PART 1 - BESTS' VINEYARDS

(A) Area and Location

The total area surveyed is about 45 hectares situated near Great Western, about 219 kilometres north-west of Melbourne. The area lies in the Parish of Concongella, Shire of Stawell, County of Borung. It encompasses Allotment 46 (Section 5) and parts of six other adjacent allotments in Section 5 and 6 in that Parish.

(B) Climate

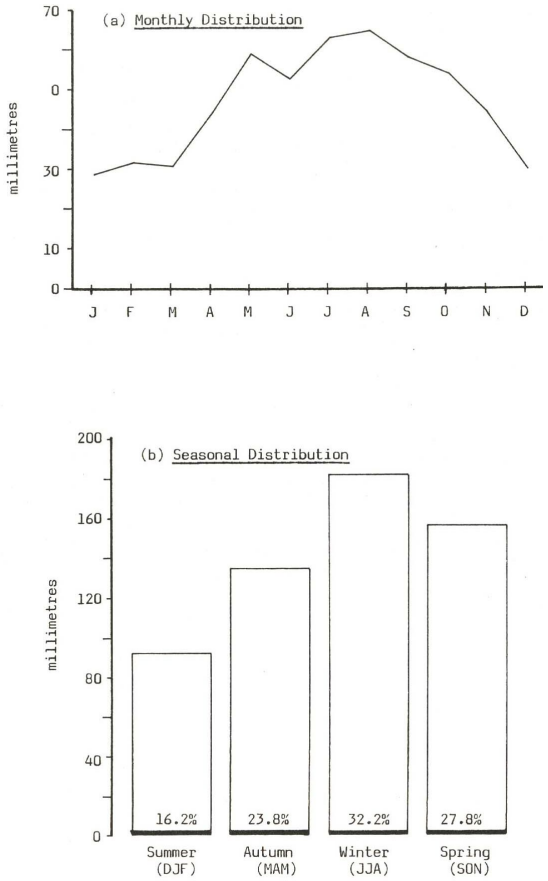
Rainfall was recorded at Bests' Vineyards for the past 28 years. The data have been analysed and the long-term averages are listed below (Table B-1). The graphs in Figures B-1(a) and B-1(b) illustrate the monthly and seasonal distributions of the vineyards' average annual rainfall.

Table B-1 - Average* Rainfall at Bests' Vineyards, Great Western

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
mm	29	32	31	44	59	53	63	65	58	54	44	30	562

* 28 years

Figure B-1: Distribution of the Annual Rainfall at Bests' Vineyards



(C) Soils

(i) Soil Types and Miscellaneous Units

The main soils of Bests' vineyards belong to the three soil series recognised in the survey. Listed below (Table B-2) are the soils mapped in these vineyards.

Table B-2 - The Main Soils of Bests' Vineyards

Soils	Mapping Symbols
Concongella Series	
Concongella loam	Cl
" " (deep surface)	Cl (d)
Great Western Series	
Great Western loam	GW l
Stawell Series	
Stawell sandy loam (deep surface)	S sl (d)
" " " (deep surface & stony profile)	S sl (d & s)
Stawell loam	Sl
Stawell sandy clay loam	S scl
" " " " (deep surface)	S scl (d)
" " " " (deep surface & stony profile)	S scl (d & s)
Stawell clay loam (shallow surface)	S cl (sh)
Minor Soil Types	
Minor soil type 1	M.T.1

Although most of these soils were mapped separately, four complex units were used where more than one soil recurred over short distances. The four units and their dominant soils are as follows:-

- Complex I : Sl, S scl and S scl (d).
- Complex II : Cl (d) and M.T.1.
- Complex III : Varied soils in gullies and depressions; including Scl (sh).
- Complex IV : Varied soils of the creek bank.

The areal distribution of these soils is shown on the soil map (Figure B-3) and the approximate area of each mapping unit (% of the total area surveyed) is listed in Table B-3.

Table B-3 - Distribution of the Mapping Units on Bests' Vineyards

Mapping Units	Area (%) (approx.)
Concongella Series	13
Cl	11
Cl (d)	2
Great Western Series	16
GW l	16
Stawell Series	30
S sl (d)	17
S sl (d & s)	13
Minor Soil Types	4
M.T.1	4
Soil Complexes	37

Mapping Units	Area (%) (approx.)
Complex I	20
Complex II	11
Complex III	4
Complex IV	2
Total .	100 100

(ii) Representative Soil Profiles

Average soil profiles were selected to represent the mapping units. These profiles have been numbered and located on the accompanying soil map. The morphological features of these profiles are given below and their analytical data are listed in Appendix B. It should be appreciated, however, that within each mapping unit, soil profiles at individual situations usually will differ in some features from the described and analysed profiles.

CONCONGELLA LOAM
(one representative profile)

Profile B-1

Profile Reference: WM 15/42
Topography: Upper-gentle slope in undulating plain
Soil Classification: Dr 2.32/L (15 cm)

Soil Description:

Surface Soil

0 – 15 cm; strong brown (7.5YR5/6) loam; apedal, hard setting; hard (dry), friable (moist), non-plastic and slightly sticky (wet); nests of bleached soil materials are sporadically present at the sharp boundary between this horizon and the clayey subsoil below:

Subsoil

15 – 45 cm; red (2.5YR4/6m) heavy clay; strong fine and medium angular blocky structure; smooth-ped fabric; hard (dry), friable (moist), plastic and sticky (wet); clear boundary to:

45 – 70 cm; as above but; mottled yellowish red (5YR5/6m) and light brown (7.5YR6/4m); gradual boundary to:

70 – 90 cm; as above but; mottled strong brown (7.5YR5/6m) and light yellowish brown (10YR6/4m); gradual boundary to:

90 – 100 cm; as above but; pale brown (10YR6/3m) replacing the light yellowish brown; some gleying.

