14/96

MELBUR CHINA CLAY TIP - SCARCEWATER SITE

AGRICULTURAL LAND CLASSIFICATION SURVEY

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MELBUR CHINA CLAY TIP - SCARCEWATER SITE

AGRICULTURAL LAND CLASSIFICATION SURVEY

INTRODUCTION

1. This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of 94.8 ha of land at Scarcewater near St. Austell. Field survey was based on 99 auger borings and 4 soil profile pits, and was completed in April 1996.

2. The survey was conducted by the Resource Planning Team of ADAS Taunton Statutory Group on behalf of MAFF Land Use Planning Unit in its statutory role in connection with an application to the Minerals Planning Authority under the Town and Country Planning Act, 1990 for an extension to the Melbur China Clay Tip.

3. Information on climate, geology and soils, and from previous ALC surveys was considered and is presented in the relevant section. Apart from the published regional ALC map (MAFF, 1977), which shows the site at a reconnaissance scale as Grade 3, the site was previously surveyed in 1976 at a scale of 1:25 000 (ADAS, 1976). This previous survey shows the site as mainly Subgrade 3b with Subgrade 3a and Grade 2 in the South and East around Pennance Farm. Although this was accurate at the time and still gives an indication of trends in land quality, the classification system in use at that time is no longer current. It is therefore superseded by the current survey which uses the Revised Guidelines and Criteria for grading quality or agricultural land (MAFF, 1988). Grade descriptions are summarised in Appendix I.

4. At the time of survey land cover was mainly ley grass, cereals and maize. Other land which was not surveyed included agricultural buildings, tracks and domestic houses.

SUMMARY

5. The distribution of ALC grades is shown on the accompanying 1:10 000 scale ALC map. The detail of information shown at this scale is appropriate to the intensity of field survey but could be misleading if enlarged or applied to small areas. Areas are summarised in Table 1.

Table 1: Distribution of ALC grades: Scarcewater

Grade	Area (ha)	% Surveyed Area (90.2 ha)
3a	30.1	33.4
3b	55.3	61.3
4	4.8	5.3
Other land	4.6	
Total site area	94.8	

6. 33.4% of the land surveyed was found to be best and most versatile. This was Subgrade 3a, all Wetness Class I, which with mainly medium clay loam topsoil indicates a moderate limitation due to workability in view of the relatively severe climatic conditions. The remainder of the land was found to have more serious moderate and severe limitations mainly due to

wetness, with gleying evident frequently within 40cm (Wetness Class III) or at least within 70cm (Wetness Class II). A small area at the east of the site was found to be found to be limited by gradient.

CLIMATE

7. Estimates of climatic variables for this site were derived from the published agricultural climate dataset "Climatological Data for Agricultural Land Classification" (Meteorological Office, 1989) using standard interpolation procedures. Data for key points around the site are given in Table 2 below.

8. Since the ALC grade of land is determined by the most limiting factor present, overall climate is considered first because it can have an overriding influence by restricting land to a lower grade despite more favourable site and soil conditions. Parameters used for assessing overall climate are accumulated temperature, a measure of relative warmth and average annual rainfall, a measure of overall wetness. The results shown in Table 2 indicate that there is an overall climatic limitation which limits the land to Grade 2.

9. Climatic variables also affect ALC grade through interactions with soil conditions. The most important interactive variables are Field Capacity (FC) days which are used in assessing soil wetness and potential Moisture Deficits calculated for wheat and potatoes, which are compared with the moisture available in each profile in assessing soil droughtiness limitations. These are described in later sections.

Table 2: Climatic Interpolations: Scarcewater

Grid Reference		SW 927 537	SW 922 544
Altitude (m)		75	120
Accumulated Temperature (day °C)		1554	1503
Average Annual Rainfall (mm)		1168	1218
Overall Climatic Grade		2	2
Field Capacity Days		231	237
Moisture deficit (mm):	Wheat	85	77
	Potatoes	74	63

10. A small area at the highest central parts of the site was observed to be subject to a local exposure limitation likely to restrict the land to Grade 2.

