

THE DEVELOPEMENT OF VINEYARD ZONATION AND DEMARCATION IN SOUTH AFRICA

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Résumé

L'histoire de viticulture de l'Afrique du Sud embrasse 340 ans, et a commencé, à la province du Cap, où les colonisateurs hollandais ont planté les premières vignes. L'arrivée des Huguenots français en 1688 a avancé, le développement. Les vins de Constantia deviennent renommés, et ainsi ils sont les premiers "vins d'origine" de l'Afrique du Sud. Pendant l'occupation britannique de la province du Cap en 1806, la viticulture a développé, davantage, dû à l'inaccessibilité, de l'Europe et ses vins pendant cette période. On a planté, la plupart des vignobles à la région côtière du sud-ouest, aux environs de la province du Cap, et aux vallées limitrophes. Ces régions sont toujours productrices principales de vin. Vers 1850, les exportations de vin étaient très limitées, dû à la détérioration de la qualité de vin. Ce fait a résulté du manque de contrôle d'origine et de qualité. L'industrie a reconnu ce problème, ce qui mène à la fondation d'un système de contrôle de Vin d'Origine en 1973. Des experts techniques font la démarcation des secteurs de vin, en employant quatre catégories. Ces sont: (1) Régions, (2) Districts, (3) Circonscriptions ('Wards'), et (4) Domaines. Faute d'assez de traditions, d'expérience et des données expérimentales (contrasté avec les pays européens de viticulture), la philosophie sud-africaine de démarcation embrasse l'identification des unités de terrain naturel, en employant des données techniques qui sont disponibles. Ensuite ces unités développent de façon indépendamment leur propres caractères de vin, plutôt que de demander preuve de caractère unique avant qu'on a fait la démarcation.

Summary

The 340 year old history of viticulture in South Africa started with the first planting of vines by the Commander of the first Dutch settlers at the Cape. Further expansion was encouraged by succeeding Governors and also stimulated by the arrival of the French Huguenots in 1688. Constantia wines became internationally famous and thus were the first 'wines of origin' from South Africa. After the British occupation of the Cape in 1806, viticulture was further stimulated due to the inaccessibility of Europe and its wines to Britain at that stage.

Vineyards were mainly established in the south-western coastal zone around the Cape and in adjacent inland river valleys where irrigation water was available. These areas, characterised by a Mediterranean climate, are still the main wine producing regions today. Towards 1850, wine exports reached an all time low because of the deterioration in wine quality, mainly as a

result of the absence of control over origin and quality. This problem was realised by the industry and resulted in a Wine of Origin Control system since 1973.

Demarcation of existing vineyards was, and still is, done by technical experts, using four categories, viz. (1) Regions, based on broad geographical features and administrative boundaries; (2) Districts, based on geographical and macro climatic features; (3) Wards, essentially based on uniform soil, climatic and ecological patterns; and (4) Estates, based on the concept of singular ownership of vineyards and wine being produced on the estate.

To demarcate Wards, land type maps are used. Land types are a concept unique to South Africa and is defined as a class of land over which the macro climate, the terrain form and soil pattern each displays a marked uniformity. Land types differ from each other in terms of macro climate, terrain form or soil pattern, or combinations of these natural factors.

Lacking sufficient tradition, experience and experimental information, compared to the old world wine countries, the philosophy behind demarcation in South Africa is to identify natural terrain units, using available technical information, and then allowing such units to develop and demonstrate particular wine styles and character, rather than demanding proof of uniqueness before demarcation is done.

VINEYARD DEVELOPMENT

South Africa is probably the only country where it is exactly known when viticulture started. Jan van Riebeeck, commander of the first Dutch settlers (1652) at the Cape of Good Hope (presently Cape Town), can be called the first wine farmer (Perold, 1936). He imported vines in 1655 and made the first wine in 1658 from grapes grown in gardens around the fort. More formal vineyards were established in areas in the vicinity of a suburb, today still called Wine Berg.