CONCONGELLA LOAM (Deep Surface)
(two representative profiles)

(A) Profile B-2

Profile Reference: WM 15/45
Topography: Mid-gentle slope in undulating plain
Soil Classification: Dr 2.22/L "fs" (35 cm)

Soil Description:

Surface Soil

0 – 15 cm; brown (7.5YR5/4m) loam "fine sandy"; apedal; hard setting; hard (dry), friable (moist), non-plastic and slightly sticky (wet); sharp boundary to:

15 – 35 cm; as above but; light reddish brown (5YR6/4m), 7/6d).

Subsoil

35 – 65 cm; yellowish red (5YR4/6m) heavy clay, strong fine and medium angular blocky structure; smooth-ped fabric; hard (dry), friable (moist), plastic and sticky (wet); gradual boundary to:

65 – 100 cm; as above but; (5YR5/6m) fine sandy clay.

(B) Profile B-3

Profile Reference: WM 17/1
Topography: Lower-gentle slope in a gently undulating plain.
Soil Classification: Dr 2.33/L (40 cm)

Soil Description:

Surface Soil

0 – 40 cm; brown (7.5YR5/4m) loam; apedal, hard setting; very hard (dry), friable (moist), non-plastic and non-sticky (wet); nests of bleached soil materials are sporadically present at the sharp boundary between this horizon and the clayey subsoil below:

Subsoil

40 – 70 cm; red (2.5YR4/6m) with some strong brown, heavy clay; moderate fine and medium angular blocky structure; smooth-ped fabric; very hard (dry), moderately friable (moist), plastic and sticky (wet); gradual boundary to:

70 – 100 cm; as above but; mottled yellowish brown (10YR5/6m) and yellowish red (5YR5/6m) medium clay (fine sandy).

GREAT WESTERN LOAM
(two representative profiles)

(A) Profile B-4

Profile Reference: WM 15/46
Topography: Mid-gentle slope (almost level area) in undulating plain.
Soil Classification: Dr 3.42/L "fs" (30 cm)

Soil Description:

Surface Soil

0 – 20 cm; yellowish brown (10YR5/4m) loam "fine sandy"; apedal, hard setting (dry); friable (moist), non-plastic and slightly sticky (wet); sharp boundary to:

20 – 30 cm; as above but; light brown (7.5YR6/4m) conspicuously bleached pink (7.5YR7/4d); sharp boundary to:

Subsoil

30 – 60 cm; mottled yellowish red (5YR4/6m) and yellowish brown (10YR5/4m) heavy clay; strong fine and medium angular blocky structure; smooth-ped fabric; hard (dry), friable (moist), plastic and sticky (wet); clear boundary to:

60 – 80 cm; as above but; mottled yellowish brown (10YR5/4m) and red (2.5YR4/8m); gradual boundary to:

80 – 100 cm; as above but; strong brown (7.5YR5/6m) replacing the red.

(B) Profile B-5

Profile Reference: WM 15/44
Topography: Mid-gentle slope in undulating plain.
Soil Classification: Dr 3.42/L "fs" (35 cm).

Soil Description:

Surface Soil

0 – 20 cm; yellowish brown (10YR5/4m) loam, "fine sandy"; apedal, hard setting; hard (dry), friable (moist), non-plastic and non-sticky (wet); sharp boundary to:

20 – 35 cm; as above but; pink (7.5YR7/4m) conspicuously bleached pinkish white (7.5YR8/2d); sharp boundary to:

Subsoil

35 – 65 cm; mottled red (2.5YR4/6m) and brownish yellow (10YR6/6m) heavy clay; strong fine and medium angular blocky structure; smooth-ped fabric; hard (dry), friable (moist), plastic and sticky (wet); gradual boundary to:

65 – 80 cm; as above but; yellowish brown (10YR5/4 and 5/6m) replacing the brownish yellow; gradual boundary to:

80 – 100 cm; as above but; mottled yellowish brown (10YR5/6m), light yellowish brown (2.5Y6/4m) and red (2.5YR4/6m)

STAWELL SANDY LOAM (Deep Surface)
(three representative profiles)

(A) Profile B-6

Profile Reference: WM 15/34
Topography: Mid-moderate slope in undulating plain
Soil Classification: Dy 3.41/SL (60 cm)

Soil Description:

Surface Soil

0 – 10 cm; brown (10YR4/3m) sandy loam; apedal, hard setting; hard (dry), friable (moist), non-plastic and non-sticky (wet); slight amounts of quartz and ferruginous concretions; sharp boundary to:

10 – 30 cm; as above but; light yellowish brown (10YR6/4m) conspicuously bleached white (10YR8/2d) loamy sand; clear boundary to:

30 – 60 cm; as above but; the amounts of ferruginous concretions increase to moderate; sharp boundary to:

Subsoil

60 – 90 cm; mottled yellowish brown (10YR5/6m), light yellowish brown (10YR6/4m) and red (2.5YR4/6m) heavy clay; strong fine and medium angular blocky structure; smooth-ped fabric; hard (dry), friable (moist), plastic and sticky (wet); trace amounts of quartz and ferruginous concretions; gradual boundary to:

90 – 120 cm; as above but; mottled red (2.5YR4/6m), yellowish brown (10YR5/6m) and pale brown (10YR6/3m); the amounts of stones increase to slight.

(B) Profile B-7

Profile Reference: WM 15/39
Topography: Lower-gentle slope in undulating plain.
Soil Classification: Dy 3.42/FSL (50 cm)

Soil Description:

Surface Soil

0 – 15 cm; brown (10YR4/3m) fine sandy loam; apedal, hard setting; hard (dry), friable (moist), non-plastic and non-sticky (wet); sharp boundary to:

15 – 50 cm; as above but; reddish yellow (7.5YR6/6m) conspicuously bleached pink (7.5YR7/4d); sharp boundary to:

Subsoil

50 – 65 cm; mottled yellowish red (5YR5/6m) and yellowish brown (10YR5/6m) medium clay "fine sandy"; strong fine and medium angular blocky structure; smooth-ped fabric; hard (dry), friable (moist), plastic and sticky (wet); gradual boundary to:

65 – 90 cm; as above but; fine sandy clay loam "heavy"; moderate pedality; slightly plastic and slightly sticky (wet); clear boundary to:

90 – 105 cm; as above but; strong brown (7.5YR5/6m) with some yellowish brown; clear boundary to:

105 – 120 cm; as above but; fine sandy clay loam with sand veins and some weathered sandstone fragments; water seepage.

