

## **INTELLECTUAL PROPERTY RIGHTS APPLICABLE TO FRUIT TREES AND THE LIKELY EFFECTS ON REGIONAL AND GLOBAL AVOCADO INDUSTRIES**

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In the past, avocado cultivars have been selected and made available for all to use freely. However, capital investment into breeding, selection and testing programmes have become excessively high and methods to recover some of these costs have had to be devised. The registration of plant breeder's rights and patents on fruit cultivars and rootstocks has been practiced for most of the last century, but it is only relatively recently that the use of these rights for commercial gain has been pursued. The most well known successful example is the Pink Lady™ apple. In avocado, the example of Hass, which had a plant patent registered in the 1940's, is discussed. The slow speed of development resulted in Hass' commercial success long after the patent had lapsed. More recent examples of protected avocado cultivars e.g. Lamb Hass, Merensky 2 Dusa® and Gem, and their commercialization strategies are discussed. Different models for current and future avocado cultivar releases and commercialization, and their likely impact on the world avocado industries are analyzed.

### Keywords

Plant patent, plant breeder's rights, trademarks, royalties, grower clubs, marketing.

## **DERECHOS DE PROPIEDAD INTELECTUAL SOBRE ÁRBOLES FRUTALES Y SUS PROBABLES EFECTOS EN LA INDUSTRIA REGIONAL Y MUNDIAL DEI AGUACATE**

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En el pasado, se seleccionaban variedades de cultivo del aguacate y se disponía de ellas libremente. Sin embargo, la inversión de capital en programas de cultivo, selección y pruebas, elevó los costos de manera excesiva y fue necesario idear métodos para recuperar en parte dichos costos. El registro de derechos y patentes de variedades de cultivo y patrones, por parte de los productores de plantas, se realizó durante gran parte del siglo pasado, pero hace relativamente poco tiempo se ha llevado a cabo el uso de tales derechos para obtener ganancias comerciales. El ejemplo exitoso más conocido es la manzana Pink Lady™. Respecto al aguacate, tenemos el ejemplo de la variedad Hass, que

registró una patente de planta en la década de 1940. La lentitud del desarrollo provocó que el éxito comercial de Hass tuviera lugar mucho tiempo después del vencimiento de la patente. Se analizan ejemplos más recientes de variedades de cultivo del aguacate protegidas, como Lamb Hass, Merensky 2 Dusa® y Gem, además de sus estrategias de comercialización. Respecto a las variedades de aguacate, se examinan distintos modelos actuales y futuros para su producción y comercialización, y su probable impacto sobre la industria aguacatera mundial.

## 1. Introduction

In the past, the international avocado industry was generally free to use any rootstock or fruiting cultivar for production and breeding purposes. Very few cultivars were protected in any way, and those that were, were not commercialised with enough time for the owner to benefit fully. This has meant that the world avocado industries have had very little exposure to intellectual property rights. However, the expense of breeding and selection research has forced institutions to try to recoup some of their costs by legally protecting their genetic material and charging a royalty for its use.

What is understood by intellectual property (IP) and intellectual property rights (IPR)? In contrast with tangible property (land, material goods, etc.), IP is the property of the mind and is intangible. While the ideas are in the mind, they are protected and cannot be used by others, but once they are exposed, these ideas could be used by anybody if they are not adequately protected. Just as there are property rights which give the ability to protect tangible property, so there exist legal methods to protect IP. These rights give the owner of the IP the opportunity to use the ideas or genetics without competition for a fixed period, whereafter others may use the IP on the condition that royalties are paid to the owner (Smiler and Erbisch, 2004).

The difference in time taken to fruiting between annual and perennial crops is reflected in the time taken for the fruit evaluation process. Experience gained at Westfalia Technological Services shows that it takes a minimum of 12 years, but more realistically 15 to 20 years, from the first selection to commercial release of a promising avocado cultivar or rootstock. Therefore the correct timing of registration of plant breeders rights (PBR) and trademarks is of the utmost importance.

A detailed study of IP will be a long exercise, and therefore the objective of this paper is to briefly review the IPR applicable to fruit crops and analyse the effects of the exercising of such rights on the owner, the administrator of the rights and the fruit producer with special emphasis on avocados.

## 2. Main types of intellectual property used in agriculture

Although there are many different types of IP protection such as trade secrets, copyright, etc., for the purposes of this paper, only the most important protection

mechanisms for plant varieties are discussed: trademarks, plant breeder's rights or plant variety protection and plant patents.

