Wadebridge

Agricultural Land Classification

September 1997

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Bristol
FRCA Western Region

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WADEBRIDGE

AGRICULTURAL LAND CLASSIFICATION SURVEY

CONTENTS

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INTRODUCTION

1. This report presents the findings of a semi-detailed Agricultural Land Classification (ALC) survey of 175.1 ha of land at Wadebridge, Cornwall. Field survey was based on 79 auger borings and 5 soil profile pits, and was completed in September 1997. During the survey 5 samples were analysed for particle size distribution (PSD).

2. The survey was conducted by the Resource Planning Team of FRCA Western Region on behalf of MAFF in its statutory role in the preparation of North Cornwall Local Plan.

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 1982 at a scale of 1: 25 000 (ADAS, 1982). This shows mainly Subgrade 3a with a small area of Grade 2 to the east of Treneague. However, the current survey uses the Revised Guidelines and Criteria for grading the quality of agricultural land (MAFF, 1988) and therefore supersedes any previous ALC survey. Grade descriptions are summarised in Appendix I.

4. An adjacent survey at West Wadebridge (ADAS 1994) shows Subgrade 3a limited mainly by workability and other recent surveys around Wadebridge (ADAS 1994 and 1996) also show mainly Subgrade 3a.

5. At the time of survey land cover was mainly grass with some cereals and one field of maize for silage. Other land which was not surveyed included mainly woodland, residential land, roads, a section of disused railway, a playing field and the River Camel.

SUMMARY

6. The distribution of ALC grades is shown on the accompanying 1: 15 000 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 the Table 1.

Table 1: Distribution of ALC grades: Wadebridge

Grade	Area (ha)	% Surveyed Area (137.2 ha)
3a	95.4	69
3b	12.2	9
4	24.6	18
5	5.0	4
Other land	37.9	
Total site area		

7. This shows that 69% of area was found to be best and most versatile. This was Subgrade 3a limited mainly by workability and also by droughtiness in parts. Apart from a larger area of Grade 4 in the flood plain of the River Camel, which is limited by wetness, other smaller areas of Subgrade 3b and Grade 4 on the steeper valley sides are limited by gradient.

CLIMATE

8. 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.

9. 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 no overall climatic limitation.

10. Climatic variables also affect ALC grade through interactions with soil conditions. The most important interactive variables are Field Capacity Days (FCD) 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: Wadebridge

Grid Reference		SW 996 717	SW 980 721
Altitude (m)		25	85
Accumulated Temperature (day °C)		1602	1534
Average Annual Rainfall (mm)		1021	1077
Overall Climatic Grade		1	1
Field Capacity Days		203	211
Moisture deficit (mm):	Wheat	93	84
	Potatoes	83	71

11. The highest land at the west of the site was considered to exhibit a minor limitation due to exposure, as indicated by tree growth, although this is likely to be no more more than to Grade 2 and is nowhere the primary limitation.

RELIEF

12. Altitude ranges from 5 metres along the River Camel to 89 metres above Dunveth Farm with mainly gentle and moderate slopes which are not limiting although steeper slopes are found on smaller areas of the valley sides limiting this land to Subgrade 3b or Grade 4.

13. Most land in the flood plain of the River Camel is protected by an effective embankment. The narrow strip of land outside this embankment floods regularly with the tide and is limited to occasional rough grazing. Land within the embankment is reported to have flooded only once in a lifetime and then only for less than 24 hours. On this basis any flood risk within the flood bank is not considered to be limiting.

GEOLOGY AND SOILS

14. The underlying geology of the site is shown on the published geology map (IGS, 1976) as Devonian Grey slates with alluvium in the flood plains of the major rivers. This was entirely borne out by the recent ALC survey.

15. Soils were mapped by the Soil Survey of England and Wales at a reconnaissance scale of 1:250 000 (SSEW, 1983) as mainly Powys association on the higher ground with Conway Association in the flood plain of the River Camel. Powys association is described as shallow well drained loamy soils over rock, whereas Conway association is described as deep stoneless fine silty and clayey soils variably affected by groundwater which are found on flat land with a risk of flooding. This is entirely borne out by the recent ALC survey.