(C) Profile B-8

Profile Reference: WM 15/25
Topography: Lower-moderate slope in undulating plain
Soil Classification: Dy 3.41/SL (45 cm)

Soil Description:

Surface Soil

0 – 10 cm; brown (10YR4/3m) sandy loam "gritty"; apedal, hard setting; hard (dry), friable (moist), non-plastic and non-sticky (wet); light amount of fine quartz; sharp boundary to:

10 – 45 cm; as above but; yellowish brown (10YR6/4m) conspicuously bleached very pale brown (10YR7/4d) loamy sand "gritty"; sharp boundary to:

Subsoil

45 – 85 cm; mottled strong brown (7.5YR5/8m) and red (2.5YR4/8m) heavy clay; strong fine and medium angular blocky structure; smooth-ped fabric; hard (dry), friable (moist), plastic and sticky (wet); trace amount of fine quartz; clear boundary to:

85 – 100 cm; as above but; mottled strong brown (7.5YR5/8m), red (2.5YR4/8m) and white (10YR8/1m).

STAWELL SANDY LOAM (Deep Surface & Stony Profile)
(two representative profiles)

(A) Profile B-9

Profile Reference: WM 15/23
Topography: Upper moderate slope in a slightly hilly area.
Soil Classification: Dy 3.42/SL (55 cm)

Soil Description:

Surface Soil

0 – 10 cm; brown (7.5YR4/4m) sandy loam; apedal, hard setting; hard (dry), friable (moist), non-plastic and non-sticky (wet); moderate amounts of quartz and ferruginous concretions; sharp boundary to:

10 – 55 cm; as above but; strong brown (7.5YR5/6m) conspicuously bleached pink (7.5YR7/4d); heavy amounts of quartz and ferruginous concretions; sharp boundary to:

Subsoil

55 – 75 cm; mottled yellowish red (5YR5/8m) and red (2.5YR4/6m) heavy clay; moderate fine and medium angular blocky structure; smooth-ped fabric; hard (dry), friable (moist), plastic and sticky (wet); light amounts of quartz and ferruginous concretions; gradual boundary to:

75 – 90 cm; as above but; mottled yellowish brown (10YR5/6m) and red (2.5YR4/6m) heavy clay "gritty"; light to moderate amounts of quartz and ferruginous concretions; bedrock at 90 cm.

(B) Profile B-10

Profile Reference: WM 15/31
Topography: Mid-gentle slope in undulating plain.
Soil Classification: Dy 3.42/SL (50 cm)

Soil Description:

Surface Soil

0 – 10 cm; brown (10YR4/3m) sandy loam "gritty"; apedal, hard setting; hard (dry), friable (moist), non-plastic and non-sticky (wet); light amounts of quartz and ferruginous concretions; sharp boundary to:

10 – 50 cm; as above but; reddish yellow (7.5YR6/6m) conspicuously bleached pink (7.5YR8/4d) loamy sand "gritty"; moderate amounts of quartz and ferruginous concretions; sharp boundary to:

Subsoil

50 – 65 cm; mottled strong brown (7.5YR5/8m) and red (2.5YR4/6) medium clay "gritty"; moderate fine and medium angular blocky structure; smooth-ped fabric; hard (dry), friable (moist), plastic and sticky (wet); slight amounts of quartz and ferruginous concretions; bedrock at 60 cm

STAWELL LOAM
(two representative profiles)

(A) Profile B-11

Profile Reference: WM 15/35
Topography: Mid-gentle slope in a gently undulating plain.
Soil Classification: Dy 3.33/L "fs" (20 cm).

Soil Description:

Surface Soil

0 – 15 cm; brown (10YR4/3m) loam "fine" sandy; apedal, hard setting; very hard (dry), friable (moist), non-plastic and slightly sticky (wet); clear boundary to:

15 – 20 cm; as above but; pink (7.5YR5/4m) sporadically bleached light grey (10YR7/2d); sharp boundary to:

Subsoil

20 – 35 cm; mottled yellowish brown (10YR5/4m) and yellowish red (5YR5/8m) heavy clay; strong fine and medium angular blocky structure; smooth-ped fabric; very hard (dry); friable (moist), very plastic and very sticky (wet); clear boundary to:

35 – 65 cm; as above but; whole coloured yellowish brown (10YR5/4m); arbitrary boundary to:

65 – 100 cm; as above.

(B) Profile B-12

Profile Reference: WM 15/49
Topography: Shallow-gully floor in a gently undulating plain.
Soil Classification: Dy 3.33/L (20 cm)

Soil Description:

Surface Soil

0 – 20 cm; yellowish brown (10YR5/4m) with some light yellowish brown (10YR6/4m) sporadically bleached very pale brown (10YR7/3d) loam; rusty root channels; apedal, hard setting; hard (dry), friable (moist), non-plastic and slightly sticky (wet); sharp boundary to:

Subsoil

20 – 50 cm; mottled yellowish brown (10YR5/6m) and red (2.5YR5/6m) with thick (up to 2 mm) ped-coatings 'cutan' dark greyish brown (2.5YR4/2m) heavy clay; strong medium and coarse angular blocky structure; smooth-ped fabric; very hard (dry), friable (moist), plastic and sticky (wet); sharp boundary to:

50 – 80 cm; as above but; whole coloured yellowish brown (10YR5/6m); trace amounts of small ferruginous concretions and flecks of black soft inclusions; sharp boundary to:

80 – 100 cm; as above but; mottled yellowish brown (10YR5/6m and 5/4m) and pale brown (10YR6/3m) medium clay.

