmonised System Commodities Classification Code

3. Specification

The following products, inter-linked and originating from the same area, will be registered under this application:

- Rooibos: The oxidised, dried leaves and stems of *Aspalathus linearis.*
- Rooibos tea: The infusion (or tea) made from Rooibos.
- Green Rooibos: The unoxidised, dried leaves and stems of *Aspalathus linearis.*
- Green Rooibos tea: The infusion (or tea) made from green Rooibos.
- The water-soluble extracts prepared from Rooibos or green Rooibos, available as a concentrated liquid or dry powder.

3.1 Name of the product

Protection is sought for the following names:

a) Rooibos (Afrikaans – an indigenous language, and one South Africa's official languages)
b) Red bush (English – an official language in South Africa)
c) Rooibostee (traditional use in Afrikaans)
d) Rooibos tea (combination of Afrikaans and English)

e) Rooitee (variation on traditional use in Afrikaans)
f) Rooitea (traditional mixed use in Afrikaans and English)
g) Rooibosch (traditional use in Afrikaans, from Dutch)

The product derives its name from the natural, red colour of the tea leaves when dried in the sun, brought about by naturally occurring enzymes that oxidises the plant material.

Rooibos is the common name traditionally used throughout Southern Africa for the products and extracts from the *Aspalathus linearis* plant. This plant occurs naturally only in the intersect between the winter rainfall area and fynbos region of the south-western part of South Africa, where the plant is uniquely adapted to the geography, geology and climate of the region. More than 125 years ago, the local inhabitants of this region discovered how to cure, using artisan techniques, an aromatic beverage from Rooibos plant material. This beverage had the characteristics of a conventional tea infusion and bore surprising similarities to some aromatic and fragrant Chinese teas, such as Oolongs, popular in Europe at the time. Today, the drying and fermenting of the Rooibos plant still take place within this region of production, giving Rooibos its unique characteristics.

The purpose of this application is to protect this link between geographical origin and specificity of Rooibos and the human knowledge and traditional use of Rooibos and Rooibos-based products.

It is important to note that several local laws and international agreements govern access to and use of South Africa's indigenous resources, and the sharing of the benefits from the use of these resources. Indigenous biological resources include all indigenous animals and plants, living or dead, including their genetic material.

3.2. Description of Rooibos, associated products and Rooibos plants

3.2.1 Product description: Rooibos

Rooibos is the oxidised (or "fermented") dried leaves and stems of *Aspalathus linearis*. Rooibos has a distinctive colour that ranges from light reddish-brown to a shiny brick-red colour. It may also have some lighter coloured sticks (dried pieces of stem) mixed with the rest of the product, but no foreign plant material may be present. The moisture level of the dried Rooibos tea leaves must be below 10%.

3.2.2 Product description: Rooibos infusion

Rooibos infusion (commonly referred to as Rooibos tea) is prepared by steeping Rooibos (the dried and cured leaves and stems) in freshly boiled water. The resulting infusion is a clear liquid with a reddish-brown to a deep brick red colour. A darker coloured infusion is obtained by making a stronger infusion (adding more Rooibos leaves or Rooibos tea bags), steeping it for longer or by brewing it for longer. Rooibos infusion has a smooth, slightly astringent mouthfeel and slightly sweet taste that is pleasant hot or chilled. Its mouthfeel ranges from medium-bodied to full-bodied and the flavour notes are predominantly sweet/honey, floral, fruity or woody.

Some would argue that Rooibos infusion is not a true herbal tea, since herbal teas are traditionally defined as plant-based teas that are merely dried in the sun, without any sort of curing process. In contrast, Rooibos undergoes a traditional curing process that has its roots in ancient Chinese tea-curing processes, where leaves are bruised and oxidised to bring out flavour. This results in a much more sophisticated product than herbal teas. The fact that Rooibos is partly oxidised like black teas, provides consumers a choice to enjoy it with or without milk, thereby allowing both black tea and herbal tea users accessible usage.

3.2.3 Product description: Green Rooibos

Green Rooibos is the unoxidized (or "unfermented") dried leaves and stems of the *Aspalathus linearis* plant. The dried tea leaves should have a light to olive green colour, with no signs of browning or oxidation. The dried plant material may include small cream-coloured, woody pieces of stem, or thin red-brown stems of similar thickness to leaves, but it may not contain any foreign plant material. The moisture level of the dried green Rooibos tea leaves must be below 10%. Ideally, it should be between 6 – 7% to ensure that no oxidation, or browning, takes place.

3.2.4 Product description: Green Rooibos infusion

Green Rooibos infusion is prepared from green Rooibos leaves or tea bags. It has a light yellow-green colour, with orange to light-brown tint, and a mild and fresh "green" taste reminiscent of green tea, but with only a very light astringency.

3.2.5 General description: Rooibos plant (*Aspalathus linearis)*

Rooibos originates from *Aspalathus linearis,* a plant species that is being both cultivated and harvested from the wild.

Aspalathus linearis is one of 278 species within its genus. The Germplasm Resources Information Network (GRIN) of the United States Department of Agriculture lists the taxonomy of *Aspalathus linearis* as follows:

Kingdom	*Plantae* – Plants
Sub-kingdom	*Tracheobionta* – Vascular plants
Superdivision	*Spermatophyta* – Seed plants
Division	*Magnoliophyta* – Flowering plants
Class	*Magnoliopsida* – Dicotyledons
Subclass	*Rosidae*
Order	*Fabales*
Family	*Fabaceae* – Pea family
Genus	*Aspalathus* L. –Aspalathus
Species	*Aspalathus linearis (Burm. F.) R. Dahlgren*

Aspalathus linearis is an erect to spreading, highly variable leguminous shrub that grows up to 2 m high. Young branches and branch tips are often reddish in colour. The leaves are green and needle-like, 15 – 60 mm long and up to about 1 mm thick. They are without stalks and stipules and may be densely clustered (Leistner, 2000).

Various wild forms have been described, each with characteristic morphology and geographical distribution (Van der Bank et al, 1995; Dahlgren, 1964, 1968 and 1988). The range of variation is easily observed in wild populations throughout the natural distribution area of the species (Dahlgren, 1963 and 1968; Stassen, 1989; Van der Bank, 1999; Van Heerden, 2003).

The type of *Aspalathus linearis* that is cultivated commercially for tea and related products is also sometimes referred to as the "red type", also known as the Rocklands type, and is native to the Pakhuis Pass area in the northern Cederberg region (Van Wyk et al, 1993).

On the basis of a morphometric study and statistical analysis, wild Rooibos plants that are harvested for consumption are categorised into four morphological types (Louw et al, 2006; Malgas et al, 2010):

- Suid-Bokkeveld: "*Veldtee*", a voluminous re-sprouter described as the shrub form.

- Wupperthal: "*Langbeentee*" (long-legged tea) or "*Regoptee*" (upright tea), a re-seeder (erect form).
- Wupperthal: "*Ranktee*" or "*Rankiestee*" (creeper tea), a sparse re-sprouter (prostrate form).
- Biedouw Valley: "*Boomtee*" (tree tea), an erect reseeder (tree type).