In 1685, Simon Van der Stel, the Governor of the Cape Colony, probably made the first terrain selection, choosing from all available land the cool and sheltered Constantia area in the Cape Peninsula for his vineyards. Here he made red wines of outstanding quality and established imported German cultivars in 1705 (Archer & Saayman, 1996). During the period 1780-1890, Constantia gained international status with the demand for its natural sweet wines, i.e. by King Louis Phillipe and Napoleon Bonaparte of France and Bismarck of Germany. However, the fame of Constantia and other reputable wines were progressively undermined by inferior quality wines being offered under their names on the export markets. Today Constantia and environments is a demarcated ward and its wines are presently again highly esteemed by wine connoisseurs.

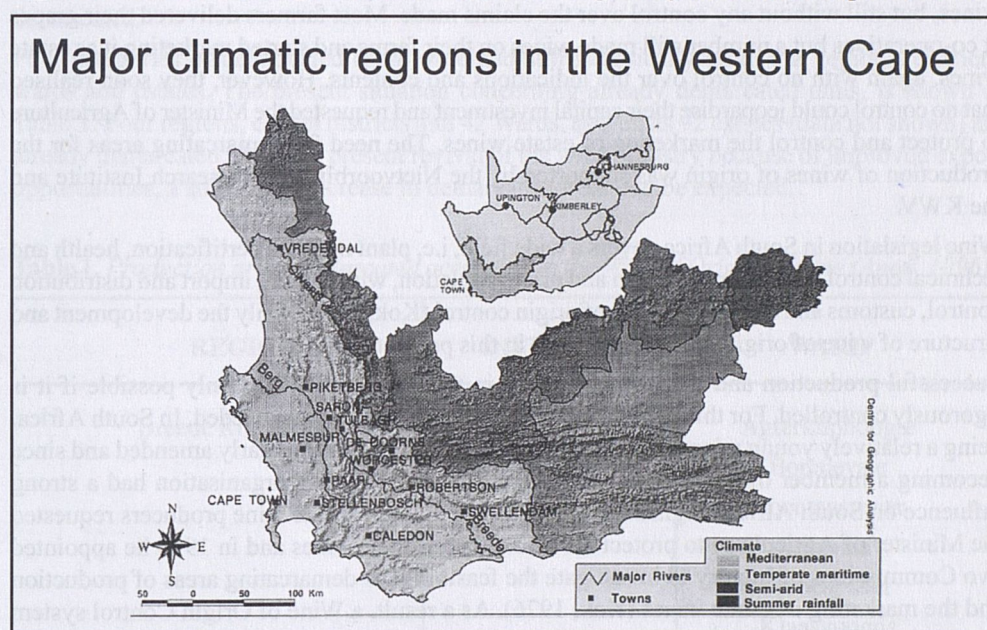
The Dutch settlers, turned farmers, were at first not enthusiastic about viticulture but the advent of the French Huguenots in 1688 markedly stimulated the young wine industry (Perold, 1936), especially in the regions around Stellenbosch, Franschhoek and Paarl (Fig. 1).

Willem Adriaan van der Stel, succeeding his farther as Governor, was a great believer in the wine industry, and developed Vergelegen near the present day Somerset West, where he planted 100.000 to 250.000 vines (Perold, 1936). Realising the quality of the grapes grown in the Cape, the Governor-General, Baron von Imhoff, recommended in 1743 that viticulturists be obtained from the Rhine and from France to instruct the settlers in wine making.