STAWELL SANDY CLAY LOAM
(one representative profile)

Profile B-13

Profile Reference: WM 15/47
Topography: Mid-very gentle slope (almost level) in a gently undulating plain.
Soil Classification: Dr 3.42/FSCL (23 cm).

Soil Description:

Surface Soil

0 – 20 cm; brown (10YR5/3m) fine sandy clay loam; apedal, hard setting; hard (dry), friable (moist), slightly plastic and slightly sticky (wet); sharp boundary to:

20 – 23 cm; as above but; pale brown (10YR6/3m) conspicuously bleached white (10YR8/2d); sharp boundary to:

Subsoil

23 – 53 cm; mottled yellowish red (5YR5/6m), yellowish brown (10YR5/4m) and pale brown (10YR6/3m) heavy clay; strong fine and medium angular blocky structure; smooth-ped fabric; hard (dry), friable (moist), plastic and sticky (wet); gradual boundary to:

53 – 80 cm; as above but; mottled red (2.5YR4/6m), pale brown (10YR6/3m) and yellowish brown (10YR5/4m); clear boundary to:

80 – 100 cm; as above but; mottled yellowish red (5YR5/6m), light brownish grey (10YR6/2m) and yellowish brown (10YR5/4m).

STAWELL SANDY CLAY LOAM (Deep Surface)
(one representative profile)

Profile B-14

Profile Reference: WM 15/41
Topography: Lower-gentle slope in a gently undulating plain.
Soil Classification: Dr 3.43/FSCL (30 cm).

Soil Description:

Surface Soil

0 – 15 cm; brown (10YR4/3m) fine sandy clay loam; apedal, hard setting; very hard (dry), moderately friable (moist), non-plastic and non-sticky (wet); trace amounts of quartz and ferruginous concretions; sharp boundary to:

15 – 30 cm; as above but; very pale brown (10YR7/3m) conspicuously bleached white (10YR8/2d); no stones, sharp boundary to:

Subsoil

30 – 60 cm; mottled strong brown (7.5YR5/6m) and brown (10YR5/3m) heavy clay; strong medium and coarse angular blocky structure; smooth-ped fabric; extremely hard (dry), non-friable (moist), very plastic and very sticky (wet); gradual boundary to:

60 – 90 cm; as above but; mottled pale brown (10YR6/3m) and strong brown (7.5YR5/6m); clear boundary to:

90 – 110 cm; mottled light yellowish brown (10YR6/4m) and strong brown (7.5YR5/8m) coarse sandy clay gradually becoming clayey sand at about 100 cm; weak structure to almost massive; sandy fabric; very hard (dry), slightly friable (moist), plastic and very sticky (wet).

STAWELL SANDY CLAY LOAM (Deep Surface & Stony Profile)
(one representative profile)

Profile B-15

Profile Reference: WM 15/33
Topography: Gully-floor in undulating plain
Soil Classification: Dy 3.41/SCL (50 cm).

Soil Description:

Surface Soil

0 – 10 cm; brown (10YR4/3m) sandy clay loam; apedal, very hard (dry), slightly friable (moist), non-plastic and slightly sticky (wet); slight amounts of fine and medium quartz; sharp boundary to:

10 – 50 cm; very pale brown (10YR7/3m) conspicuously bleached white (10YR8/2d) sandy loam; massive; very hard (dry), friable (moist), non-plastic and non-sticky (wet); light to moderate amounts of fine and medium quartz; water seepage at about 45-50 cm; sharp boundary to:

Subsoil

50 – 90 cm; mottled brownish yellow (10YR6/8m), very pale brown (10YR7/4m) and yellowish red (5YR5/6m) sandy clay; moderate fine and medium angular blocky structure; smooth-ped fabric; hard (dry) friable (moist), slightly plastic and sticky (wet); light amount of fine quartz; clear boundary to:

90 – 120 cm; mottled light brownish grey (2.5Y6/2m), red (2.5YR4/6m) and strong brown (7.5YR5/6m) heavy clay with some sand; moderate fine and medium angular blocky structure; smooth-ped fabric; hard (dry), moderately friable (moist), plastic and sticky (wet); light amount of fine and medium quartz; some gleying.

STAWELL CLAY LOAM (Shallow Surface)
(one representative profile)

Profile B-16

Profile Reference: WM 15/28
Topography: Gully-floor in a strongly undulating plain.
Soil Classification: Dy 3.12/CL "gr" (10 cm).

Soil Description:

Surface Soil

0 – 10 cm; dark brown (7.5YR4/2m) clay loam "gritty"; apedal, hard setting; Earthy fabric, hard (dry), slightly plastic and moderately sticky (wet); light amount of fine quartz; water seepage at about 8-12 cm; clear boundary to:

Subsoil

10 – 50 cm; yellowish brown (10YR5/4m) and strong brown (7.5YR5/6m) sandy clay; moderate fine and medium angular blocky structure, smooth-ped fabric; hard (dry), friable (moist), plastic and sticky (wet); light amount of fine quartz; diffuse boundary to:

50 – 70 cm; as above but; mottled strong brown (7.5YR5/8m), pale brown (10YR6/3m) and red (2.5YR4/6m); bedrock at 70 cm.

MINOR SOIL TYPE 1
(two representative profiles)

(A) Profile B-17

Profile Reference: WM 15/36
Topography: Mid-very gentle slope in a gently undulating plain.
Soil Classification: Dr 2.62/SL (90 cm).

