PROGRESS IN THE SUPPLY OF IMPROVED PLANT MATERIAL IN THE SOUTH AFRICAN WINE INDUSTRY

G J LE R KRIEL - MANAGER: PLANT IMPROVEMENT, KWV, REP OF SOUTH AFRICA

1. INTRODUCTION

Over years wine technology in the RSA developed to a high standard, with modern cellar equipment and facilities, but the vineyards lagged behind. This was to a great extend due to the use of bad quality plant material. [slides 1 + 2].

Although mass selection was propagated amongst nurserymen and producers, there were no official regulations for improved plant material. According to a survey made by indexing in 1970, about 99% of the South African vineyards were infected with graft transmissible viruses. This compared very bad with the reported 1 - 2% infection in German clonal selected material (Becker, H., 1974) and 2,7% fanleaf and 16,4% leafroll infection in France (Huglin, P., 1972).

Plant improvement activities started in 1963 in co-operation between KWV, the Department of Agriculture [Oenological and Viticultural Research Institute (OVRI), Department of Plant- and Seed Controll (PSC) and Research Institute for Plant Protection (RIPP)]. The main purpose was to supply the industry with the best available viticulturally selected material which tested free from known harmful virus diseases.

2. CERTIFICATION SCHEMES

There are two official voluntary Plant certification schemes applied by the Department of Agriculture in the South African wine industry.

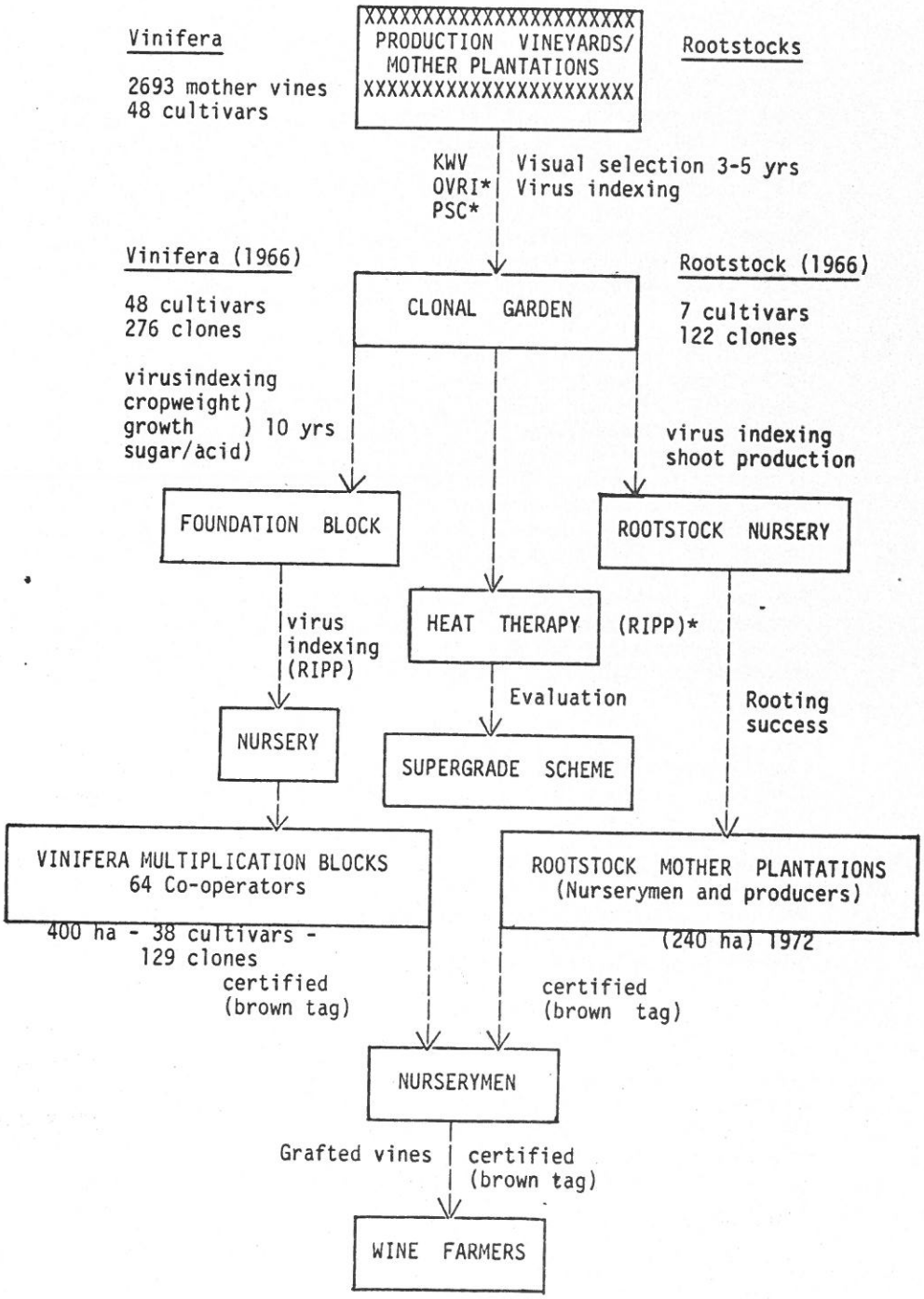
2.1 "SCHEME FOR S A SELECTED PLANTS"