## 2.1. Trademarks

Any letters, words, phrases, logos, symbols, etc. used in commerce to identify the source of goods may be registered as a trademark. Although the traditional function of trademarks is to identify the origin or ownership of goods, some insist that the primary purpose is to protect a company's investment in research and development, marketing and the reputation of the company. A trademark can be used to ensure consistent levels of quality (Smiler and Erbisich, 2004). An example in the fruit industry is Cripps Pink apples which could only be sold as Pink Lady® when the blush, size and quality exceed certain standards (Meihuizen<sup>1</sup>, Pers. Comm., 2007).

A trademark must be used within a reasonable time-span; if not used, the registrar may cancel the registration and another party could apply to use it. Once in use, trademarks confer a perpetual right, unlike plant breeder's rights or patents, and this is another major advantage to using one. In essence, this means that once plant breeder's rights have expired, the trademarked brand can continue in perpetuity. Renewal is usually every 10 years (Smiler and Erbisich, 2004).

## 2.2. Plant Breeders Rights (PBR) or Plant Variety Protection (PVP)

The registration and granting of plant breeders rights gives discoverers of new varieties an incentive to develop new varieties, which must be "new, distinct, uniform and stable" (UPOV, 1991). Protection for tree crops is 25 years and for a certain period (8-10 years), the holder of the PBR certificate may have sole and exclusive use of the material. After this initial period, the holder must make the material available for use by others under license. The rights may be sold outright, licensed to an agent or nursery, sublicensed to growers, packers and marketers, or exploited in any legal way during the period of protection (Smiler and Erbisich, 2004).

The PBR laws of various nations are harmonized through an international treaty, the Union for the Protection of New Varieties of Plants (UPOV), which gives breeders the opportunity to apply for PBR up to 6 years from first distribution or sale (UPOV, 1991; Barton, 2004).

## 2.3. Plant Patents

The USA is unique in that plant breeders have the option to apply for a plant patent on their novel new genetic material. The advantage of a plant patent over

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[www.topfruit.co.za](http://www.topfruit.co.za) Administrator of Pink Lady® in Southern Africa.

PVP variety protection in the USA is that the patent grants much wider protection than the PVP. Newly discovered asexually propagated plant varieties (except potatoes) are usually patented, rather than following the PVP route. It has also become normal practice for US breeders to seek patent protection for sexually propagated varieties as a supplement to PVP which, if granted, gives the breeder extended protection. Plant patents must be filed within 1 year of the first publication of the material to be protected, and give 20 years of protection from date of grant (Barton, 2004) compared to the 25 years of protection of a UPOV PBR. This short period in which plant patents are allowed to be applied for, places a responsibility on owners of genetic material to think carefully before allowing researchers to publish results which include the cultivar name of genetic material with potential for plant patent protection.

### 3. Some examples of intellectual property development in fruit crops.

There has been a long history of IP protection in flower crops, but also in annual agronomic crops and perennial fruit trees and vines. Three examples in fruit crops are as follows:

#### 3.1. 'Hass' Avocado

An interesting case study is that of the world's most important avocado cultivar at present, Hass. The original 'Hass' tree was a chance seedling planted in 1925 by Rudolph Hass, a postman, in La Habra Heights, California. Mr. Hass applied for a patent and this was granted in 1935 and was the first patent to be granted in California for a tree. The H. H. Brokaw Nursery had the exclusive right to propagate the trees, but avocado growers at the time would buy one or two trees and then use these as budwood source to regraft the rest of their orchards, thus disregarding the patent status of Hass. Nevertheless, Rudolph Hass made about \$5 000 in royalties from his patent (Stradley, 2004).

The cultivar only became the important cultivar that it is today during the 1970's, long after the patent expired in 1955, and points to a common problem with marketing and control of patented material of perennial fruit crops. This mistake has been repeated by others who have patented a unique fruit, but not protected it fully by means of other IP legislation, and not developed the true potential of the fruit before the patent or protection had lapsed.