Soil Description:

Surface Soil

0 – 25 cm; brown (7.5YR4/4m) sandy loam; apedal, hard setting; hard (dry), friable (moist), non-plastic and non-sticky (wet); sharp boundary to:

25 – 90 cm; as above but; reddish yellow (5YR6/6m, 7/6d) sharp boundary to:

Subsoil

90 – 120 cm; yellowish red (5YR4/6m) sandy light clay; non-pedal to weak structure; hard (dry), friable (moist), slightly plastic and slightly sticky (wet).

(B) Profile B-18

Profile Reference: WM 15/50
Topography: Mid-gentle slope in a gently undulating plain.
Soil Classification: Dr 2.62/FSL (60 cm).

Soil Description:

Surface Soil

0 – 20 cm; brown (7.5YR5/4m) fine sandy loam; apedal, hard setting; slightly hard (dry), friable (moist), non-plastic and non-sticky (wet); sharp boundary to:

20 – 60 cm; as above but; reddish yellow (7.5YR6/6m, 7/6d); sharp boundary to:

Subsoil

60 – 90 cm; red (2.5YR4/6m) medium clay with fine sand non-pedal to weak fine and medium angular blocky structure; rough-ped fabric; moderately hard (dry), friable (moist), plastic and sticky (wet); gradual boundary to:

90 – 100 cm; mottled strong brown (7.5YR5/6m) and reddish brown (5YR4/4m) sandy loam, apedal, massive; slightly hard (dry), friable (moist), non-pedal and non-plastic (wet).

(D) Irrigation Water

In the vicinity of the surveyed vineyards, there are three dams, two of which are currently utilised to drip irrigate limited areas. The third dam is the largest (approximately 66 megalitre) and has been allocated for future irrigation.

The location of these dams is shown on Figure B-2 with a reference indicating the areas they currently irrigate. Analytical data obtained for water samples from the three dams are listed in Table B-4, below.

Table B-4 - Analytical Data for Dam Water Samples from Bests' Vineyards

Dam No.	EC *	TSS **	Cl^- ***	Soluble Cations				SAR $\phi\phi$
				Ca^{++}	Mg^{++}	Na^+		
	µS/cm	ppm	ppm	m.e/l	m.e/l	m.e/l	$\%\phi$	
1	112	101	7	0.33	0.30	0.40	38.8	0.71
2	133	115	16	0.26	0.30	0.82	59.4	1.55
3	144	123	18	0.22	0.28	1.01	66.9	2.02

* Electrical Conductivity at 20°C.
** Total Soluble Salts
*** Chlorides as sodium chloride (common salt)
ϕ Sodium Percentage = $100\ (Na^+)/Ca^{++} + Mg^{++} + Na^+$
$\phi\phi$ Sodium – Adsorption – Ratio = $Na^+/\sqrt{(Ca + Mg^{++})/2}$

Figure B-2: Locations of Dams and the areas they currently irrigate on Bests' Vineyards

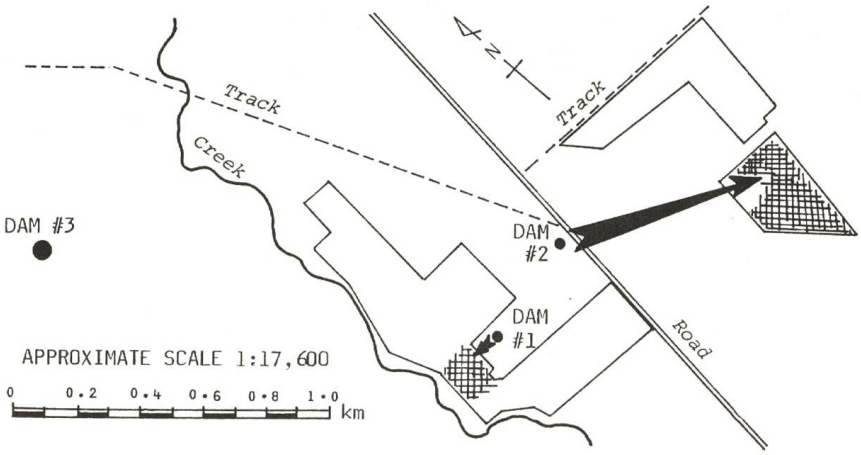
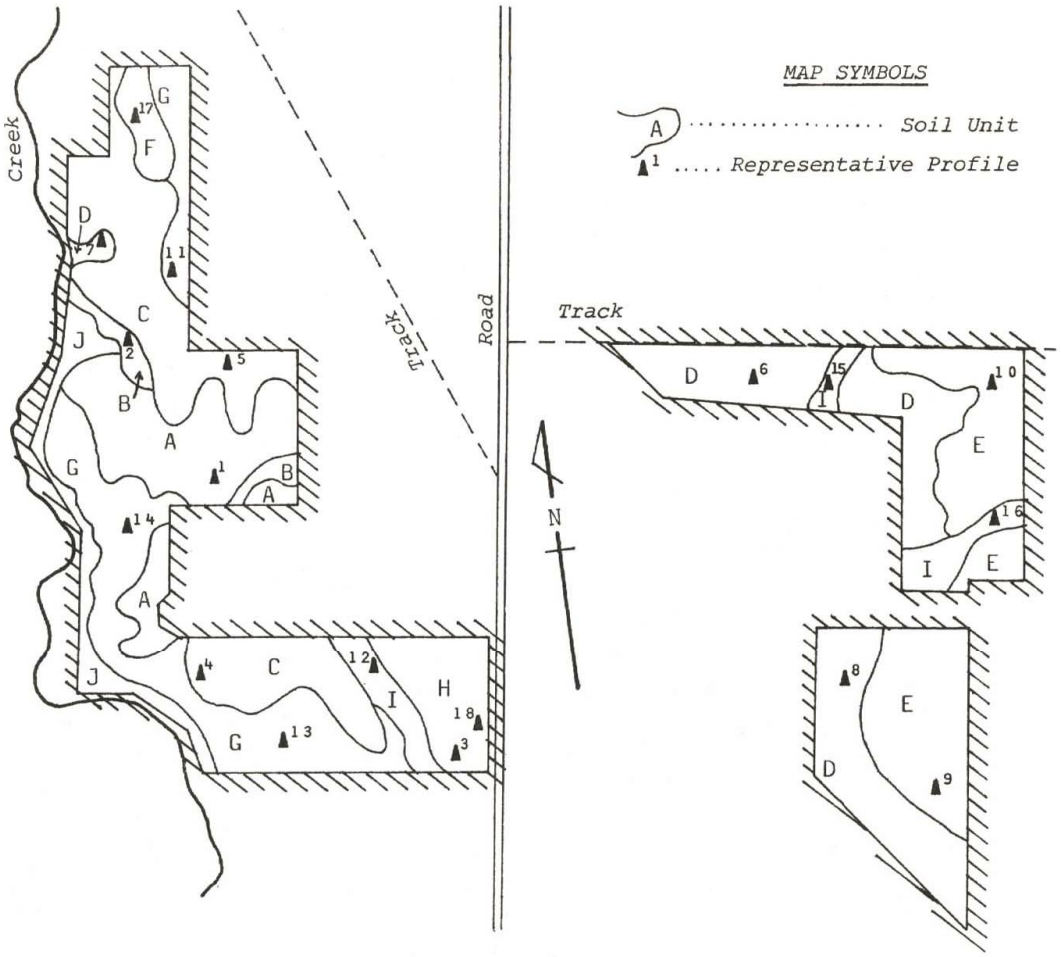