This is viticulturally selected material (mass selection and/or clonal selection) which reveal no visual virus symptoms. Any nurseryman can subscribe material to be certified in this scheme.

The flow diagram of KWV material in this scheme is indicated in Figure 1.

FIGURE 1

FLOW DIAGRAM OF KWV MATERIAL IN "SCHEME FOR S A SELECTED PLANTS"



*OVRI = Oenological and Viticultural Research Institute
PSC = Department of Plant- and Seed Control
RIPP = Research Institute for Plant Protection

2.1.1 Rootstocks

Mother vines were visually selected by officials of KWV and the Department of Agriculture in mother plantations and virusindexed. About 122 candidate clones of 7 cultivars were planted in a clonal garden where further indexing was done and shoot production measured. Cuttings were rooted in a rootstock nursery and the rooting success measured. Those clones that performed best were issued to nurserymen, who established their own mother plantations. About 240 ha were planted. Material from these mother plantations qualified to be certified in the "Selected scheme". The best perfoming clones were simultaneously subjected to heat therapy for virus elimination by RIPP. After evaluation these clones were released in the "supergrade scheme".

2.1.2 Scions

In 1963 there were 3693 marked vines of 48 cultivars, selected by government officials over a period of 3 years in production vineyards. These vines were viticulturally inspected over a further 3 years period by viticulturists of KWV and OVRI and eliminated to the best 276 mother vines. Ten vines per candidate clone, grafted on two rootstock cultivars were planted from 1967 to 1970 in clonal gardens in three localities. Virusindexing was done on these clones and production records taken over 10 years.

The best performing clones were multiplied on virus indexed rootstocks in a foundation block, bench grafted and established in multiplication blocks on the premises of contracted co-operators. Certified scion material is sold from these blocks to nurserymen.

The best performing clones from the clonal garden were simultaneously subjected to heat therapy for virus elimination by RIPP to be released in the "supergrade scheme" after evaluation.

2.2 "SCHEME FOR S A SUPERGRADE PLANTS"