RELIEF

11. Altitude ranges from 75 metres in the valley below Pennance Farm to 120 metres at the highest central part of the site. Slopes are mainly gentle and moderate, which are not limiting, although one small area of strongly sloping (8 - 11°) was found at the east end of the site.

GEOLOGY AND SOILS

13. The underlying geology of the site is shown on the published geology map (IGS, 1982) as Meadfoot Beds of the Lower Devonian period. These are composed of calcareous slate, grit and thin limestones. The recent ALC survey found parent materials of mainly pinkish grey shale within 100cm.

14. Soils were mapped by the Soil Survey of England and Wales at a reconnaissance scale of 1:250 000 (SSEW, 1983) as mainly Hafren and Manod associations.

15. Hafren association soils are described as loamy permeable upland soils over rock with a wet peaty horizon and bleached sub-surface horizon, often with thin iron pan and some peat on higher ground.

16. Manod association soils are described as well drained fine loamy or fine silty soils over rock with shallow soils in places and bare rock locally.

17. The current survey found that the core of the survey area matched most closely to the description of Hafren association while soils matching the description of Manod association were found at either end of the survey area particularly in the south east.

AGRICULTURAL LAND CLASSIFICATION

18. The distribution of ALC grades found by the current survey is shown on the accompanying 1:10 000 scale map and areas are summarised in Table 1. The detail of information shown at this scale is appropriate to the intensity of field survey but could be misleading if enlarged or applied to small areas.

Subgrade 3a

19. Observations in the area shown as Subgrade 3a found mainly medium clay loam topsoil texture, which with no evidence of wetness in the profile indicates a moderate limitation due to workability.

20. Typical profiles in this mapping unit show a deep bright brown topsoil to around 35cm and a pale pinkish very stony slatey parent material below around 50cm. This third horizon may show few ochreous mottles but these can be attributed, in the main, to rotting stones. Horizon 2 is mainly ochreous, 7.5YR66, but frequently with considerable topsoil mixing giving some variation in colour. Where despite the presence of ochreous background colours, no pale matrix or ped face colour could be identified the definition of gleying was not met and the profile was assessed as Wetness Class I (see Appendix II). These conditions are illustrated by pits 2 and 3.

21. Laboratory analysis found 2 topsoil samples to be borderline heavy clay loam with 27% clay content. These have been included as medium clay loam on the basis of hand texturing characteristics and observed easy working during seed bed preparation at the time of field survey. A further 5 topsoil samples proved to be medium clay loam, one of them borderline to sandy silt loam.

Subgrade 3b

22. A large part of the central area shows dark brown slightly humose topsoil, generally with gleying evident as conspicuous ochreous mottling immediately below. This is believed to represent a vestigial iron pan and indicates mainly Wetness Class III, ALC Subgrade 3b with medium clay loam topsoil.

23. Just below the central ridge and particularly to the east, better drainage and brighter topsoil colours are found, occasionally assessed as Wetness Class II with evidence of gleying at depth, but more commonly Wetness Class III with marginal evidence of gleying in horizon 2. This is illustrated by pit 4 which is considered to be borderline between Subgrades 3a and 3b and is typical of many of the observations included within the Subgrade 3b mapping unit.

Grade 4

24. A small area of Grade 4 was found on the alluvial flood plain around Terras village. This was found to have a heavy silty clay loam topsoil, gleyed from the surface (Wetness Class IV) and with variable texture subsoil including coarse sand and grit.

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14 May 1996

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APPENDIX I

DESCRIPTION OF GRADES AND SUBGRADES

Grade 1 - excellent quality agricultural land

Land with no or very minor limitations to agricultural use. A very wide range of agricultural and horticultural crops can be grown and commonly include top fruit, soft fruit, salad crops and winter harvested vegetables. Yields are high and less variable than on land of lower quality.