Figure B-3: Soil Map of Bests' Vineyards
Great Western, County of Borung, Victoria



DEPARTMENT OF AGRICULTURE, VICTORIA
DIVISION OF AGRICULTURAL CHEMISTRY
SOILS SECTION
Field Operations: 1980
Soil Surveyors: N.S. Badawy and N.B. Lewis
Map compiled and drawn by:
Nabil S. Badawy, Soils Officer

LEGEND

(i) MAPPING UNITS

Unit	Soils
A	Cl *[Concongella loam]*
B	Cl (d) *[Concongella loam (deep surface]*
C	GW1 *[Great Western loam]*
D	Ssl (d) *[Stawell sandy loam (deep surface)]*
E	Ssl (d & s) *[Stawell sandy loam (deep surface & stony profile)]*
F	M.T.1 *[Minor soil type 1]*
G	Soil Complex I: - Sl *[Stawell loam]* - Sscl *[Stawell sandy clay loam]* - Sscl (d) *[Stawell sandy clay loam (deep surface)]*
H	Soil Complex II: - Cl (d) *[Concongella loam (deep surface)]* - M.T.1 *[Minor soil type 1]*
I	Soil Complex III: Varied soils in gullies and depressions including: - Sl *[Stawell loam]* - Sscl (d & s) *[Stawell sandy clay loam (deep surface & stony profile)]* - Scl (sh) *[Stawell clay loam (shallow profile)]*
J	Soil Complex IV: Varied soils of the creek bank

(ii) REPRESENTATIVE PROFILES

Map Reference	Report Reference	Soil Classification	
		PPF (Northcote '79)	Soil Type
Δ 1	B- 1	Dr 2.32/L (15 cm)	Cl
Δ 2	B- 2	Dr 2.22/L "fs" (15 cm)	Cl (d)
Δ 3	B- 3	Dr 2.33/L (40 cm)	"
Δ 4	B- 4	Dr 3.42/L "fs" (30 cm)	GW1
Δ 5	B- 5	Dr 3.42/L "fs" (35 cm)	"
Δ 6	B- 6	Dy 3.41/SL (60 cm)	Ssl (d)
Δ 7	B- 7	Dy 3.42/FSL (50 cm)	"
Δ 8	B- 8	Dy 3.41/SL "gr" (45 cm)	"
Δ 9	B- 9	Dy 3.42/SL (55 cm)	Ssl (d & s)
Δ 10	B- 10	Dy 3.42/SL (50 cm)	"
Δ 11	B- 11	Dy 3.33/L "fs" (20 cm)	
Δ 12	B- 12	Dy 3.33/L (20 cm)	"
Δ 13	B- 13	Dy 3.42/FSCL (23 cm)	Sscl
Δ 14	B- 14	Dy 3.43/FSCL (30 cm)	Sscl (d)
Δ 15	B- 15	Dy 3.41/SCL (50 cm)	Sscl (d & s)
Δ 16	B- 16	Dy 3.12/CL "gr" (10 cm)	Scl (sh)
Δ 17	B- 17	Dr 2.62/SL (90 cm)	M.T.1
Δ 18	B- 18	Dr 2.62/FSL (60 cm)	"