3.2.6 Rooibos quality and grading parameters

Expert graders evaluate the quality of Rooibos and Green Rooibos according to a number of factors, including the colour of the dry and infused leaves, the intensity, colour and clarity of the infusion, as well as the flavour and taste. Trained sensory panels are often used to judge taste and flavour. A combination of these parameters is used to grade the Rooibos as A, B, C or D, with A representing the highest grade.

Research funded by the South African Rooibos Council confirmed that the quality grading was also reflected in the phenolic composition and total antioxidant capacity of hot water fermented Rooibos extracts, prepared according to simulated industrial conditions (Joubert and De Beer, 2012). The large, natural variations in values for total polyphenol content and total antioxidant capacity in Rooibos were confirmed by another study by Joubert et al (2012). This study also showed that grade A and D is associated with the highest and lowest values respectively.

3.2.7 Describing the sensory characteristics of Rooibos

A SARC-funded research team, based at South Africa's Agricultural Research Council and Stellenbosch University, has developed a flavour and mouth-feel wheel with 27 descriptive attributes for Rooibos. The 20 flavour and seven taste and mouth-feel descriptors are based on analysis of a large sample set (Koch et al, 2012). The wheel captures the sensory fingerprint of rooibos.

This sensory wheel is a valuable tool to facilitate communication among Rooibos producers, processors, grading experts, marketers, flavour houses, importers and consumers. To aid interpretation of the descriptors a preliminary sensory lexicon for some of the descriptors has also been developed (Koch et al, 2012). The sensory wheel and lexicon should create opportunities for niche products with specific flavours.

3.2.8 The chemical and nutritional composition of Rooibos

The large variations in the complex phenolic chemistry of *Aspalathus linearis* have been well documented (Rabe et al, 1994; Van Heerden et al, 2003; Joubert et al, 2008; Beelders et al, 2012; Joubert et al, 2013). The main phenolic compounds of the Rooibos plant are aspalathin, and its flavone isomers, orientin and iso-orientin, with smaller amounts of other flavonoids such as isoquercitrin, rutin, luteolin, vitexin, isovitexin, chrysoeriol, hyperoside, quercetin-3-robinobioside also present (Joubert et al, 2008 and 2008b; Beelders et al, 2012). The flavonoid composition of Rooibos is unique in that it contains aspalathin and aspalalinin, as well as the rare compounds nothofagin and enolicphenylpyruvic acid glucoside. Whereas most of the flavonoids occur ubiquitously in the plant kingdom, until now aspalathin has only been detected in *Aspalathus linearis* (and in the tea brewed from this plant), contributing to its novelty value (Joubert and Schulz, 2006).

Aspalathin is the major flavonoid of green (unfermented or unoxidised) Rooibos and it remains one of the major constituents of the water extract of (oxidised) Rooibos despite its substantial decrease during fermentation. The types of polyphenols in Rooibos tea are different than those in green and black teas, but many of the polyphenols in Rooibos are also strong antioxidants (Joubert and De Beer, 2011).

Aspalathin is important, not only because it is a novel compound, but also because it is one of the most active antioxidants in *Aspalathus linearis*. Aspalathin levels decrease during oxidation but is still a major flavonoid constituent of traditional (oxidised) Rooibos. The nothofagin content reduced during oxidation,

but it can be found in the oxidised product. Rooibos plant material contains between 0.02 and 1.16% aspalathin and between 0 and 0.4% nothofagin (Joubert et al, 2013).

The phenolic content and antioxidant activity of Rooibos are associated with the tea's health- promoting properties. However, the flavonoid composition of Rooibos varies depending on the soil conditions and region where *Aspalathus linearis* grows. It is also influenced by the genetic variations in the seeds used to propagate the plant. Van der Bank et al (1995) studied the genetic diversity of *Aspalathus linearis.*

Total polyphenol and major flavonoid content of hot water extracts and infusions of *Aspalathus linearis* (oxidised rooibos) is summarised by Joubert and De Beer (2012) and Joubert et al (2012), respectively. Researchers continue to refine analytical techniques for the in-depth analysis of Rooibos phenolics, including its minor compounds (Beelders et al, 2012).

Rooibos is naturally caffeine free (Morton, 1983). This was confirmed by tests performed during 2009 using state-of-the-art equipment at the LCMS laboratory at the Central Analytical Facility at Stellenbosch University.

While Rooibos does not contain any preservatives or colourants, it is often blended with other herbs or teas, and sometimes flavoured (Joubert et al, 2008).

3.2.9 Health and safety of Rooibos

The historical and modern use of Rooibos as a beverage for everyday consumption has led to a general assumption of its safety as no reports of toxicity, at the normal use as herbal tea, has been documented (Joubert et al, 2008). No toxicological studies have been done, however, a number of studies have addressed aspects of safety and toxicity of Rooibos. Chronic consumption of aqueous extracts of unfermented and fermented Rooibos by rats over a period of 10 weeks did not cause any adverse effects in the liver and kidney, considering the serum biochemical data. The serum iron and cholesterol levels were also not significantly altered (Marnewick et al, 2003). In 2007, McKay and Blumberg also reviewed scientific literature and reported that no undesirable effects of Rooibos consumption have ever been documented. This was again confirmed in a 2008 South African study where no adverse effects could be found in a group of 40 participants who each drank six cups of Rooibos per day for six weeks (Marnewick, 2010).

3.3. Delimitation of the geographical area of production

3.3.1 Criteria for delimitation

The demarcation of the specific areas where Rooibos may be produced, including cultivation and harvesting in the wild, as well as drying and fermenting, is determined based on two criteria that are both critical aspects for the natural occurrence of *Aspalathus linearis*. Firstly, the areas must fall within the winter rainfall area of South Africa, and secondly, it must be in the fynbos biome. Conservation areas formally protected in terms of South African legislation are excluded.

The area corresponding to the intersection between the fynbos biome and winter rainfall area is provided in Figure 1 with administrative boundaries overlaid on the same map. Figure 1 shows that the most significant Rooibos production area is in the Western Cape Province of South Africa, with a much smaller Rooibos-producing area in the Northern Cape Province.

Rooibos and related products are produced, processed and dried in the following geographical areas of South Africa:

- In the Western Cape Province, the Municipalities of Bergriver, Breede River, Breede Valley, Cape Agulhas, Cederberg, City of Cape Town, Drakenstein, Matzikamma, Overstrand,

Stellenbosch, Swartland, Swellendam, Theewaterskloof and Saldanha Bay.

- In the Northern Cape Province, the Municipality of Hantam.

Figure 1: The intersect between the fynbos biome and the winter rainfall area in South Africa (Source: Western Cape Department of Agriculture)

3.3.2 Soil characteristics of Rooibos-producing areas

Another very important characteristic of areas for Rooibos plant cultivation is that *Aspalathus linearis* is planted on sandy soils with a pH below 7. In the south-western part of South Africa this soil type is typically a derivative of the Table Mountain Sandstone Complex.