The 1793 statistics of Commissary De Mist showed the Cape to have 0.86 million vines and Stellenbosch (at that time including Caledon, Paarl, Malmesbury, Piketberg, Tulbach, Ceres and Worcester districts, Fig.1) 0.91 million vines, reflecting the zonation and size of wine growing regions for the whole colony at that time (Perold, 1936). He also recommended the importation of French and European vines, which was only fully realised when Perold imported

about 100 of the best grape varieties of Europe and Algeria on behalf of the Government (Perold, 1936). The British occupied the Cape in 1806 and since 1811, when Great Britain could not obtain European wine, officially encouraged viticulture at the Cape and introduced preference tariffs in 1813, causing a dramatic stimulation in the wine industry (Burger, 1977). In 1880, the first investigation into the presence of the feared phylloxera was done. At that stage there were over 120 million vines in the Western Province, comprising 44.000 to 45.000 acres (Perold, 1936), viz. about 18.000ha. Phylloxera broke out in 1886, but no time was lost in importing from France American vine material, enabling the Cape grape producers to overcome this crisis.

Fig. 1. *Traditional wine region centres and climatic regions of the Western Cape Province*



Presently South African viticulture comprises more than 103.000 ha (308.8 million vines), of which about 91% are planted to wine grapes, producing more than 1.000 million liters of wine (Archer & Saayman, 1996). The traditional viticultural region is the Western Cape Coastal Region (including Constantia, Durbanville, Darling, Stellenbosch, Somerset West, Paarl, Wellington and Tulbach), as well as parts of the Swartland such as Darling, Malmesbury, Porterville and Piketberg, characterised by a frost free Mediterranean climate (Fig. 1), with about 30% of the annual rain occurring during the growing period, mainly in spring and autumn. Because of the generally highly weathered, acid soils with a low organic material content and low cation exchange capacity, often gale force winds and limited water reserves, moderate vigour and production levels are experienced. Coupled to a relative cool climate the emphasis in these areas is on quality wine production.

Further inland, and separated from the coast by mountain ranges and having high aridity indexes, viticulture mainly developed along river valleys like the Breede River, Hex River (almost exclusively table grapes), Olifantsrivier and Orange River, where water for irrigation was available (Saayman, 1988). The latter region has a summer rainfall and specialises in early maturing table and raisin grapes, although bulk wines are also produced.

THE WINE OF ORIGIN CONCEPT

The original wines produced in South Africa were generally of fair quality, wines from Constantia being outstanding and which can be considered as the first 'wines of origin' from South Africa. However, lack of control over quality and origin of wines sold under the name of Constantia eventually caused a decline in demand for these wines. The wine industry as a whole also flourished and declined, especially because of unscrupulous exporting of inferior wines and the phylloxera disaster. An overproduction situation developed at the beginning of the 20th century but this time financial ruin was averted by the formation of the Co-operative Wine Growers Association (KWV), which insured stability but also restrained free economic enterprise (Kok, 1976).

Gradually merchants started indicating cultivars and vintage on the labels of better quality wines, but still without any control over the claims made. Most farmers delivered their grapes at co-operatives but a number still made wines on their farms and started marketing it as estate wines, again with no control over the indications and contents. However, they soon realised that no control could jeopardise their capital investment and requested the Minister of Agriculture to protect and control the marketing of estate wines. The need for demarcating areas for the production of wines of origin was supported by the Nietvoorbij Wine Research Institute and the KWV.

Wine legislation in South Africa covers a wide field, i.e. plant material certification, health and technical control on wine, production and price regulation, wine export, import and distribution control, customs and excise and wine of origin control (Kok, 1994). Only the development and structure of wine of origin will be dealt with in this presentation.

Successful production and marketing of wine in the modern world is only possible if it is rigorously controlled. For this, legislation and inspection services are needed. In South Africa, being a relatively young wine producing country, legislation was regularly amended and since becoming a member of the OIV in 1961, decisions taken by this organisation had a strong influence on South African legislation (Kok, 1994). In 1969 estate wine producers requested the Minister of Agriculture to protect the marketing of their wines and in 1970 he appointed two Commissions of Inquiry to investigate the feasibility of demarcating areas of production and the marketing of estate wines (Kok, 1976). As a result, a Wine of Origin Control system was in place in 1973, with the Act on Liquor Products (Act no. 60 of 1989) presently stipulating that any indication of origin, cultivar or vintage is prohibited unless the area, district or ward is demarcated and the wines have been produced in terms of the control system (Kok, 1994).