Grade 2 - very good quality agricultural land

Land with minor limitations which affect crop yield, cultivations or harvesting. A wide range of agricultural and horticultural crops can usually be grown but on some land in the grade there may be reduced flexibility due to difficulties with the production of the more demanding crops such as winter harvested vegetables and arable root crops. The level of yield is generally high but may be lower or more variable than Grade 1.

Grade 3 - *good to moderate quality agricultural land*

Land with moderate limitations which affect the choice of crops, timing and type of cultivation, harvesting or the level of yield. Where more demanding crops are grown yields are generally lower or more variable than on land in Grades 1 and 2.

Subgrade 3a - good quality agricultural land

Land capable of consistently producing moderate to high yields of a narrow range of arable crops, especially cereals, or moderate yields of a wide range of crops including cereals, grass, oilseed rape, potatoes, sugar beet and the less demanding horticultural crops.

Subgrade 3b - moderate quality agricultural land

Land capable of producing moderate yields of a narrow range of crops, principally cereals and grass, or lower yields of a wider range of crops or high yields of grass which can be grazed or harvested over most of the year.

Grade 4 - poor quality agricultural land

Land with severe limitations which significantly restrict the range of crops and/or level of yields. It is mainly suited to grass with occasional arable crops (eg cereals and forage crops) the yields of which are variable. In most climates, yields of grass may be moderate to high but there may be difficulties in utilisation. The grade also includes very droughty arable land.

Grade 5 - very poor quality agricultural land

Land with very severe limitations which restrict use to permanent pasture or rough grazing, except for occasional pioneer forage crops.

Source: MAFF (1988) Agricultural Land Classification of England and Wales Revised Guidelines and Criteria for Grading the Quality of Agricultural Land, MAFF Publications, Alnwick.

APPENDIX II

DEFINITION OF SOIL WETNESS CLASSES

Soil wetness is classified according to the depth and duration of waterlogging in the soil profile.

Wetness Class I

The soil profile is not wet within 70 cm depth for more than 30 days in most years.

Wetness Class II

The soil profile is wet within 70 cm depth for 31-90 days in most years or, if there is no slowly permeable layer within 80 cm depth, it is wet within 70 cm for more than 90 days, but not wet within 40 cm depth for more than 30 days in most years.

Wetness Class III

The soil profile is wet within 70 cm depth for 91-180 days in most years or, if there is no slowly permeable layer within 80 cm depth, it is wet within 70 cm for more than 180 days, but only wet within 40 cm depth for between 31 and 90 days in most years.

Wetness Class IV

The soil profile is wet within 70 cm depth for more than 180 days but not within 40 cm depth for more than 210 days in most years or, if there is no slowly permeable layer within 80 cm depth, it is wet within 40 cm depth for 91-210 days in most years.

Wetness Class V

The soil profile is wet within 40 cm depth for 211-335 days in most years.

Wetness Class VI

The soil profile is wet within 40 cm depth for more than 335 days in most years.

Notes: The number of days specified is not necessarily a continuous period.

'In most years' is defined as more than 10 out of 20 years.

Source: Hodgson, J M (In preparation) Soil Survey Field Handbook, Revised Edition.

APPENDIX III

ABBREVIATIONS AND TERMS USED IN SURVEY DATA

Soil pit and auger boring information collected during ALC survey is held on a computer database and is reproduced in this report. Terms used and abbreviations are set out below. These conform to definitions contained in the Soil Survey Field Handbook (Hodgson, 1974).

1. Terms used on computer database, in order of occurrence.

GRID REF: National 100 km grid square and 8 figure grid reference.