#### 3.2. Pink Lady® Apple

The Pink Lady® apple is probably the most well known success story for protected cultivar development. It was developed in Western Australia under the cultivar name Cripps Pink; the name Pink Lady® is a trademark. The fruit is grown and marketed in a "grower club" under conditions laid down by the owners. There are certain standards of quality and colour which must be met, and sub-standard fruit may only be sold as Cripps Pink. Pink Lady® sales may only take place under authorization of the owner, and royalties are

payable on receipt of the nursery tree as well as per carton of fruit. Pink Lady® cartons are standardized worldwide in keeping with the owners' merchandising strategy (Gapper, 2004).

### 3.3. ZESPRI™ Gold Kiwi Fruit

Another case where mistakes were made early on in its development, but later rectified, is the case of kiwifruit. In 1904 some Chinese gooseberry (*Actinidia sinensis*) seeds were brought into New Zealand. A horticulturist, Hayward Wright selected a promising plant in 1924 and called it 'Hayward' kiwifruit. He failed to legally protect the variety. In 1952 the first Hayward kiwifruit were exported to England. Since then kiwifruit, and especially 'Hayward', has been grown in many countries across the world, with no financial or other recognition to the inventor. So the New Zealand farmers went back to the drawing board (Dilanchian, 2006).

The marketing company ZESPRI International, which is owned by about 2700 kiwifruit growers, was formed in 1997 with negotiated rights to all kiwifruit selections made by HortResearch, a New Zealand government body. The selection Hort16A was granted plant breeders' rights, and ZESPRI registered its trademark in New Zealand and internationally. After this, Hort 16A was released to the NZ market as ZESPRI™ Gold (Dilanchian, 2006).

The success of ZESPRI™ Gold is attributed to the fact that individual growers are licensed to grow the variety directly with ZESPRI International, and there is no intermediary in different countries. All marketing and sales of ZESPRI™ Gold are undertaken exclusively by ZESPRI International, resulting in excellent control of quantity and quality of fruit entering the different markets (Martin and Luxton, 2005; Dilanchian, 2006). This also illustrates that IP lawyers must get involved at the pertinent time so that the correct protection measures are in place before international release of the cultivar and that exclusivity of marketing should be strongly considered.

## 4. Commercial development of the protected avocado rootstock variety Merensky 2 (Dusa®).

The list of avocado cultivars which have IP protection is expanding rapidly (Table 1).

Royalties have traditionally been collected by nurseries for payment to the owners of the IP rights on a per nursery tree basis, but further royalties on production are becoming the norm.

### 4.1. The process followed by Westfalia

The process from selection to commercialisation that Westfalia (Fig.1) used in this case gives an idea of the intensity of activities which must take place. Many mistakes were made along the way, as this was mainly a trial and error process. However, in the end, commercial production was achieved in a reasonable time,

bearing in mind that protection by plant breeders' rights is for 25 years and that for US plant patents is 20 years.

The avocado rootstock Merensky 2 (Dusa®) was selected in the early 1980's and was propagated and evaluated at Westfalia Estate in a variety of rootstock trials (Botha, 1991). During the late 1980's to early 1990's budwood of the new promising rootstocks was given to University of California to evaluate (Menge, 1998; 2002). The first pre-commercial trial of Hass on the new Merensky 2 (Dusa®) rootstock was planted in South Africa in 1993. The results were very promising, with Hass on Dusa® producing consistently about 30% more than Hass on Duke 7 (Roe *et al.*, 1996; 1997; 1998; Roe and Morudu, 1999), and in 1998 South African PBR were applied for. PBR were granted for South Africa in 2001. The rootstock was doing very well in California under conditions of *Phytophthora* and salinity, and therefore a US patent was applied for in 2001 and granted in 2005. In South Africa, the first commercial orchards were planted at Westfalia in 2002, with exclusive propagation rights given to Westfalia Nursery. Trademarks were taken out on the Dusa® name and other key phrases.

Commercial tree sales of Merensky 2 (Dusa®) to other South African growers started in 2002 and the rights to propagate and commercialise internationally were negotiated with Brokaw Nursery LLC for the Americas, Europe and Morocco, ANFIC for Australia, and New Zealand Avocado Industries Council for New Zealand. Westfalia Technological Services acts as self-agent in the rest of the world. Large test plantings have been established in Australia and these are also planned in New Zealand. First commercial sales in California were made in 2004. By the end of 2006, 280 000 Dusa® rootstocks had been sold in South Africa, making it the predominant rootstock in the country. International sales totaling 101 500 trees in California and about 2000 in Australasia were also achieved. At the same time, Brokaw Nursery LLC distributed material to Chile and applied for legal protection in Chile, Peru and Mexico. Westfalia and Brokaw Nursery LLC became part sponsors of a large clonal rootstock trial in Chile initiated by the Catholic University, Valparaiso, in 2006.