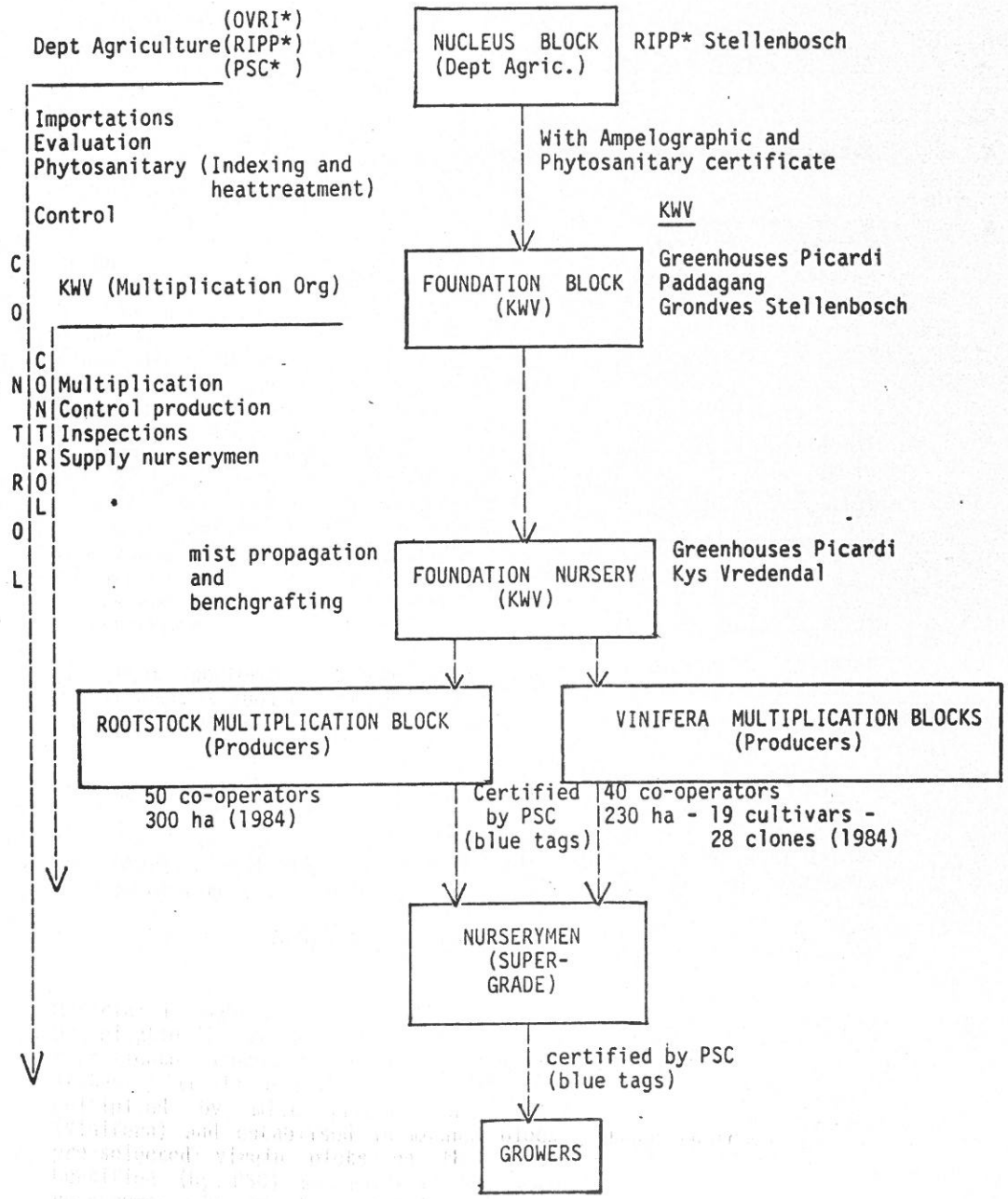
This is viticulturally selected clonal material which test free from known harmful viruses, mainly after heat therapy. The flow diagram of material in this scheme is indicated in Figure 2.

(Fig. 2 + Slides)

Material is made available to KWV (the official "Multiplication organisation") by the Department of Agriculture, with a certificate, guaranteeing the Ampelographic and Phytosanitory status. It is established by KWV in "Foundation blocks", multiplied by mist propagation (rootstock) and grafting (Vinifera) and estabilised in mother blocks, under contract on pre-selected virgin plots on the farms of co-operators. Certified (by PSC) material is made available (by KWV) to nurserymen, who grow the grafted vines in approved nurseries.

FIGURE 2

FLOW DIAGRAM OF MATERIAL IN "SCHEME FOR S A SUPERGRADE PLANTS (1974)



*RIPP = Research Institute for Plant Protection
*OVRI = Oenological and Viticultural Research Institute
*PSC = Department of Plant and Seed Control

3. DEMAND FOR PLANT MATERIAL

With 100 000 ha of winegrapes, the RSA needs at this stage about 16 million grafted vines, 33 million rootstock cuttings and 33 million scions each year.

4. AVAILABLE CERTIFIED PLANT MATERIAL

4.1 ROOTSTOCK MATERIAL

Material established by KWV in multiplication blocks in the "supergrade scheme" as indicated in Table 1.

(Table 1)

There are 676 886 vines (+ 300 ha) of 8 cultivars and 19 clones established in 50 blocks. The production potential is 21,3 million cuttings in 1985 (= 59% of demand) and the full demand of 33 million in 1989. At this stage the rest of the demand is supplied by nurserymen in the "selected scheme" or uncertified.