Appendix B - Analytical Data for representative profiles from Bests' Vineyards

Depth (cm)	Field Texture (1)	pH	T.S.S. (%) (2)	Chloride "as NaCl" (%) (3)	Total N (%)	Org. C (%)	Exchangeable Cations "milliequivalents per 100 g soils"					Aggregate Stability		Moisture (%)	
							Ca	Mg	K	Na	H	Class (4)	Index (5)	@ -15 Bar (6)	@ $-^{1}/_{3}$ Bar (7)
PROFILE B-1; CONCONGELLA LOAM; Dr 2.32/L (15 cm)															
0 – 15	L	7.1	0.008	-	0.052	0.6	1.7	0.6	0.3	0.1	2.3	3	7	4.5	18.4
15 – 45	HC	7.1	0.026	-			2.3	4.1	0.7	0.5	4.8	1	16	16.1	28.6
45 – 70	HC	7.5	0.078	0.046			2.4	6.0	0.7	1.2	4.2	1	16	19.0 14.6	32.2
70 – 90	HC	7.6	0.186	0.136			2.2	6.0	0.6	1.6	1.8	1	16	12.2	29.1
90 – 100	HC	7.8	0.217	0.165			2.2	5.6	0.5	1.6	1.0	1	16		26.8
PROFILE B-2; CONCONGELLA LOAM (Deep Surface); Dr 2.22/L "fs" (35 cm)															
0 – 15	L (fs)	6.2	0.011	-	0.106	1.1	0.6	0.3	0.3	0.1	4.4	3	4	3.7	16.5
15 – 35	L (fs)	5.8	0.004	-			0.3	0.1	0.1	0.1	0.9	2	10	2.3	13.5
35 – 65	HC	6.8	0.012	-			3.5	3.2	0.4	0.2	5.4	3	5	14.8	24.8
65 – 100	FSC	7.1	0.010	-			1.8	3.6	0.3	0.2	3.8	3	7	11.3	23.6
PROFILE B-3; CONCONGELLA LOAM (Deep Surface); Dr 2.33/L (40 cm)															
0 – 40	L	7.5	0.008	-	0.059	0.66	2.2	0.5	0.3	0.1	2.8	3	8	4.7	20.3
40 – 70	HC	8.1	0.012	-			3.8	3.2	0.5	0.2	3.2	3	8	13.0	24.6
70 – 100	MC (fs)	8.3	0.019	-			1.7	3.8	0.4	0.6	2.4	1	16	11.1	21.0
PROFILE B-4; GREAT WESTERN LOAM; Dr 3.42/L "fs" (30 cm)															
0 – 20	L (fs)	6.8	0.009	-	0.063	0.7	2.0	0.4	0.3	0.1	2.8	3	3	3.4	16.6
20 – 30	L (fs)	7.4	0.008	-			1.3	0.7	0.1	0.1	1.0	3	6	3.2	14.4
30 – 60	HC	7.5	0.028	-			2.2	5.0	0.3	1.3	5.0	1	14	15.7	28.0
60 – 80	HC	8.2	0.050	0.026			1.7	6.6	0.4	2.1	1.8	1	16	16.7	31.3
80 – 100	HC	8.5	0.140	0.090			1.7	7.0	0.4	3.4	1.3	1	14	14.5	29.7

Depth (cm)	Field Texture (1)	pH	T.S.S. (%) (2)	Chloride "as NaCl" (%) (3)	Total N (%)	Org. C (%)	Exchangeable Cations "milliequivalents per 100 g soils"					Aggregate Stability		Moisture (%)	
							Ca	Mg	K	Na	H	Class (4)	Index (5)	@ -15 Bar (6)	@ -1/3 Bar (7)
PROFILE B-5; GREAT WESTERN LOAM; Dr 3.42/L "fs" (35 cm)															
0 – 20	L (fs)	7.0	0.011	-								2	10	4.0	20.6
20 – 35	L (fs)	7.2	0.004	-								2	12	4.3	19.6
35 – 65	HC	7.0	0.015	-								3	2	15.3	28.2
65 – 80	HC	7.1	0.024	-								3	2	15.1	29.1
80 – 100	HC	7.8	0.031	-								1	16	16.4	31.8
PROFILE B-6; STAWELL SANDY LOAM (Deep Surface); Dy 3.41/SL (60 cm)															
0 – 10	SL	6.1	0.005	-	0.088	1.3	0.9	0.2	0.1	0.1	3.7	2	10	3.6	9.9
10 – 30	LS	6.0	0.001	-			0.4	0.1	0.1	0.1	0.9	2	10	1.5	8.1
30 – 60	LS	6.4	0.001	-			0.5	0.1	0.1	0.1	0.5	2	10	1.9	7.1
60 – 90	HC	6.5	0.011	-			3.0	5.1	0.5	0.3	8.6	3	8	23.9	31.8
90 – 120	HC	6.3	0.013	-			2.1	4.5	0.4	0.4	9.8	3	8	24.4	31.7
PROFILE B-7; STAWELL SANDY LOAM (Deep Surface); Dy 3.42/FSL (50 cm)															
0 – 15	FSL	6.5	0.014	-	0.103	1.1	1.0	0.3	0.6	0.1	4.6	2	9	3.5	17.4
15 – 50	FSL	6.1	0.005	-			0.5	0.2	0.1	0.1	1.5	3	6	2.5	12.0
50 – 65	MC (fs)	6.5	0.012	-			2.7	2.0	0.3	0.2	3.2	3	4	11.7	20.9
65 – 90	FSCL (h)	6.8	0.012	-			1.5	2.5	0.2	0.2	3.1	3	4	10.7	20.4
90 – 105	FSCL (h)	7.0	0.010	-			0.9	2.9	0.2	0.1	3.4	5	0	8.5	17.2
105 – 120	FSCL	7.2	0.007	-			0.5	1.9	0.2	0.1	1.4	3	5	4.4	12.9
PROFILE B-8; STAWELL SANDY LOAM (Deep Surface); Dy 3.41/SL "gr" (45 cm)															
0 – 10	SL (gr)	7.2	0.011	-								2	10	4.9	12.4
10 – 45	LS (gr)	6.2	0.005	-								2	10	2.1	8.7
45 – 85	HC	6.2	0.016	-								5	0	21.7	32.6
85 – 100	HC	6.0	0.015	-								5	0	21.1	32.9