#### 4.2. Lessons learnt from this whole process?

- 4.2.1. Avoid the early publication of data about any new cultivar until after protection has been applied for, especially if considering a USA Plant Patent. This is important for researchers to keep in mind. Code numbers should be used when publishing scientific papers.
- 4.2.2. Once the owner is sure of the material's benefits, protection should be applied for and the testing and development must then proceed rapidly, otherwise many years of the protected period may lapse before a royalty return can be achieved.
- 4.2.3. Always keep in mind the time left to protect the material in other countries. US patents allow 1 year from first publishing (Smiler and

Erbisch); UPOV countries allow 6 years from date of first commercial distribution or sale of the material (UPOV, 1991).

4.2.4. Use trademarks for complementary protection of the material as this will extend the life of the IP.

4.2.5. Protect only the best material and reject material that was originally thought to be good but has not lived up to expectation as early as possible as their legal protection could become costly with no or low income potential.

4.2.6. The grower is the one who pays the royalty but is also the first to make money from the protected cultivar due to higher prices achieved for his product. Usually the first to use the new technology earns the most. The payback to the owner and the grower club administrator is more long term and is not guaranteed.

## 5. Future trends

Protected avocado cultivars, both rootstock and fruiting cultivars, have thus far attracted only once-off tree royalties. Production royalties have not been applicable for avocados. However, observations in other fruit industries such as apples, kiwifruit, citrus and strawberries *inter alia*, indicate a shift to production royalties over and above the tree royalties. This trend is expected to become established for new avocado fruiting cultivars and Westfalia has already encountered this in July 2006, when the University of California (UC) appointed Westfalia Fruit Estates as its sub-Saharan Africa exclusive Master Licensee for the cultivar '3-29-5' (also known as Gem) on the basis of tree royalties and production royalties. All classes of fruit are included in the royalty structure including those sold for processing. There seems to have, therefore, been a conscious change in policy by the UC to maximize royalty returns from their avocado cultivars outside the USA, in order to get some return on their investment; other owners of avocado genetic material are expected to follow suit.

European and UK supermarkets and multiples, who dominate the markets in Europe, are looking for opportunities to differentiate themselves from their competitors and the marketers of protected cultivars should use this as leverage in their price negotiations. New avocado cultivars will be grown by grower clubs with exclusive marketing rights. It is expected that these grower clubs will make more use of global production areas to ensure 12 months of supply to specific exclusive markets at a premium price. The grower will have to decide whether the premium acquired for the protected cultivar is worth the royalty deducted on his behalf.

An unfortunate trend will be that growers in countries with adequate IP protection laws will have access to the newest avocado genetics and will progress steadily, while in those countries that do not have protection, growers will not have legal access to this material and will continue to fall behind even further.