Table 1 shows that 694 864 hectares of soils are derived from Table Mountain sandstone. By far the largest part of this area (278 986 ha) can be found in the Cederberg municipality, followed by Hantam (76 939 ha) and Matzikamma (72 429 ha). It follows that about 60% of the area most suitable for Rooibos production are found in these three adjacent municipal areas.

Table 1: Area of soils derived from the Table Mountain Sandstone complex in the fynbos/winter rain intersect (Source: Western Cape Department of Agriculture)

MUNICIPALITY	Area	
	Ha	%
Cederberg	278 986	40,25
Hantam	76 939	11,17
Matzikamma	72 918	10,59
Overstrand	60 910	8,87
Bergriver	60 794	8,85
Theewaterskloof	43 426	4,85
Cape Agulhas	32 962	4,84
Witzenberg	38 893	5,7
Breede River/Winelands	10 577	1,62
Breede Valley	5 461	0,89
Stellenbosch	4 886	0,8
Drakenstein	4 144	0,7
City of Cape Town	2 835	0,51
Swartland	1 002	0,24
Swellendam	129	0,12
Saldanha Bay	0	0
Total	694 862	100

3.3.3 Climate characteristics of Rooibos-producing areas

Unique characteristics of the climate of the fynbos biome include its long, harsh and dry summer months combined with wet winters. The result is that fynbos species, including *Aspalathus linearis*, developed some unique features to cope with these conditions, such as the unique shape and coating of its leaves.

The internationally recognised Köppen Climate Classification System shows clearly that the western part of South Africa is dominated by winter rainfall (Figure 2). Moving along to the east of the country, outside the Rooibos production area, this is replaced by year-round rainfall.

Figure 2: A description of the climate of the south-western part of South Africa with the aid of Köppen classes (Source: Western Cape Department of Agriculture)

4 The unique link between Rooibos and its geographic area of origin

4.1 Where Rooibos grows and how it is adapted to its environment

The genus *Aspalathus* consists of over 200 species that are all endemic to South Africa (Malgas, 2010). Most of the species are concentrated in the Cape Floristic Region, but only *Aspalathus linearis* has economic value (Wilson, 2005). The natural distribution and commercial cultivation have been studied by many scientists and documented as follows:

- *Aspalathus linearis* is a fynbos species, limited in its distribution, occurring naturally only in the western districts of the Cape Province, particularly in the Cederberg Mountains (Dahlgren,

1968; Morton, 1983). More specifically, the commercial sub-genus Nortiera, widely used to produce Rooibos, grows naturally in the north-western Cape (Ginsberg, 1976).

- Dahlgren (1988) states that "*Aspalathus linearis* is naturally distributed in the winter rainfall area from Vanrhynsdorp in the north to the Cape Peninsula and the Betty's Bay area in the south". The plant is grown commercially in nutrient-poor, sandy, acidic soils in the Clanwilliam area of the Cederberg mountains (Muofhe and Dakora, 2000).
- Cultivation of *Aspalathus linearis* occurs mainly in the Cederberg mountain region but extends to areas such as Darling and Nieuwoudtville (Joubert & Schulz, 2006).
- Small-scale farmers in Wupperthal and on the Suid-Bokkeveld plateau near Nieuwoudtville harvest wild Rooibos plants, which vary significantly in growth form and reproductive strategy (Joubert et al, 2008). A rich body of knowledge on wild Rooibos plants exists among these local harvesters who identify four main growth forms. These are an „erect form" and a „prostrate form" in the Wupperthal area, a „shrub form" in the Suid-Bokkeveld, and a „tree form" that has been observed at specific sites at Wupperthal, Biedouw and the Suid-Bokkeveld. Molecular studies have revealed significant genetic differences between the different growth forms (Malgas, 2010).
- Commercial farming with *Aspalathus linearis* within its natural distribution area started in the 1930s and has developed as an important agricultural industry for South Africa. In 2010 Rooibos represented approximately 23% of the South African tea market with sales reaching more than 5000 tons. It is enjoying popularity in nearly 11 million households in the country. Germany, the Netherlands, the United Kingdom, Japan and the United States of America represented 86% of the export market of 6000 tons in 2010 (Joubert and De Beer, 2011).

The most important region for Rooibos farming is the Clanwilliam area in the northern part of the Western Cape, the Cederberg and Olifants River mountain ranges and the surrounding slopes and valleys that provide for well-drained, deep, cool, sandy soil „with a low acid and good moisture retaining qualities" (Ginsberg, 1976 and Dahlgren, 1988).

Several more scientists have commented on the ability of Rooibos plants to grow in poor soils and harsh climatic conditions:

- Green (1949) noted that Aspalathus linearis grows in poor, sandy soil and "flourishes where even rye will not grow".
- Nolte (1968) documented that *Aspalathus linearis* needs deep, well-drained, sandy, acid soil.
- Muofhe and Dakora (1999) found that *Aspalathus linearis* showed remarkable growth in its natural setting despite the low nutrient status of Clanwilliam soil. They found that the ideal pH of the soil is 4.5 – 5.5.

Scientists studying the unique adaptations of *Aspalathus linearis* to its environment have documented these findings:

- Hawkins et al (2009) describes how *Aspalathus linearis* has adapted to the dry summers and nutrient poor, acidic soils in which it grows. In addition to a network of lateral roots just below the soil surface that can use even light precipitation, the plant has a long tap root that reaches as deep as two meters to help the plant find moisture.
- As a legume, *Aspalathus linearis* contains nodules of nitrogen-fixing bacteria on its roots. This characteristic helps the plant to survive in the poor Cederberg soils and minimizes the need for fertilising commercial crops with nitrogen (Muofhe and Dakora, 1999). The bacteria convert nitrogen dioxide to biologically useful ammonia in a process known as nitrogen fixation. The plant absorbs the nitrogen and benefits from it in exchange for providing the bacteria with food. Unfertilised crops of *Aspalathus linearis* contribute significantly to the nitrogen economy of the ecosystem. This symbiotic relationship is part of the remarkable adaptation of *Aspalathus linearis* to the nutrient-poor, low pH conditions of the Cederberg soils (Muofhe and Dakora, 2000). The level of symbiotic activity for miccorhizal nodulated roots of *Aspalathus linearis* was

found by Muofhe and Dakora (1999) to be high. They considered it highly intriguing that the plant is able to form effective symbiosis with bradyrhizobia in a soil characterized by extremely low nutrient levels and high proton stress. The indigenous bradyrhizobia are naturally tolerant of acidity and the plant has some ability to modify its rhizosphere pH in order to promote symbiotic establishment and nutrient availability to plants growing in this otherwise infertile, acidic soils (Muofhe, 1997).

- Muofhe and Dakora (1999) state that *Aspalathus linearis* and its associated microsymbiont are very unique in their ability to establish functional nitrogen-fixing symbioses in the extremely nutrient-poor and acidic Cederberg soils. They further state that few symbioses, if any, have been reported in the literature that can tolerate such extremities of soil acidity and low nutrient stress and fixing high levels of nitrogen as exhibited by *Aspalathus linearis.*
- *Aspalathus linearis* also forms cluster roots which enables the plant to enhance phosphorus acquisition from the soil which is among the most phosphorous impoverished in the world (Lambers & Shane, 2007).