LAND USE: At the time of survey

WHT:	Wheat	**SBT:**	Sugar Beet	**HTH:**	Heathland
BAR:	Barley	**BRA:**	Brassicas	**BOG:**	Bog or Marsh
OAT:	Oats	**FCD:**	Fodder Crops	**DCW:**	Deciduous Wood
CER:	Cereals	**FRT:**	Soft and Top Fruit	**CFW:**	Coniferous Woodland
MZE:	Maize	**HRT:**	Horticultural Crops	**PLO:**	Ploughed
OSR:	Oilseed Rape	**LEY:**	Ley Grass	**FLW:**	Fallow (inc. Set aside)
POT:	Potatoes	**PGR:**	Permanent Pasture	**SAS:**	Set Aside (where known)
LIN:	Linseed	**RGR:**	Rough Grazing	**OTH:**	Other
BEN:	Field Beans	**SCR:**	Scrub		

GRDNT: Gradient as estimated or measured by hand-held optical clinometer.

GLEY, SPL: Depth in centimetres to gleying or slowly permeable layer.

AB (WHEAT/POTS): Crop-adjusted available water capacity.

MB (WHEAT/POTS): Moisture Balance. (Crop adjusted AP - crop potential MD)

DRT: Best grade according to soil droughtiness.

If any of the following factors are considered significant, 'Y' will be entered in the relevant column.

MREL:	Microrelief limitation	**FLOOD:**	Flood risk	**EROSN:**	Soil erosion risk
EXP:	Exposure limitation	**FROST:**	Frost prone	**DIST:**	Disturbed land
CHEM:	Chemical limitation				

LIMIT: The main limitation to land quality: The following abbreviations are used.

OC:	Overall Climate	**AE:**	Aspect	**EX:**	Exposure
FR:	Frost Risk	**GR:**	Gradient	**MR:**	Microrelief
FL:	Flood Risk	**TX:**	Topsoil Texture	**DP:**	Soil Depth
CH:	Chemical	**WE:**	Wetness	**WK:**	Workability
DR:	Drought	**ER:**	Erosion Risk	**WD:**	Soil Wetness/Droughtiness
ST:	Topsoil Stoniness				

TEXTURE: Soil texture classes are denoted by the following abbreviations:-

S:	Sand	**LS:**	Loamy Sand	**SL:**	Sandy Loam
SZL:	Sandy Silt Loam	**CL:**	Clay Loam	**ZCL**	Silty Clay Loam
ZL:	Silt Loam	**SCL:**	Sandy Clay Loam	**C:**	Clay
SC:	Sandy clay	**ZC:**	Silty clay	**OL:**	Organic Loam
P:	Peat	**SP:**	Sandy Peat	**LP:**	Loamy Peat
PL:	Peaty Loam	**PS:**	Peaty Sand	**MZ:**	Marine Light Silts

For the sand, loamy sand, sandy loam and sandy silt loam classes, the predominant size of sand fraction will be indicated by the use of the following prefixes:-

F: Fine (more than 66% of the sand less than 0.2mm)
M: Medium (less than 66% fine sand and less than 33% coarse sand)
C: Coarse (more than 33% of the sand larger than 0.6mm)

The clay loam and silty clay loam classes will be sub-divided according to the clay content:
M: Medium (< 27% clay) **H:** heavy (27 - 35% clay)

MOTTLE COL: Mottle colour using Munsell notation.

MOTTLE ABUN: Mottle abundance, expressed as a percentage of the matrix or surface described.

F: few <2% **C:** common 2 - 20% **M:** many 20 - 40% **VM:** very many 40%+

MOTTLE CONT: Mottle contrast

F: faint - indistinct mottles, evident only on close inspection
D: distinct - mottles are readily seen
P: Prominent - mottling is conspicuous and one of the outstanding features of the horizon.

PED. COL: Ped face colour using Munsell notation.

GLEY: If the soil horizon is gleyed a 'Y' will appear in this column. If slightly gleyed, an 'S' will appear.

STONE LITH: Stone Lithology - One of the following is used.

HR:	All hard rocks and stones	**SLST:**	Soft oolitic or dolimitic limestone
CH:	Chalk	**FSST:**	Soft, fine grained sandstone
ZR:	Soft, argillaceous, or silty rocks	**GH:**	Gravel with non-porous (hard) stones
MISST:	Soft, medium grained sandstone	**GS:**	Gravel with porous (soft) stones
SI:	Soft weathered igneous or metamorphic rock		

Stone contents are given in % by volume for sizes >2cm, >6cm and total stone >2mm.