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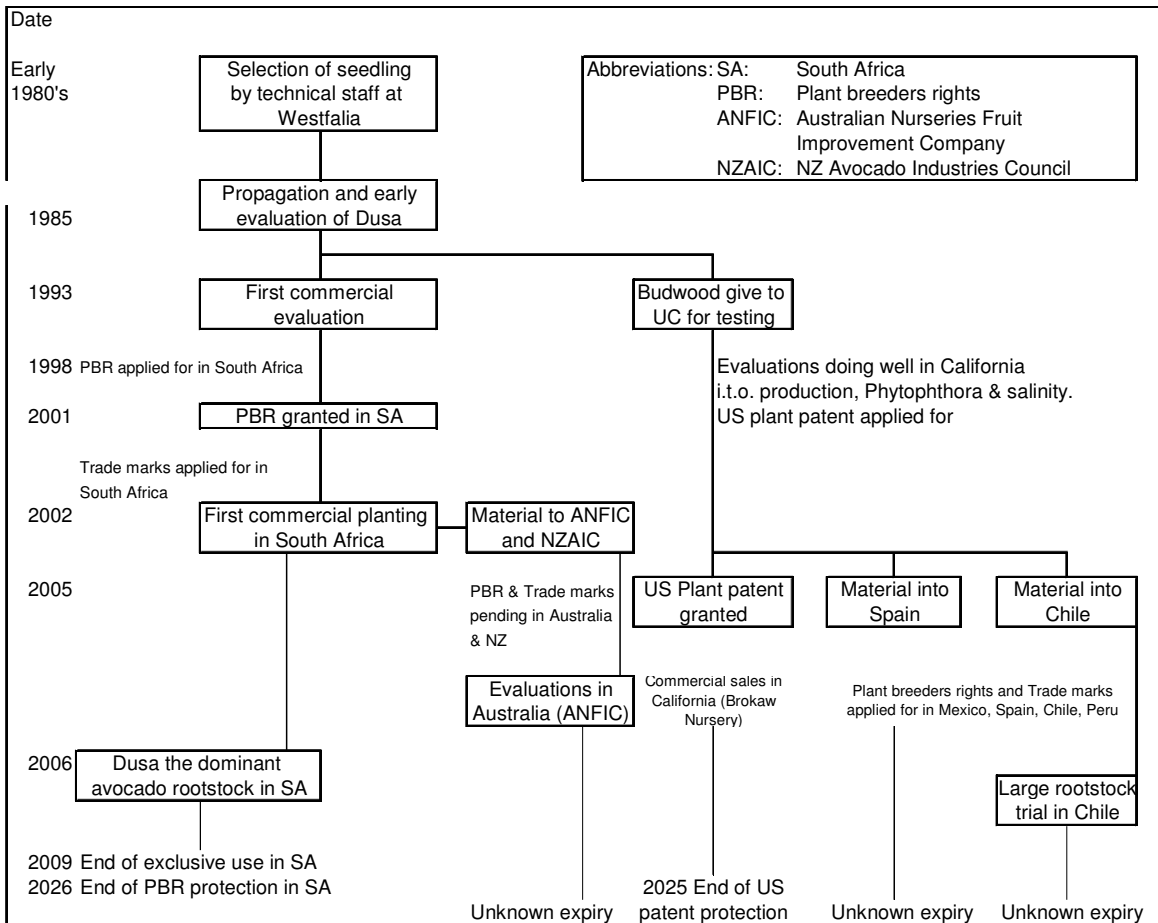
## Tables and Figures

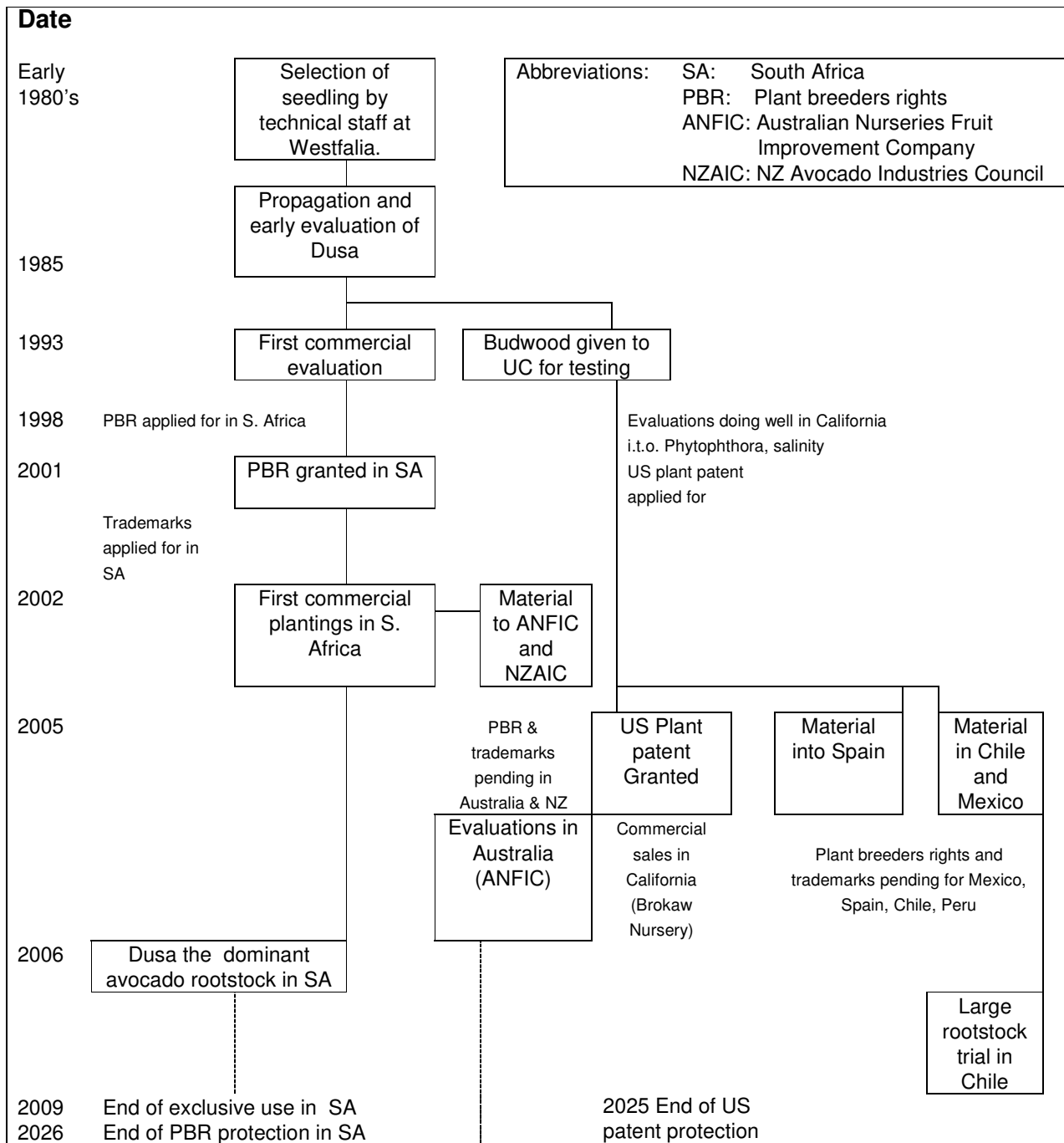
Table 1: Avocado cultivars which presently have intellectual property protection in different parts of the world. (modified from Tucker<sup>1</sup>, Pers. Comm., 2007). This is not a complete list and protection is pending for other cultivars in many other countries.