Attempts to grow *Aspalathus linearis* commercially elsewhere in South Africa or the world have not been successful (Morton, 1983).

4.2 Biodiversity within the delimited area

The biodiversity status of the region in which Rooibos is produced is an important consideration for the industry. The Rooibos plant is cultivated in the Cape Floristic Region which is designated by Conservation International as a biodiversity hotspot (Mittermeier et al, 2005); and fynbos is a WWF Global 200 priority eco-region for conservation (Malcolm et al, 2002).

In 2004, an area known as the “Cape Floral Region Protected Areas” was also inscribed by UNESCO as a World Heritage Site. The site includes eight representative protected areas, of which the following fall within the demarcated Rooibos production area:

- Table Mountain National Park
- Cederberg Wilderness Area
- Groot Winterhoek Wilderness Area
- Boland Mountain Complex (Limietberg Nature Reserve, Jonkershoek Nature Reserve, Assegaaibosch Nature Reserve, Hottentots Holland Nature Reserve, Kogelberg Nature Reserve)

Aspalathus linearis is not a threatened species but a number of factors are causing areas with natural populations to decrease and other plant species to be threatened:

- Since it is logical for producers to cultivate Rooibos plants in areas where it is already known to grow naturally, this leads to loss of the natural population with the replacement of only the cultivated type. Ideally, areas containing populations of wild *Aspalathus linearis* should be conserved, and farmers should avoid ploughing any areas in which populations of wild *Aspalathus linearis* occur naturally.
- The uncontrolled harvesting of wild *Aspalathus linearis* is another threat, but there are now guidelines available for the sustainable harvesting of this plant.
- Although wild *Aspalathus linearis* does not occur only in endangered vegetation types, it is associated with vulnerable plant species (Hawkins et al, 2009). Regardless of the threat status of the vegetation type in which Rooibos is cultivated (Critically Endangered, Endangered, Vulnerable or Least Threatened), as listed in the National List of Ecosystems that are threatened and in need of protection (Government Notice 1002, Government Gazette, 2011), many plant species associated with the same subset of environmental conditions suitable for Rooibos have become threatened. Consequently, conversion of natural vegetation to plantations of *Aspalathus linearis* triggers loss of biodiversity. Conversion of natural land for cultivation is also controlled by law and biodiversity management is considered to be an

important dimension of sustainable Rooibos production.

In particular it is recognized that for the sustainability of the industry it is important to conserve sub-species of wild *Aspalathus linearis* in situ. Wild *Aspalathus linearis* ecotypes are also likely to have importance as distinct genotypes due to different ecotypes and populations having different water use efficiencies (Hawkins et al, 2009).

It is also important to control fires in areas where Rooibos plants occur naturally, especially if fires occur sooner than 15 years after a previous fire and when they occur in any season than during later summer/autumn which is from February to April (Cowling, 1987; Schutte et al, 1995).

The removal of invasive alien plant species from areas where Rooibos plants grow naturally and are collected, also contributes towards the conservation of wild *Aspalathus linearis.*

Future loss of biodiversity is addressed by South African environmental legislation [National Environmental Management Act (Act 107 of 1998), and the Environmental Impact Assessment Regulations], various spatial informants such as Biodiversity Sector Plans, Area Wide Plans and an Environmental Management Framework (in development) for part of the main production area, and the development and implementation of biodiversity best practices for Rooibos production.

In 2011, SARC collaborated with a number of industry stakeholders to develop the Handbook for Implementing Rooibos sustainability standards as an effort to promote responsible social and environmental practises in Rooibos farming. The Handbook can be viewed at: https://www.conservation.org/global/ci_south_africa/publications/Documents/handbook-implementing-rooibos-sustainability-standards.pdf

4.3 The history of Rooibos and its links with the geographical area

The Cape was founded to supply ships on the great tea route from Asia. From the late 17th century to the mid-19th century, tea was the principal cargo of Europe-bound Dutch East India Company and English East India Company ships. Chinese-style tea drinking became the custom in and around Cape Town, mirroring Europe. By the second decade of the 19th century the high duty and price of tea, as well as occasional shortages, caused the Cape Town citizenry to protest against the English India Company monopoly. Farmers on the frontiers of the colony could not secure supplies (Marcus, 1973).

Swedish naturalist Carl Thunberg visited the Cape interior in 1772 in search of plants. He saw that local people of this region made tea from *Borbonia cordata*, now re-classified as *Aspalathus cordata*. Colloqially this was known as “stekeltee” and was used for medicinal purposes. This legume is related to Rooibos and suggests an adaption by Dutch farmers of the northern European medicinal herb-infusion tradition.

Isolated in remote frontier areas, the rural Cape population had adapted to tough conditions. They had limited access to essential and lifestyle products. They therefore acquired knowledge of local plants and many uses, including medicinal, culinary and household uses, for example how to use waxes from plants for candles, and obtaining tanning extracts from tree bark. Tea and coffee substitutes – both for medicinal and leisure use – were increasingly found in remote country districts. The locals developed unique, artisan-craft techniques to process and prepare the “bush teas” and “veld coffees”.

People living in the mountainous Cederberg region of South Africa"s Western Cape discovered that one could brew a tasty tea from the wild Rooibos plant (Ginsberg, 1976). The skill to process Rooibos is a unique and distinct regional adaptation of Far Eastern tea-curing techniques. Rooibos is an unusual native plant, which lent itself to a unique adaptation of traditional bruising, oxidisation, and curing

techniques, developed through experimentation and honing of skills by local artisan-craftsmen in the Cape Cederberg mountains, quite specific to this area.

Camellia sinensis leaves are moisture-laden, and need to be left in flat bamboo trays for several hours to wither and lose moisture, whereas, in strong contrast, Cape curers of Rooibos, discovered that the plants of this dry climate were low in moisture, and needed added water, to speed the oxidation process (locally termed „sweating' or „fermenting', although no yeast enzymes are involved).

Traditionally leaves and stems of *Aspalathus linearis* were collected on the mountains and carried down the steep slopes on the backs of donkeys. Tightly bundled in hessian bags, the Rooibos plant material soon started oxidising in the high summer temperatures which often reached 40°C. The Rooibos processing methods that are still in use today – first cut and bruise the leaves and stems, then" sweat" or cure the tea in heaps and finally spread it out to dry in the sun – were developed at that time (Joubert et al, 2008).

In 1904, Benjamin (Barend) Ginsberg, a young Russian émigré travelled to Clanwilliam to join his father, an ex-Russian soldier. He had just completed his education in Moscow while living under the roof of his tea-trader uncle Aron Ginsberg. His father was already a produce dealer in the Cederberg, purchasing wild mountain Rooibos, and farm produce, such as rope tobacco and dried fruit.

A letter written on 8 September 1907 by the Assistant Chief Conservator of Forests in the Western Conservancy (conserved in the Cape Town Archives) details techniques of curing and processing Rooibos as follows: "The branches are first cut and collected; the leaves are then beaten off, moistened and rolled up tightly in sacking for a few days. After that they are dried in the open air and the tea is ready for market."