STRUCT: The degree of development, size and shape of soil peds are described using the following notation

Degree of development	**WK:**	Weakly developed	**MD:**	Moderately developed
	ST:	Strongly developed		
Ped size	**F:**	Fine	**M:**	Medium
	C:	Coarse	**VC:**	Very coarse
Ped Shape	**S:**	Single grain	**M:**	Massive
	GR:	Granular	**AB:**	Angular blocky
	SAB:	Sub-angular blocky	**PR:**	Prismatic
	PL:	Platy		

CONSIST: Soil consistence is described using the following notation:

L:	Loose	**VF:**	Very Friable	**FR:**	Friable	**FM:**	Firm
VM:	Very firm	**EM:**	Extremely firm	**EH:**	Extremely Hard		

SUBS STR: Subsoil structural condition recorded for the purpose of calculating profile droughtiness: **G:** Good **M:** Moderate **P:** Poor

POR: Soil porosity. If a soil horizon has poor porosity with less than 0.5% biopores >0.5mm, a 'Y' will appear in this column.

IMP: If the profile is impenetrable to rooting a 'Y' will appear in this column at the appropriate horizon.

SPL: Slowly permeable layer. If the soil horizon is slowly permeable a 'Y' will appear in this column.

CALC: If the soil horizon is calcareous with naturally occurring calcium carbonate exceeding 1% a 'Y' will appear this column.

2. Additional terms and abbreviations used mainly in soil pit descriptions.

STONE ASSESSMENT:

VIS:	Visual	**S:**	Sieve	**D:**	Displacement

MOTTLE SIZE:

EF:	Extremely fine <1mm	**M:**	Medium 5-15mm
VF:	Very fine 1-2mm>	**C:**	Coarse >15mm
F:	Fine 2-5mm		

MOTTLE COLOUR: May be described by Munsell notation or as ochreous (OM) or grey (GM).

ROOT CHANNELS: In topsoil the presence of 'rusty root channels' should also be noted.

MANGANESE CONCRETIONS: Assessed by volume

N:	None		**M:**	Many	20-40%
F:	Few	<2%	**VM:**	Very Many	>40%
C:	Common	2-20%			

STRUCTURE: Ped Development *

WA:	Weakly adherent	**M:**	Moderately developed
W:	Weakly developed	**S:**	Strongly developed

POROSITY:

P: Poor - less than 0.5% biopores at least 0.5mm in diameter
G: Good - more than 0.5% biopores at least 0.5mm in diameter

ROOT ABUNDANCE:

The number of roots per $100cm^2$:		Very Fine and Fine	Medium and Coarse
F:	Few	1-10	1 or 2
C:	Common	10.25	2 - 5
M:	Many	25-200	>5
A:	Abundant	>200	

ROOT SIZE

VF:	Very fine	<1mm	**M:**	Medium	2 - 5mm
F:	Fine	1-2mm	**C:**	Coarse	>5mm

HORIZON BOUNDARY DISTINCTNESS:

Sharp:	<0.5cm	**Gradual:**	6 - 13cm
Abrupt:	0.5 - 2.5cm	**Diffuse:**	>13cm
Clear:	2.5 - 6cm		

HORIZON BOUNDARY FORM: Smooth, wavy, irregular or broken.*

* See Soil Survey Field Handbook (Hodgson, 1974) for details.