The origin concept received further support and acceptance because of research during the seventies. In field trials the marked effect of soil on wine character could be demonstrated (Saayman, 1977). This work also showed that wine character is not necessarily determined by an intrinsic soil property, but that it is largely influenced by the climate of the specific season. Therefore, the soil effect may vary from year to year. Presently the ARC's Nietvoorbij Centre for Vine and Wine is still actively engaged in research aimed at quantifying soil (WJ Conradie, 1998 - paper to be presented at the Territory & Wine Symposium, Siena, Italy) and climatic factors that have prominent effects on wine character.

DEMARCATATION

Demarcation was and still is done by technical experts, appointed by the Wine and Spirit Board, the controlling organisation. These experts are viticulturists, oenologists and soil scientists, drawn from research institutions, producer organisations and the wine industry. The Wine and Spirit Board used to be part of the subdirectorate Liquor Control of the Department of

Agriculture, who administered the Wine, Other Fermented Beverages and Spirit Act 25 of 1957. This Act became too cumbersome and was replaced by the Liquor Products Act of 1989 (Anon, 1997), which allowed the privatisation of the Wine of Origin Scheme in 1990. The demarcation process started in 1972 (Kok, 1976). Demarcation is not forced on producers but only investigated on application of interested producers or groups, and implemented if found viable. In a young wine country like South Africa, where tradition is not well developed and sufficient experimental information is lacking, it is only natural and logic that much emphasis is placed on soil and climatic aspects (Saayman, 1976). The basic principle is, therefore, to demarcate areas according to natural features, principally landscape and soil patterns, macro climatic and ecological features. This then allows producers in a demarcated area to develop their vitiviniculture within this framework, and consequently the area to distinguish itself as unique in terms of wine style or character, rather than having to prove this before being demarcated.

Four categories of demarcated areas were and still is basically used, viz. regions, districts, wards and estates. The present situation concerning already demarcated units, is shown in Table.1. Four regions, eleven districts and 42 Wards, as well as 92 estates (data not shown) are already demarcated. With the present revival of the wine industry because of improved export opportunities, a substantial increase in demarcated areas can be expected.

Table 1. *Production areas demarcated according to the Wine of Origin Scheme (Anon, 1996)**

REGION	DISTRICT	WARD
Breede River Valley	Robertson	Agterkliphoogte
		Bonnievale
		Boemansrivier
		Eilandia
		Hoopsrivier
		Klaasvoogds
		Le Chasseur
		McGregor
		Vinkrivier
	Worcester	Aan-de-Doorns
		Goudini
		Nuy
		Scherpenheuvel
	Swellendam	Slanghoek
		Buffeljags
Klein Karoo	Calitstdorp	Montagu
		Tradouw

REGION	DISTRICT	WARD
Coastal Region	Paarl Stellenbosch Swartland Tulbagh	Constantia Durbanville Franschhoek Wellington Jonkershoek Valley Papegaaiberg Simonsberg-Stellenbosch Bottelary Devon Valley Groenekloof Riebeekberg
Olifantsrivier		Koekenaap Lutzville Valley Spruitdrif Vredendal
	Overberg	Walker Bay Elgin
	Piquetberg Douglas	
		Andalusia Benede-Oranje Cederberg Ceres Herbertsdale Rietrivier OVS Ruiterbosch Swartberg
Boberg	(For the use of fortified wine from Paarl and Tulbagh)	

* Western Cape is an umbrella geographical unit which encompass all regions, districts and wards, except Andalusia, Douglas, Benede-Oranje and Jakobsdal-OVS, which are situated in the Northern Cape and the Orange Free State Provinces.

Although divisional districts (administrative boundaries) were used to demarcate the larger, more encompassing regions, their boundaries still conformed to an important degree to macro geographical features like mountain ranges and rivers and they represent broad climatic regions. For the second category, the smaller districts, the boundaries of divisional districts were again mostly used, but in such a way as to represent more defined macro climatic regions, sometimes necessitating the grouping of more than one district or only parts of districts.