Depth (cm)	Field Texture (1)	pH	T.S.S. (%) (2)	Chloride "as NaCl" (%) (3)	Total N (%)	Org. C (%)	Exchangeable Cations "milliequivalents per 100 g soils"					Aggregate Stability		Moisture (%)	
							Ca	Mg	K	Na	H	Class (4)	Index (5)	@ -15 Bar (6)	@ -1/3 Bar (7)
PROFILE B-9; STAWELL SANDY LOAM; (Deep Surface & Stony Profile); Dy 3.42/SL (55 cm)															
0 – 10	SL	6.6	0.012	-	0.113	1.7	1.3	0.3	0.3	0.1	4.9	3	8	5.3	9.1
10 – 55	LS	6.5	0.008	-			0.5	0.3	0.2	0.1	3.2	3	8	3.8	7.6
55 – 75	HC	6.5	0.014	-			0.5	3.9	0.6	0.1	10.1	5	0	17.8	23.4
75 – 90	HC (gr)	6.5	0.012	-			0.2	3.3	0.4	0.1	7.6	5	0	16.0	20.4
PROFILE B-10; STAWELL SANDY LOAM (Deep Surface & Stony Profile); Dy 3.42/SL (50 cm)															
0 – 10	SL (gr)	6.3	0.006	-								3	8	4.6	11.5
10 – 50	LS (gr)	6.5	0.002	-								2	10	2.1	7.8
50 – 65	MC (gr)	6.9	0.007	-								3	8	16.8	23.5
PROFILE B-11; STAWELL LOAM; Dy 3.33/L "fs" (20 cm)															
0 – 15	L (fs)	6.3	0.016	-								2	10	6.2	18.1
15 – 20	L (fs)	6.0	0.010	-								2	10	7.2	21.8
20 – 35	HC	6.3	0.023	-								2	12	18.2	31.3
35 – 65	HC	8.2	0.089	0.033								1	16	20.7	36.7
65 – 100	HC	9.0	0.203	0.090								1	16	21.1	37.7
PROFILE B-12; STAWELL LOAM; Dy 3.33/L (20 cm)															
0 – 20	L	7.3	0.012	-	0.057	0.5	1.0	0.6	0.3	0.2	3.8	2	10	5.8	23.5
20 – 50	HC	8.2	0.055	0.002			2.9	5.9	0.5	2.3	5.2	1	16	20.2	35.0
50 – 80	HC	8.9	0.112	0.041			2.7	7.7	0.4	3.4	1.4	1	16	21.0	34.8
80 – 100	MC	9.2	0.087	0.041			1.8	6.6	0.3	3.0	0	1	16	14.5	30.0
PROFILE B-13; STAWELL SANDY CLAY LOAM; Dy 3.42/FSCL (23 cm)															
0 – 23	FSCL	7.1	0.013	-								2	10	5.0	25.7
23 – 53	HC	6.7	0.017	-								2	11	20.9	33.2
53 – 80	HC	6.6	0.023	-								3	2	17.7	31.9
80 – 100	HC	7.1	0.038	-										17.9	32.8

Depth (cm)	Field Texture (1)	pH	T.S.S. (%) (2)	Chloride "as NaCl" (%) (3)	Total N (%)	Org. C (%)	Exchangeable Cations "milliequivalents per 100 g soils" Ca	Mg	K	Na	H	Aggregate Stability Class (4)	Index (5)	Moisture (%) @ -15 Bar (6)	@ -1/3 Bar (7)
PROFILE B-14; STAWELL SANDY CLAY LOAM (Deep Surface); Dy 3.43/FSCL (30 cm)															
0 – 15	FSCL	7.2	0.078	0.008								3	4	3.8	22.4
15 – 30	FSCL	7.5	0.014	-								3	8	3.8	19.7
30 – 60	HC	7.6	0.066	0.007								2	10	18.7	34.9
60 – 90	HC	8.8	0.085	0.008								1	14	14.6	28.8
90 – 110	SC-CyS	9.0	0.027	-								2	12	4.8	14.2
PROFILE B-15; STAWELL SANDY CLAY LOAM (Deep Surface & Stony Profile); Dy 3.41/SCL (50 cm)															
0 – 10	SCL	6.3	0.012	-	0.157	2.6	1.9	1.1	0.4	0.1	9.0	2	10	8.1	20.7
10 – 50	SL	6.8	0.002	-			0.7	0.6	0.1	0.1	1.4	2	10	2.7	9.4
50 – 90	SC	6.3	0.009	-			0.4	2.0	0.2	0.2	3.2	5	0	7.9	13.7
90 – 120	HC (s)	6.0	0.022	-			0.4	3.9	0.2	0.8	10.1	5	0	18.0	26.8
PROFILE B-16; STAWELL CLAY LOAM (Shallow Surface); Dy 3.12/CL "gr" (10 cm)															
0 – 10	CL (gr)	6.6	0.012	-	0.154	2.6	2.1	1.7	0.4	0.2	12.0	2	10	11.3	26.2
10 – 50	SC	6.8	0.009	-			1.2	2.5	0.4	0.2	7.2	5	0	12.7	22.4
50 – 70	SC	6.8	0.010	-			0.6	2.9	0.3	0.3	7.0	5	0	14.1	22.3
PROFILE B-17; MINOR SOIL TYPE 1; Dr 2.62/SL (90 cm)															
0 – 25	SL	6.5	0.007	-	0.077	0.9	0.7	0.2	0.3	0.1	3.4	3	8	2.7	9.6
25 – 90	SL	6.5	0.002	-			0.3	0.1	0.1	0.1	0.8	2	10	1.4	8.2
90 – 120	SC (lt)	7.8	0.007	-			2.1	1.7	0.2	0.1	1.5	2	10	7.6	15.0
PROFILE B-18; MINOR SOIL TYPE 1; Dr 2.62/FSL (60 cm)															
0 – 20	FSL	7.0	0.011	-								2	10	3.1	17.3
20 – 60	FSL	7.1	0.003	-								2	10	1.8	11.8
60 – 90	MC (fs)	7.1	0.018	-								3	7	10.8	19.6
90 – 100	SL	7.2	0.017	-								5	0	6.1	12.1

(1) Field Texture; see Appendix G for definitions and symbols used.

(2) Total Soluble Salts (%) = Electrical Conductivity $(\mu S/cm) \times 3.3 \times 10^{-4}$.

(3) The dashes recorded in this column indicate negligible amounts of sodium chloride.

(4) Aggregate stability Class (Emerson 1967).

(5) Aggregate Dispersion Index (Loveday 1974).

(6) Moisture (%) at –15 Bar; approximately "Wilting Point", see Appendix G.