SITE NAME	PROFILE NO.	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
Scarcewater	Pit 1 (Asp 25)	3° SE	Ley	Av Rainfall: 1218 mm ATO: 1503 day °C	Meadfoot Beds: calcareous slate, grit and thin limestone
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY	FC Days: 236 Climatic Grade: 2 Exposure Grade: 2	SOIL SAMPLE REFERENCES
14.96	26.03.96	SW 923542	PB		PB355

Horizon No.	Lowest Av. Depth (cm)	Texture	Matrix (Ped Face) Colours	Stoniness: Size, Type, and Field Method	Mottling Abundance, Contrast, Size and Colour	Mangan Concs	Structure: Ped Development Size and Shape	Consistence	Structural Condition	Pores (Fissures)	Roots: Abundance and Size	Calcium Carbonate Content	Horizon Boundary: Distinctness and form
1	20	MCL	7.5YR42	10% HR (VIS)	0	0	MM,CSAB	Fr	-	G	MF,VF	-	Ab wavy
2	40	ZC	7.5YR63	15% HR (VIS)	MDCO,G 75YR58 10YR73	0	WCSAB	Fr	M	G	CVF	-	Ab irregular
3	80+	ZC	7.5YR64	40% HR (VIS)	FDMO* 75YR58	0	WM,CSAB	Fr	G	(G)	0	-	

Profile Gleyed From: 20

Depth to Slowly Permeable Horizon: -

Wetness Class: III

Wetness Grade: 3b

Available Water Wheat: 117 mm

Potatoes: 97 mm

Moisture Deficit Wheat: 79 mm

Potatoes: 65 mm

Moisture Balance Wheat: +38 mm

Potatoes: +38 mm

Droughtiness Grade: 1 (Calculated to 100 cm)

Final ALC Grade: 3b

Main Limiting Factor(s): We

Remarks: *Mottles in H3 mainly associated with rotting stones therefore horizon not gleyed.

SITE NAME	PROFILE NO.	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
Scarcewater	Pit 2 (Asp 90)	4° N	PLO	Av Rainfall: 1196 mm ATO: 1526 day °C	Calcareous slate, grit
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY	FC Days: 235 Climatic Grade: 2	SOIL SAMPLE REFERENCES
14.96	18.4.96	SW 9250 5360	PB	Exposure Grade: -	PB 357

Horizon No.	Lowest Av. Depth (cm)	Texture	Matrix (Ped Face) Colours	Stoniness: Size,Type, and Field Method	Mottling Abundance, Contrast, Size and Colour	Mangan Concs	Structure: Ped Development Size and Shape	Consistence	Structural Condition	Pores (Fissures)	Roots: Abundance and Size	Calcium Carbonate Content	Horizon Boundary: Distinctness and form
1	34	HCL/ MCL	7.5YR44	1% >2 cm 5% < 2 cm 6% HR (S + D)	0	0	WM,FSAB	Fr	G	G	MF,VF	-	Grad smooth
2	50	HCL	7.5YR66 7.5YR44	2% > 2 cm 13% < 2 cm 15% HR (S + D)	0	0	MM,FSAB	Fr	G	G	CVF	-	Clear smooth
3	90+	ZC	5YR64	30% > 2cm 17% <2 cm 47% HR, ZR (S+ D)	0	0	Too stony	-	-	(G)	0	-	

Profile Gleyed From: -

Depth to Slowly Permeable Horizon: -

Wetness Class: I

Wetness Grade: 3a

Available Water Wheat: 118 mm

Potatoes: 103 mm

Moisture Deficit Wheat: 79 mm

Potatoes: 65 mm

Moisture Balance Wheat: +39 mm

Potatoes: +38 mm

Droughtiness Grade: 1 (Calculated to 120 cm)

Final ALC Grade: 3a

Main Limiting Factor(s): Wk

Remarks: H2 shows topsoil mixing.

H1 PSD shows 27% of clay; ie. Borderline HCL/MCL. Taken as MCL on basis on hand texturing characteristics and observed ease of working in seedbed preparation at the time of survey.