The third category consists of still smaller units called wards, and can be considered the most refined. For their demarcation the following factors are considered:

1. All soil and climatic factors, or combinations thereof, that could have an effect on wine quality.
2. Existing cultural practices in any area that may effect the wine character or distinguish one area from another.
3. Existing experience and evidence, proving that an area can really produce an unique wine.
4. Geographical and other factors that contribute towards the development of a traditional wine area.
5. The traditional name of an area, properly describing the area and by which the area has become known with the passing of time.

The fourth category is estates. The basic requirements here is that the land must be owned by the same producer, that only grapes from the demarcated property may be marketed under the name of the estate, that officially approved wine making facilities exist on the estate and that the wine must be vinified on the estate. The demarcation of estates is consequently largely an administrative matter.

The demarcation of wards is essentially based on land types. The land type concept is unique to South Africa and was proposed by Macvicar et al. (1974). This culminated into a series of Memoirs on the Agricultural Natural Resources of South Africa and accompanying 1:250.000 land type maps, covering the whole of South Africa.

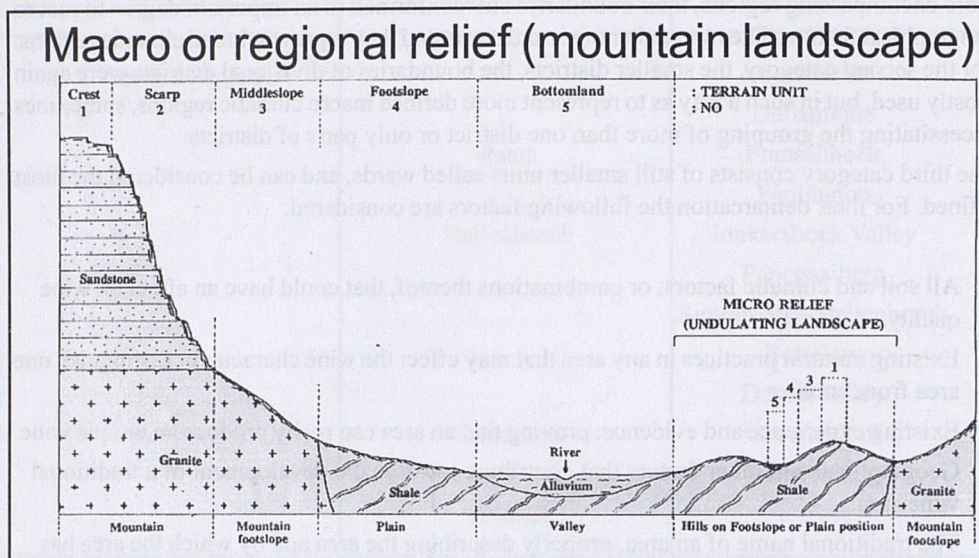
A land type is defined as a class of land over which the macro climate, the terrain form and the soil pattern each displays a marked degree of uniformity.

This uniformity is such that there would be little advantage in defining more uniform landscapes. One land type differs from another in terms of macro climate, terrain form and soil pattern, or one of these, or two of these (Macvicar et al., 1974). Using the method of Kruger (1973), 1:50.000 topo-cadastral maps and field surveys were used to map areas of uniform terrain on a 1:250.000 scale, called terrain morphological types.

In its turn, a terrain types consist of terrain morphological units, which can be crest, scarp, middleslope, footslope and bottomland (Fig..2). Soils of each terrain morphological type were investigated using the method compiled by Verster (1973), resulting in a 1:250.000 map of pedosystems (soils with similar distribution over a terrain morphological type, i.e. a markedly uniform terrain soil pattern and geology).

Macro climate was mapped according to the method proposed by Macvicar (1973), principally using existing meteorological data, terrain form soil pattern and vegetation as indicators of climatic changes.

Fig. 2. Typical geology and around Stellenbosch and Paarl, with indications of terrain units.



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