4.2 SCION MATERIAL

Material ("supergrade" + "selected") established in KWV multiplication blocks is indicated in Table 2.

(Table 2)

There are 156 clones of 42 cultivars established in 64 "selected" blocks with 983 116 vines (400 ha) and 40 "supergrade" blocks with 586 728 vines (230 ha). This 630 ha of multiplication blocks have a total production potential of 87,8 million scions when in full production in 1987. In 1985 KWV will offer 10 million "supergrade" and 40 million selected scions.

4.3 GRAFTED VINES

In 1984 about 18% of the grafted vines sold were certified (13% "selected" + 5% "super") and 82% uncertified. In 1985 most of the nurserymen participate in the voluntary certification schemes and about 40% will be certified.

TABLE 1

ROOTSTOCK CULTIVARS IN SUPERGRADE MULTIPLICATION BLOCKS AUGUST 1984

Cultivar	Number of clones	Number of vines	Production 1985 (Estimated cuttings)	Potential Production 1989 (Estimated cuttings)
99 Richter	4	265 777	8 796 000	12 676 000
101-14 Mgt	4	140 175	5 325 000	7 089 500
110 Richter	1	120 785	2 397 300	5 535 700
Ramsey	2	75 884	3 272 300	4 510 500
140 Ruggeri	2	43 637	453 500	1 978 500
Jacquez	3	13 909	563 500	584 500
1103 Paulsen	1	12 315	345 000	509 700
143B	2	4 404	149 000	216 000
TOTAL (8)	19	676 886	21 301 660	33 100 400
		± 300 ha	(59%)	(100%)

TABLE 2

VINIFERA CULTIVARS IN KWV MULTIPLICATION BLOCKS

SEPTEMBER 1984

Cultivars	Clones	Number of vines			1987 Potential production. (graftable buds x 10^3)
		Selected	Super	Total	
Chenin blanc	13	186 135	215 989	402 124	23 553
Colombar	5	131 202	146 756	227 958	18 270
Cape Riesling	6	87 501	91 926	179 427	10 967
Sauvignon blanc	11	83 898	-	83 898	5 592
Harslevelü	6	73 491	-	73 491	5 878
Muscat d'alexandrie	10	34 746	27 879	62 625	2 275
Fernao Pires	6	54 829	-	54 829	1 800
Cabernet sauvignon	5	26 076	18 260	44 336	1 773
Weisser Riesling	3	41 186	-	41 186	1 718
Pinotage	2	33 753	2 995	36 748	1 838
Bukettraube	2	28 947	4 900	33 847	2 608
Chenel	5	29 497	-	29 497	960
Clairette blanche	3	2 007	23 082	25 089	846
Furmint	3	23 955	-	23 955	1 647
Kerner	1	19 154	-	19 154	900
Pinot noir	5	14 237	-	14 237	600
Merlot	7	10 504	3 232	13 736	548
Ruby Cabernet	3	10 734	-	10 734	330
Therona	-	10 291	-	10 291	457
Cinsaut noir	5	9 065	1 151	10 216	409
Ugni blanc	2	9 699	-	9 699	80
Emerald Riesling	1		8 930	8 930	357
Cabernet franc	2	25	8 300	8 325	338
Palomino	2	4 072	4 150	8 222	450
Chardonnay	11	7 954	-	7 954	318
Muscat rouge	5	7 933	-	7 933	320
Pinot gris	4	7 859	-	7 859	314
Shiraz	2	-	6 945	6 945	278
Tinta Barocca	3	125	6 800	6 925	332
Muscat Ottonel	1	6 635	-	6 635	300
Semillon	2	6 065	-	7 065	296
Muscat blanc	3	5 569	-	5 569	220
Zinfandel	1	-	5 316	5 316	212
Sultanina	2	-	5 243	5 243	300
Morio Muscat	2	3 952	-	3 952	260
Grenache blanc	2	1 585	2 160	3 745	133
Gewürztraminer	5	3 600	-	3 600	144
Schönburger	2	2 800	-	2 800	112
Gamay noir	1	-	2 714	2 714	120
Pinot blanc	1	1 761	-	1 761	70
Sylvaner	-	1 184	-	1 184	50
Cinsaut blanc	1	1 090	-	1 090	40
TOTAL (42)	156	983 116	586 728	1 569 844	87 879
		(400 ha)	(230 ha)	(630 ha)	

5. OBJECTIVES FOR THE FUTURE

5.1 GENITICAL CLONAL SELECTION

Hopefully within the next couple of years we shall have a wide range of viticulturally selected clones (locally selected + imported) within the most important cultivars that test free from known harmful virus diseases. Only then it will be possible to apply meaningful genetical clonal evaluation to identify superior clones for specific purposes (wine quality, etc.), without the interference of virus combinations.