Benjamin Ginsberg saw how local people harvested and processed the Rooibos plants growing wild in the mountains of the Clanwilliam region. They chopped the shoots using an axe, crushed them with a mallet and "sweated" (oxidised) the bruised pieces in the hollows of stone reefs, followed by sun- drying (Cheney & Scholz, 1963).

The young Ginsberg became fascinated by this Cape herbal tea. He realised that the herbal drink cherished by the locals would find favour far beyond South Africa's borders and thus pioneered the commercial trading of this unique herb, aptly called "mountain tea". Ginsberg started buying Rooibos from people in the Cederberg area and reselling it in other areas. He also ran his own experiments placing „bruised' leaves in barrels to perfect the curing or fermentation of the tea, based on the Chinese curing techniques.

Later the technique used in the first tea estates in India was adopted for Rooibos, and leaves were placed in heaps to increase internal heat. This technique was recorded in several English tea manufacturing books which were published in the last decades of the 19th century and onwards.

The British soon mechanised the previously artisan craft tea-making process for black tea. Elements of this mechanisation were later adapted for Rooibos production, such as cutting the tea evenly with chaff-cutters, rather than with hand-axes.

The marketing of black tea evolved from being sold loose in tea chest or bags to being packed in small packets of tins, as a mark of selectivity and guarantee of quality. Consistency of flavour and quality became important. Benjamin Ginsberg wanted to keep up with these trends and sought to lift the standards of Rooibos and provide a higher quality and more consistent product. Rooibos tea, at the time, was often crudely made, with very little consistence in quality, taste and flavour. It contained shreds of wooden stalks and varying lengths of dried leaves, with large variations in colour and flavour. There was a critical need to refine the product so that the consumer experience would be pleasant and more

predictable. Ginsberg's background furnished him with the necessary experience to do this and bring a better-quality tea to market. He created the brand name “Eleven o'Clock” tea for his tea, recalling the colonial habit of „Elevenses", a mid-morning cup of tea. At the same time, he sought to create a strongly regional product of excellence and smoothness, building on local artisan expertise, lifting standards, and building a reputation amongst discerning tea drinkers.

The Eleven o’Clock brand is still popular in South Africa and the UK today (Joubert et al, 2008).

Growing interest in Rooibos followed and sales increased. As a result, unsustainable harvesting in the 1920s soon exhausted the limited availability of wild Rooibos, which was found only in sparse plant populations on the slopes and valleys of the Cederberg, its traditional harvesting area.

Around 1930, Ginsberg encouraged his friends, a local Clanwilliam doctor and nature lover, Dr Le Fras Nortier, who had become interested in “wild bush tea” and a local farmer, Olaf Bergh, to begin experimenting with Rooibos propagation. This presented a particularly difficult problem because of the plant's hard-shelled seeds. It was also difficult to find seeds and Nortier asked the local people, some of them his patients, to search for seeds in the sandy soils and collect some for him. A local woman brought him a matchbox filled with seeds and later Nortier learnt her secret. The woman would follow ants that were dragging Rooibos seeds to their nests. She then broke open the nests to collect seeds, always leaving some for the ants to survive (Green, 1949). This way of collecting seeds is still being used by some seed collectors.

Looking for a way to propagate the seeds, Nortier discovered that the seeds would only germinate if they were cracked open first – imitating the effect of mountain fires in dry climates, a common characteristic of similar Mediterranean climate plants seeds. It is thought that possibly Nortier's close friendship with the poet Louis Leipoldt, could have helped in accessing the information on hard seed propagation. In addition to being a native of Clanwilliam and lover of the Cederberg region, Leipoldt was also a keen botanist and also, just like Nortier, studied medicine in London. His studies in London were paid for by the great South African botanist, Professor Harry Bolus. Leipoldt was also a friend of the famous botanist Rudolph Marloth, whose wife was from Clanwilliam, and who had collected plants in the Cederberg. Marloth had written his doctoral thesis on "*The protective mechanisms employed by seeds against harmful agents*" and it could have been him who advised Nortier, directly or via Leipoldt, on possible germination procedures for scarifying Mediterranean-type hard-shell seeds with acid or sandpaper.

Nortier cultivated the first plants on the *Klein Kliphuis* farm near Clanwilliam. He learnt that the seeds should be sown in January and that the best time to transplant the tiny seedlings is just after heavy rain when more rain is due (Green, 1949). Nortier also inspired and encouraged local farmers to start cultivating Rooibos plants. Two more Rooibos pioneers who worked with Nortier were land owners William Riordan and Oloff Bergh, grandfather of the present managing director of Rooibos Ltd, Martin Bergh.

In her book, *In the land of the afternoon,* published in 1949, Lawrence G Green illustrates how deeply Rooibos is embedded in the history of the Cederberg region: *“*Some people find the "wild" flavour of bush tea a little startling. The people who grow it know how to brew it and I am glad that I had my first cup of bush tea in the inspiring atmosphere of the Cederberg Mountains. At the end of a day's hunting it seemed a magnificent drink. This is the Cederberg way with bush tea: Boil the water and pour one cup over the leaves. Let it stand for several minutes, drain off the water, then fill the pot with boiling water and allow it to infuse for fifteen minutes. Put it on the stove and bring it to the boil as often as you like. You may blend bush tea with China or Ceylon if you wish, but this is purely an economy measure in the cities. The bush tea connoisseur, way up in the mountains, will not tolerate a blend.”

Ginsberg's son, Henry Charles (Chas) Ginsberg, became known as the “Rooibos King” for his

contribution to domesticating the Rooibos plant and turning it into a major agricultural crop. In the early 1940s, he experimented with growing Rooibos on the farm Stillerus – the first time Rooibos had been grown in the mountains west of the Olifants River. He produced up to 750 bags per season on small parcels of mountain slope, and later laid out the first dedicated large-scale Rooibos plantations on two nearby high mountain plateau farms, namely *Die Berg* and *Môreson*. He was soon producing 6 500 bags annually. By 1950, half of all Rooibos produced was being grown on these three farms (*Stillerus, Die Berg and Môreson*), and a third to half of all seed was being collected there. He also developed new technologies for drying the tea and pioneered the use of large-scale curing courts. He disposed of the original chaff cutters his father had encouraged and introduced more sophisticated cutting machinery used by the tea industry in India and the tobacco industry at that time (Ginsberg, 1976 and the South African College Schools Old Boys' Union website - www.sacsobu.org).

Chas (HC) Ginsberg is widely recognised as the driving force that transformed Rooibos from a small-scale, local product sold in country stores into a nationwide product of much higher quality and bringing the product to foreign markets. He was also instrumental in encouraging major South African tea companies such as TW Becket (who initially distributed Eleven o‟Clock Rooibos), as well as Glenton and Mitchell to start brands such as Freshpak and Laager. He became Chairman of the Rooibos Tea Packers Association, a role he held for several decades. During this period, he continued the slow process of exporting tea to new markets, registering for the first time, overseas trademarks as early as 1955.