Tabla 1. Variedades de aguacate que presentemente tienen protección intelectual en diferentes partes del mundo. Esta lista es incompleta y la protección es pendiente para otros cultivars en muchos otros países.

Cultivar	Owner	Where protected	Type of cultivar
Barr Duke	University of California	USA	Rootstock
'Merensky 1' (Latas™)	Westfalia, South Africa	South Africa, USA, Australia, New Zealand, Israel, Spain, Chile, Brazil, Peru (pending)	Rootstock
'Merensky 2' (Dusa™)	Westfalia, South Africa	South Africa, USA, Australia, New Zealand, Israel, Mexico, Spain, Chile, Brazil, Peru	Rootstock
'Pvt'	Peet van Tonder, South Africa	South Africa, Australia, New Zealand	Rootstock
Thomas	University of California	USA	Rootstock
'3-29-5' (Gem)	University of California	USA, South Africa, Kenya.	Fruiting
#86 (Berwil, Bundaberg Gold)	University of California	Australia	Fruiting
'AO.06'	Westfalia, South Africa	South Africa, USA, Kenya	Fruiting
'Alpha Krome'	Krome family, Brooks, Neal Palmer	USA	Fruiting
'Carla'		USA	Fruiting
'Don Gillogly'	Don Gillogly	USA	Fruiting
'Fruta De Oro Seedless'	Juan Salas, Costa Rica	USA	Fruiting Seedless
'Harvest'	University of California	USA, South Africa, Kenya, Israel	Fruiting
'Lamb Hass'	University of California	USA, South Africa, Spain, Australia, Chile, Israel	Fruiting
'Llanos Hass'	Llanos family, Western Australia	Australia, South Africa, USA, New Zealand	Fruiting
Maluma Hass	A. Ernst	South Africa, Australia, New Zealand	Fruiting
'Mendez No. 1' (Carmen@Hass)	Carlos Mendez Vega	USA, South Africa, Kenya, Spain, Israel, Australia	Fruiting
'Sir-Prize'	University of California	USA, South Africa	Fruiting

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**Fig.1.** Schematic representation of the process followed for the selection, testing, protection and commercialisation of Merensky 2 (Dusa®) avocado rootstock internationally (Drawn up using Westfalia records 1980-2006).

**Figura 1.** Representación esquemática de los procesos seguidos para la selección, evaluación, protección y comercialización internacional del patrón de aguacate Merensky 2 (Dusa®) (Dibujado usando los registros de Westfalia entre los años 1980-2006).