SITE NAME	PROFILE NO.	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
Scarcewater	Pit 3 (Asp 69)	4°	Ley	Av Rainfall: 1196 mm ATO: 1526 day °C FC Days: 235 Climatic Grade: 2 Exposure Grade: -	Calcareous slate, grit
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY		SOIL SAMPLE REFERENCES
14.96	18.4.96	SW 9290 5390	PB		PB 358

Horizon No.	Lowest Av. Depth (cm)	Texture	Matrix (Ped Face) Colours	Stoniness: Size, Type, and Field Method	Mottling Abundance, Contrast, Size and Colour	Mangan Concs	Structure: Ped Development Size and Shape	Consistence	Structural Condition	Pores (Fissures)	Roots: Abundance and Size	Calcium Carbonate Content	Horizon Boundary: Distinctness and form
1	36	MCL	7.5YR44	1% > 2 cm 11% < 2 cm 12% HR (S + D)	0	0	MM,FSAB	Fr	G	G	MF,VF	-	Clear smooth
2	48	HCL	7.5YR66 7.5YR44	2% > 2 cm 5% < 2 cm 7% HR (S + D)	0*	0	MC,MSAB	Fr	M	G	CF,VF	-	Clear smooth
3	100+	ZC	5YR64	10% > 2 cm 32% < 2 cm 42% ZR (S + D)	0	0	WCAB	Fr	M	(G)	FVF	-	-

Profile Gleyed From: -

Depth to Slowly Permeable Horizon: -

Wetness Class: I

Wetness Grade: 3a

Available Water Wheat: 125 mm

Potatoes: 102 mm

Moisture Deficit Wheat: 79 mm

Potatoes: 65 mm

Moisture Balance Wheat: +46 mm

Potatoes: +37 mm

Droughtiness Grade: 1 (Calculated to 120 cm)

Final ALC Grade: 3a

Main Limiting Factor(s): Wk

Remarks: * H2 shows topsoil mixing.

SITE NAME	PROFILE NO.	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
Scarcewater	Pit 4 (Asp 45)	3° W	PGR	Av Rainfall: 1218 mm ATO: 1503 day °C	Calcareous slate, grit
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY	FC Days: 237 Climatic Grade: 2 Exposure Grade: -	SOIL SAMPLE REFERENCES
14.96	19.4.96	SW 9192 5401	PB		PB 359

Horizon No.	Lowest Av. Depth (cm)	Texture	Matrix (Ped Face) Colours	Stoniness: Size,Type, and Field Method	Mottling Abundance, Contrast, Size and Colour	Mangan Concs	Structure: Ped Development Size and Shape	Consistence	Structural Condition	Pores (Fissures)	Roots: Abundance and Size	Calcium Carbonate Content	Horizon Boundary: Distinctness and form
1	25	HCL/ MCL	10YR43	2% > 2 cm 6% < 2 cm 8% HR (S + D)	0	0	MCSAB	Fr	M	G	MF,VF	-	Clear smooth
2	32	HCL	10YR43	8% HR (S + D)	FDFO 75YR58	0	WCSAB	Fr	M	G	MF,VF	-	Clear smooth
3	50	ZC	7.5YR56	6% > 2 cm 19% < 2 cm 25% HR, ZR (S + D)	CDMO,G 75YR58 10YR74	F	WCSAB	Fr	M	G	CVF	-	Grad wavy
4	100+	ZC	7.5YR64	30% > 2 cm 14% < 2 cm 44% HR, ZR (S + D)	*	0	WAdCSAB	Fm	P	(G)	FVF	-	-

Profile Gleyed From: 32

Depth to Slowly Permeable Horizon: -

Wetness Class: III (Borderline I)

Wetness Grade: 3b (Borderline 3a)

Available Water Wheat: 102 mm

Potatoes: 87 mm

Moisture Deficit Wheat: 79 mm

Potatoes: 65 mm

Moisture Balance Wheat: +23 mm

Potatoes: +22 mm

Droughtiness Grade: 2 (Calculated to 120 cm)

Final ALC Grade: 3b

Main Limiting Factor(s): We

Remarks: * H4 lenses of 10YR74 with CDFOM (7.5YR58) therefore gleyed in part but not overall.

H1 PSD shows 27% of clay; ie. Borderline HCL/MCL. Taken as MCL on basis on hand texturing characteristics and observed ease of working in seedbed preparation at the time of survey.