Joubert et al (2008) points out that commercial Rooibos tea farming started in earnest only after World War II. In 1948, the “Clanwilliam Co-operative Tea Company” was formed to cope with difficult market conditions – to help stabilise the industry and stimulate demand for Rooibos. However, the “Co-op” company soon lost momentum and direction when they launched a packed Rooibos tea in competition to their tea packer customers, which proved unsuccessful. This role of looking after the quality and marketing of Rooibos was taken over by the “Rooibos Tea Marketing Board” in 1954. The South African Rooibos Council (SARC), a non-profit company set up in 2005, currently looks after the interests of the industry in South Africa and abroad.

SARC has since its founding in 2005, supported research into various aspects of Rooibos, including quality parameters and health properties of Rooibos, as well as agricultural research focused on improving the crop quality and organic farming practices.

The first commercial green (unoxidised) Rooibos was produced in 2001 to meet the global demand for a product with a higher antioxidant activity than the traditional “fermented” (or oxidised) tea (De Beer and Joubert, 2002).

Extracts of Rooibos are increasingly used as an ingredient in ready-to-drink beverages and a variety of value-added and functional food products such as yogurt, drinking yogurt, jam and „instant cappuccino' (Joubert and De Beer, 2011 and 2012).

An exciting Rooibos innovation in the form of an espresso, the first tea espresso in the world, was introduced to coffee shops and retail outlets during 2006.

Aspalathus linearis is one of several Cape fynbos plants that have traditionally been used in South Africa to brew tea and cure ailments (Watt and Breyer-Brandwijk, 1932). The plant has made a successful transition from a wild to a cultivated crop and is one of relatively few economically important fynbos plants to date (Morton, 1983). Today, Rooibos is an important part of the South African economy and likely to become even more significant in future. The sustainable exploitation of this native legume can make a significant contribution to the alleviation of poverty in Rooibos- producing regions in South Africa (Sprent, 2010).

Present-day marketing of Rooibos is moving away from its commodity status and positions it as a rare and special niche product that is naturally caffeine free, that can be enjoyed all-day and at night-time. Rooibos is now universally marketed by specialty tea companies, often with an emphasis on its unique Cape/Cederberg story and origin.

4.4 The reputation of Rooibos – an icon of South Africa

Rooibos is widely recognised today as a cultural icon of South Africa and part of the country's natural heritage.

Rooibos has become popular beyond South Africa because of its fruity, sweet taste and its caffeine-free, low tannin, antioxidant-rich status (Erickson, 2003) and is increasingly recognised as a part of a healthy lifestyle (Watt and Breyer-Brandwijk, 1962; Van Wyk and Gericke, 1993 and 2000; Van Wyk and Wink, 2004, Joubert et al, 2008).

According to Morton (1983), "While Rooibos tea is first and foremost, a beverage, South African consumers and their physicians regard it as not only as harmless – even to infants, and cardiac and kidney patients – but beneficial to the system, improving the appetite, calming digestive disorders, reducing nervous tension and promoting sound sleep."

As a traditional folk remedy, Rooibos is still used today to treat asthma, colic, eczema, headache, nausea, mild depression, anxiety, irritability and insomnia. It is generally regarded as a healthier alternative to caffeine-containing beverages (Joubert et al, 2008).

In 1968 Mrs Annetjie Theron, a South African mother struggling with an allergic infant, put the spotlight on Rooibos with her claims that it soothed away her baby's colic. She published a book on her findings called *Allergies: An Amazing Discovery* and went on to launch a full range of health and skin care products with Rooibos as the basic ingredient – and exported this range around the world (Erickson, 2003; Joubert and Schulz, 2006). Snyckers and Salemi (1974) attributed the anti-allergic effect of Rooibos when administered to babies to the antispasmodic properties of quercetin and luteolin that would have a calming effect on the stomach.

While Rooibos is increasingly included in various skin care products, its huge potential as a phyto-pharmaceutical has not been fully exploited (Joubert & De Beer, 2011).

Despite becoming a popular and trendy beverage around the world, Rooibos remains very affordable in South Africa and therefore many South Africans, including those living in poor communities, rely on Rooibos for its perceived curative properties. Surveys conducted by Oldewage-Theron et al (2005) showed that Rooibos was one of the ten most frequently consumed foods in an informal settlement in South Africa.

Traditionally, in South Africa, Rooibos was brewed from loose leaves. Today, most Rooibos drinkers prepare the hot beverage by infusing one tea bag (~2.4 g) per cup of freshly boiled water in a tea pot, with an infusion time of 2 to 5 minutes. Rooibos can be enjoyed with or without milk and sugar or honey. Various iced Rooibos drinks, sometimes blended with fruit juices, have also become very popular.

Rooibos has become synonymous with the Cederberg region and several Rooibos farms offer accommodation allowing visitors to get to know the area and its rich biodiversity. The Rooibos fields contrast the ruggedness of the surrounding mountains, where the area's unique rock formations and rock art heritage are also major attractions. Certain towns in the heartland of the production area have become synonymous with Rooibos and are visited by many tourists specifically for this reason.
Tourists also visit the Rooibos plantations and factories in some of the scenic villages in the area. Clanwilliam, the town at the heart of the Rooibos industry, is one of the oldest towns in South Africa

(www.clanwilliam.info).

Numerous farms stalls, restaurants, and gift shops in the area offer a wide range of Rooibos blends, such as combining Rooibos with indigenous herbs such as buchu, honeybush or sutherlandia. They also sell a wide range of Rooibos-based cosmetic products and a variety of edible items such as shortbread, fudge, sweet and savoury sauces, salad dressings, marinades and even liqueur made with Rooibos.

Several tour operators, Rooibos estates and Rooibos processing companies offer Rooibos tours and tastings. Some offer ecotourism opportunities including guided Rooibos safaris allowing guests to follow the Rooibos plant on its journey from the plantation all the way to and through the processing plant to its final packaged form. They also offer fynbos walks, allowing visitors to view natural fynbos and biodiversity-friendly Rooibos farming practices.

The annual Cederberg Arts Festival in Clanwilliam is sponsored by one of the local Rooibos companies. The festival celebrates South African art, music and food, with Rooibos featuring prominently at the festival's tables (www.cederbergfees.co.za).

The Clanwilliam Town Museum, housed in a 200-year old former jail, has a small display dedicated to the history of Rooibos where some of the early Rooibos samples collected by Dr Le Fras Nortier, a South African medical doctor who promoted the agricultural potential of Rooibos to the world during the 1930s, can be seen, as well as some of the earliest Rooibos tins and boxes (www.clanwilliam.info).

5 Scientific research findings adding to the reputation of Rooibos

One of the earliest Rooibos scientific studies on record was published in 1949 in the journal "Farming in South Africa" and focused on the composition of Rooibos infusion (Reyneke et al, 1949). More than 100 research articles related to the science and health of Rooibos have been published in scientific journals over the last 60 years.