5.2 ENVISAGED "SCHEME FOR S A CERTIFIED PLANTS"

Due to practical problems encountered with existing virus elimination and indexing techniques - re-appearance of certain virus symptoms in some heat treated material - the replacement of the existing "Scheme for S A selected plants" and "Scheme for S A superplants" with a newly adapted "Scheme for S A certified plants" is envisaged. This scheme will make provision for two categories of material.

5.2.1 "Choice grade" plants

This is viticulturally selected clonal material which test free from group A-viruses (Fanleaf-group); and

5.2.2 "Super grade" plants

This is viticulturally selected clonal material which test free from group A and group B-viruses (Leafroll, Stemgrooving, Corky bark and Fleck).

In this way the industry will always be supplied with the best available material of a specific cultivar/clone.

5.3 ENVISAGED VINE IMPROVEMENT BOARD (VIB)

The creation of a VIB is about to realise in the South African Wine industry.

5.3.1 Membership

The VIB will consist of the following members:

The Department of Agriculture (2);
KWV (3) (Industry members)
Cape Wine and Spirit Institute (CWSI) (3) (Industry members)
Nurserymen (1) Co-opted

5.3.2 Objectives

The objectives of the VIB will be:

5.3.2.1 To decide on priorities for cultivars to be improved and multiplied.

5.3.2.2 To co-ordinate the development of plant material by selection, heat treatment or importation and the identification of the best sources of plant material.

5.3.2.3 To co-ordinate the multiplication and supply of the best available material.

LITERATURE CITED

1. Becker, H., 1974. Etat actuel des travaux sur la sélection clonale génétigue et sanitaire. Bull. OIV 521-522; 547-567.

2. Huglin, P., 1972. Die Rebenzüchtung in Frankreich Weinberg und Keller 19, 383-391.

Fortschritt in der Versorgung von Klonenmaterial in Südafrika

von G. Kriel, Südafrika

1. Einleitung

Jahrelang hat sich die südafrikanische Weinwirtschaft und moderne Kellerwirtschaft zu hohem Standard entwickelt, aber die Weinberge hinkten unter dieser Entwicklung nach. Dies hing mit dem Einsatz von schlechtem Rebenpflanzgut zusammen (DIA 1 und 2). Obwohl Massenauslese propagiert wurde, gab es keine offiziellen Regelungen für Zuchtmaterial. 1970 wurde ein Bericht erstellt, der aufzeigte, daß 99 % der südafrikanischen Weinberge mit Viruskrankheiten befallen waren. In Deutschland waren (nach Becker, Geisenheim) nur 1 - 2 % infiziert und in Frankreich 2,7 bis zu 16 % (nach Hugin) mit Leafroll (Blattrollkrankheit).
Aktivitäten, diesen Zustand in Südafrika zu ändern, begannen 1963 in Kooperation mit der KWV, dem Weinforschungsinstitut und dem Pflanzenschutzdienst. Das Hauptziel war die Weinwirtschaft mit gesundem, virusfreien Rebenpflanzgut zu versorgen.

2. Zertifikations-Schema

Es gibt zwei offizielle, aber freiwillige Schemata, die durch das landwirtschaftliche Ministerium für die südafrikanische Weinwirtschaft angewendet werden.

2.1. Schema für südafrikanische selektionierte Pflanzen

Das visuell selektionierte Material (Massenauslese oder Klonenselektion), welches keine Virussymptome zeigt. Jeder Rebschulmann kann dafür sorgen, daß solches Material zertifiziert wird.
Das Diagramm der KMV zeigt Figur 1.

2.1.1. Unterlagen

Mutterstöcke wurden visuell selektioniert durch KWV und Ministerium und virusgetestet. 122 Klone von 7 Sorten wurden im Klonen-Garten gepflanzt und durch Indexing getestet. Stecklinge wurden bewurzelt und der Erfolg bewertet. Die besten Klone wurden an Rebschulen zur