Scientific studies support the interest in and popularity of Rooibos and add valuable new knowledge about the potential applications of Rooibos to promote health and well-being. Several research groups – in South Africa and around the world – continue to investigate the chemistry, biochemistry, bioavailability and health properties of Rooibos. In South Africa, the research is done at the country's Medical Research Council and Agricultural Research Council, often in collaboration with top research teams around the world.

While most of the findings to date, as summarised below, are based on *in vitro* results and animal studies, some researchers have also published findings of human studies (Joubert & De Beer, 2011). More human studies are required to verify these health properties in humans.

5.1 Rooibos and chronic/lifestyle diseases

- The ability of Rooibos to prevent and slow down many different kinds of cancer has been highlighted by many research teams (Marnewick et al, 2005; Van der Merwe et al, 2006; Snijman et al, 2007; Awoniyi et al, 2012).
- Recent human studies have illustrated the potential of Rooibos and its constituents to prevent and treat heart disease (Cha et al, 2009; Marnewick et al, 2011; Persson et al, 2010). Marnewick et al (2011) demonstrated that daily consumption of six cups of Rooibos tea over a six-week period improved the lipid profile and redox status in adults at risk of developing cardiovascular disease, supporting its reputation as a health-promoting beverage.
- Rooibos has antioxidant properties, chemopreventive potential and immune modulating effects (McKay and Blumberg, 2007; Ichiyama et al, 2007).
- The calming effect of Rooibos on the digestive system has been proven in animal studies

(Gilani et al, 2006), as well as its ability to reduce inflammation and reduce oxidative stress (Baba et al, 2009).

- A 2012 study demonstrated that Rooibos has the potential to promote longevity decreased oxidative damage in living cells, and that aspalathin could target stress and ageing related genes (Chen et al, 2012). This follows on an earlier study pointing towards the potential of Rooibos to delay ageing in birds (Juráni et al, 2008).
- Rooibos also acts as an effective bronchodilator, with an associated effect on lowering blood pressure and relieving spasms (Khan and Gilani, 2006).
- Researchers have found that Rooibos infusion is able to significantly increase antioxidant levels in humans, thereby stimulating the body's internal redox network (Villaño et al, 2010).
- A study published in 2011 (Breiter and Laue et al, 2011) confirmed that the active components in Rooibos tea can be absorbed and metabolised by the human body.
- Animal studies are pointing towards the potential role that Rooibos can play in preventing and controlling diabetes (Uličná et al, 2006; Kawano et al, 2009). Researchers have more reason to be optimistic about the anti-diabetic potential of Rooibos after studies confirmed that aspalathin (or aspalathin-enriched tea) is able to lower glucose levels in the blood (Muller et al, 2012 and Kawano et al, 2009).
- A group of Dutch researchers has demonstrated for the first time that Rooibos has strong anti-viral activity against rotaviruses that cause serious infections, often with fatal consequences (Knipping et al, 2012).
- Promising research about the ability of Rooibos compounds to inhibit stress is taking place at Stellenbosch University (Schloms et al, 2012).

5.2 Cosmetic applications of Rooibos

- Rooibos can reduce ultraviolet radiation damage and photo-ageing of the skin (Van Niekerk and Viljoen, 2008).
- The effect of Rooibos on cell division (Lamoˇsova et al, 1997) and dermatological conditions (Shindo and Kato, 1991) also led to its increasing popularity for cosmetic use.
- Tiedtke and Marks (2002) found that Rooibos had anti-inflammatory and anti-microbial properties in cosmetic applications, and that hair growth and condition were improved with the use of hair care products containing Rooibos.
- The indication that topical application of aqueous Rooibos extract helps for skin problems such as eczema and nappy rash has resulted in development of special skin creams for babies (Joubert and Schulz, 2006).

6. Practices in the production of Rooibos and green Rooibos (method of obtaining the product)

6.1 Cultivation and production practices

Aspalathus linearis is generally produced under dry land conditions as the plant is adapted to dry, hot summers. These environmental conditions influence the chemical composition of Rooibos, in particular the level and type of polyphenols found in the final product. For this reason, whilst irrigation may be used, it must cease for a minimum of one month before harvesting starts.

Rooibos producers must adapt their land management and cultivation practices to the harsh conditions of the region. To avoid wind and water erosion they use the following practices:

- Planting across the slope and contour of a production area.
- Planting cereal cover crops to protect young Rooibos plants.
- Ensuring that there is sufficient vegetation cover at all times to prevent soil erosion by wind.
- Alternating natural vegetation strips of at least 10 m wide with cultivated *Aspalathus linearis* strips of no more than 30 m wide. The strips must be oriented across the prevailing wind direction that causes wind erosion.

- Applying intercropping by alternating planted and unplanted rows from one production cycle to the next or resting the soil for a minimum of two years before replanting to *Aspalathus linearis*.
- Establishing cover crops during rotational periods to help restore the organic content of the soil and provide a healthy environment for desirable soil micro-organisms.
- Favouring rolling or brush-cutting when clearing areas for cultivation instead of ploughing.
- Ploughing only when there is enough soil moisture to prevent erosion.
- Employing conservation tillage techniques to promote organic content of soil, as well as to retain vegetation cover and improve the moisture content of soil.

In addition to the practices listed above, fire may not be used to clear areas for cultivation as it destroys the organic content of the soil.

6.2.1 Harvesting

The Rooibos plant is harvested annually during the dry summer months in South Africa from November to May. During harvesting at least 20% of the plant material must be left on the plant.

Due to the importance of wild Rooibos plant populations for the future sustainability of the industry, the harvesting of wild-growing Rooibos plants must follow the guidelines laid down in "The Sustainable Harvest of Wild Rooibos" (Malgas and Oettle, 2007), including:

- The harvesting of wild Rooibos plants may only be done by hand, using a clean, sharp sickle in such a manner that it prevents the breaking of plants.
- Plants younger than three years old may not be harvested.
- Re-seeding varieties of wild Rooibos plants may be harvested annually, but re-sprouting varieties may only be harvested every second year to allow the plant to build up reserves and to reproduce. Annual harvesting of re-sprouting varieties is only permitted when the plant has grown well the previous season, and above average rainfall facilitates re-growth. In general, re-sprouters should be harvested more lightly than re-seeders.
- Wild Rooibos bushes must be moderately harvested – only 50 – 70% of the upper, leafy parts of the plant may be harvested and the lowest point harvested should be about 2.5 cm higher than the previous harvest cut. Only those parts of the plant with a branch thickness of no more than 2 – 3 mm in diameter are allowed to be harvested.
- Harvesting may only be done only during the summer months from November to May, since winter harvesting limits the plant's ability to reproduce the following summer and makes it more vulnerable to fungal infections.

6.2.2 Processing of Rooibos at the tea court

A tea court (or processing yard) is a drying facility consisting of a concrete or rock slab surrounded by a stone, brick or concrete wall. The tea court must be within the delimited area but can be either on-farm or in a centrally located area (such as a town) convenient within reach of several producers. The tea court can either be privately owned by a farmer or processor or cooperatively owned by farmers and/or processors.

The tea master is the person responsible for supervising the tea court processing and will be in charge of the following rules and practices:

- The freshly harvested plant material must be delivered at the tea court within 72 hours of being harvested.
- A mechanical cutter is used to reduce the stems and leaves so that they are between 1 – 10 mm long.
- The freshly cut material is placed in row-like heaps on the concrete surface under the sun.
- These heaps are wetted until 60% of the total weight of the mixture consists of water.

- The wet leaves are bruised, and the heaps are turned at regular intervals to facilitate the aerobic oxidation process. The tea master must make sure that the temperature does not go higher than 42°C.
- No catalyst may be used to enhance the oxidation process.
- The heaps are allowed to "ferment" between 12 – 16 hours.
- When the Rooibos has a sweet odour and the colour is typically brick-red, the oxidised product is spread out thinly on the tea court to dry the tea and stop the oxidation process. A surface area of 1 000 m^2 is necessary to dry one ton (1 000 kg) of Rooibos.
- The Rooibos is left to dry in the sun until the moisture content is below 10%.
- The dried Rooibos is then collected, sealed and stored under a roof in a dry place free of insects and any contaminating factors that could affect the flavour of the Rooibos infusion (commonly referred to as Rooibos tea).

Specific know-how and expertise that are associated to the production of high quality Rooibos have been documented as follows by Ginsberg, 1976: "There is an art to making good tea, and grading is very strictly controlled. The tea maker carefully watches the colour, texture and moistness of the tea until the desired „soapy' feel is attained. A typical method is to take a handful of the wet, bruised tea and squeeze it until the hand forms a fist, and if the moisture level is correct, a tiny trickle of „juice" runs through the gaps between the base of the fingers."

6.2.3 Processing of green Rooibos

To produce green Rooibos, it is critically important that the oxidation process must be avoided completely. Therefore, the freshly harvested material must arrive at the processing plant within five hours of being harvested. A mechanical cutter is used to reduce the stems and leaves to the desired size and the plant material is then immediately spread out thinly on the tea court and allowed to dry. The green Rooibos is then collected, sealed and stored similar to dried Rooibos.

7. Traceability aspects of Rooibos production

7.1 Export requirements

South African standards regarding the safety and hygiene of agricultural food products of plant origin destined for export are governed by the Agricultural Product Standards Act (Act No.119 of 1990, SA Government Gazette). In line with this legislation and in conformance with SAGAP (South African Good Agricultural Practices) requirements, each producer must have a management system in place to keep record of plantation names and locations, spray records, harvest dates and harvest loads, so that they are able to pinpoint from which field each Rooibos lot originates.

All processors must be registered under the HACCP system which ensures that good manufacturing practices are implemented, and a risk assessment is done to identify the relevant critical control points. Monitoring systems must be in place to manage food safety risks identified. Rooibos deliveries to processors are managed according to the raw material receiving procedure under the processor's specific good manufacturing practice (GMP) for raw materials. A representative sample is taken from the raw material load, graded and retained as per the procedure of the processor.

According to the grading of these samples, different farmer lots are blended together, screened, heat-treated with steam to lower microbial counts, and dried to below 10% moisture. The blend is identified according to the unique numbering system of each processor and should be linked to each processor's traceability management plan to ensure that final products can be traced back to the specific farm loads used in the final product.

A representative sample of the final product blend is offered to the Perishable Products Export Control Board (PPECB) for inspection with specific reference to the specifications mentioned in the export regulations for Rooibos and Rooibos blends, as stipulated by the Agricultural Product Standards Act of 1990.

The PPECB, established in accordance with the Perishable Products Export Control Act (Act 9 of 1983, SA Government Gazette), is the South African statutory body responsible for the export inspection and control of all agricultural products originating from plants. Once approved, the PPECB will issue an export certificate and phytosanitary certificate for the specific batch to be exported.

7.2 General traceability requirements for export as well as domestic sales of Rooibos

- All Rooibos producers, buyers, processors, packers, branders and exporters must be registered on the Food Business Operator (FBO) database of the Department of Agriculture, Forestry and Fisheries, and be in possession of the required code numbers. The rules of the system must be applied in terms of keeping the FBO data updated.
- Each consignment of Rooibos must be clearly marked with the FBO numbers of the sellers, the buyer and the next level of buyers in the "one down, one up" reporting system required by the system (except for producers who only use their own and the buyer's number), linked with the unique consignment identification of the buyer which contains the consignment details.

8. Inspection and control structure

The South African Rooibos Council will outsource inspection and certification services of Rooibos to independent ISO 65 accredited certification agencies – either from the private sector and/or the public sector as a statutory body – with sufficient capacity as well as relevant food and agricultural related expertise. These may include:

- NSF-CMi Africa (Pty) Ltd
  Tel +27 (0)21 880 2024; Website: www.nsf-cmi.com/southafrica/
- SGS South Africa (Pty) Ltd
  Tel +27 (0)11 680 3466; Website: www.sgs.com
- Ecocert South Africa Afrisco (Pty) Ltd
  Tel +27 (0)21 461-1558; Website: www.ecocertsouthafrica.com
- PPECB (Perishable Products Export Control Board)
  Tel +27 (0)21 930 1134; Website: www.ppecb.com

9. The labelling of Rooibos ("Rules of use" for "Rooibos")

The name "Rooibos" can only be used to refer to the dry product, infusion or extract that is 100% pure Rooibos – derived from *Aspalathus linearis* that has been cultivated or wild-harvested in the geographic area as described in this application.

Rooibos may be blended with teas, infusions and other products, whether or not for human consumption. The labelling of such products must conform with the rules applicable to labelling of products in the territory where the product is marketed.

As a guide, the following are considered by the South African Rooibos Council as compatible with registration of Rooibos:

- To carry as product designation "Rooibos" the final product must contain 100% *Aspalathus linearis* or at least adhere to the statutory standard.
- If it is a Rooibos blended tea or infusion, Rooibos can be used as the main descriptor ("Rooibos

<<other product>>") provided that:

- Rooibos is the main ingredient
- The exact percentages appear on the label/packaging
- The final product must still be recognizable as Rooibos as characterized in the description of the product.

- If it is a blended tea or infusion, it can be called "<<other product>> and Rooibos blend" as descriptor only if it contains Rooibos and on conditions that:
    - Rooibos provides a distinctive character to the product.
    - The exact percentage of the Rooibos content appears on the label/packaging.
    - The product with the highest percentage appears first on the label.
- Rooibos flavoured tea or infusions with liquid flavourants (flavoured Rooibos) can be called "Rooibos <<liquid flavourant>>" on the conditions that:
    - Rooibos is the main ingredient (after water).
    - The exact percentage of Rooibos content appears on the label/packaging.
    - The final product must still be recognizable as Rooibos as characterized in the description of the product.
- Following guidance from the SA Rooibos Council other products (for instance extracts, soaps, cream, yoghurts, liquor, etc.) may be called "Rooibos <<other product>>" only if it contains Rooibos on the conditions that:
    - "Rooibos" (or *"Aspalathus linearis"* appears on the list of ingredients.
    - It can be proven that Rooibos adds to the characteristics of the product.

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