AGRICULTURAL LAND CLASSIFICATION

16. The distribution of ALC grades found by the current survey is shown on the accompanying 1: 15 000 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

17. Subgrade 3a comprises by far the major part of the gently sloping land within the survey area. This was found to be mainly heavy clay loam topsoil at Wetness Class I, indicating a primary limitation due to restricted workability. Pits 1 to 4 were all sited to investigate profiles which had proved to be impenetrable to the auger. At each pit the stone content of each horizon was assessed by sieving and the available water for the profile was calcualted to a depth of 80 or 90 cm. This was considered reasonable in view of the evidence of rooting through the profiles. This showed that each profile was within limits of mositure balance for droughtiness appropriate to Subgrade 3a.

Subgrade 3b

18. Small areas of Subgrade 3b found on the more steeply sloping valley sides are limited by gradient.

Grade 4

19. The main area of Grade 4 is shown in the flood plain of the River Camel. Topsoil textures were found to be heavy silty clay loam or silty clay and Wetness Class was assessed as mainly IV with some III. A slowly permeable layer was evident in most borings. This is illustrated by Pit 5 which found the slowly permeable layer to be sporadic between 16 and 90 cm depth. In this instance Horizon 3 from 40 - 60 cm was found to be reltively porous and therefore not slowly permeable within the terms of the ALC definition. However, the profile overall was assessed as Wetness Class IV in view of the sporadic SPL and any aggravation to wetness caused by groundwater.

Grade 5

20. The small area of Grade 5 is shown outside the flood embankment of the River Camel where there is evidence of fairly regular flooding at high tide, limiting the effective use of the land to rough grazing.

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FRCA Bristol
30 September 1997

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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 (Ed) (1997) Soil Survey Field Handbook. Soil Survey Technical Monograph No 5, SSLRC, Cranfield.

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, 1997).

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.

AP (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
MSST:	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	**WA:**	Weakly developed Adherent	**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%			

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, 1997) for details.

SITE NAME	PROFILE NO.	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
Wadebridge	Pit 1 (Asp 86)	4 °W	PGR	Av Rainfall: 1050 mm ATO: 1550 day °C	Devonian Grey Slate
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY	FC Days: 207 Climatic Grade: 1 Exposure Grade: 1	PSD SAMPLES TAKEN
42.97	8.9.97	SW 9962 7143	PB		130-25- HCL/MCL (S39:Z34 : C27%)

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	23	HCL	10YR43	1%> 2 cm (s) 22%< 2cm (s +d) 23% HR	0	0	-	-	-	G	MF, VF	-	Clear Smooth
2	33	HCL	7.5YR43	1% >2cm (s) 23% < 2 cm (s +d) 24% HR	0	0	MDMGR	FR	G	G	MF, VF	-	Abrupt Wavy
3	68	HCL	10YR54	40% >2 cm (s) 29%< 2 cm (s +d) 74% HR, ZR	CDFO * 10YR58	F(in stones)	Too stony	-	(M)	(G)	FVF(CVF in soil matrix)	-	-

Profile Gleyed From: - *

Slowly Permeable Horizon From: -

Wetness Class: I

Wetness Grade: 3a

Available Water Wheat: 85 mm

Potatoes: 86 mm

Moisture Deficit Wheat: 89 mm

Potatoes: 77 mm

Moisture Balance Wheat: -4 mm

Potatoes: -9 mm

Droughtiness Grade: 3a (Calculated to 80 cm)

Final ALC Grade: 3a

Main Limiting Factor(s): WK, DR

Remarks: H3 mottles mainly associated with weathering stones, therefore horizon not gleyed although rock within H3 may be.

SITE NAME	PROFILE NO.	SLOPE AND ASPECT	LAND USE			PARENT MATERIAL
Wadebridge	Pit 2 (Nr Asp 16)	3 ° NE	PGR	Av Rainfall:	1070 mm	Devonian Grey Slate
				ATO:	1540 day °C	
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY	FC Days:	210	PSD SAMPLES TAKEN
42.97	11.9.97	SW 98177231	PB	Climatic Grade:	1	TS 0-25 cm HCL (S42:Z27 : C31%)
				Exposure Grade:	2	

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	23	HCL	10YR43	1%> 2 cm (s) 22%< 2cm (s +d) 23% HR	0	0	-	-	-	G	AF, VF	-	Clear Smooth
2	35.5	HCL	7.5YR43	30%> 2 cm (s) 24% < 2 cm (s +d) 54% ZR	0	0	MDMGR	FR	G	G	MVF	-	Grad Wavy
3	80+	HCL	10YR54	50% .>2 cm (s) 29%< 2 cm (s +d) 79% ZR	CDFO * 10YR58	0	Too stony	8-	(M)	(G)	FVF	-	-

Profile Gleyed From: -

Slowly Permeable Horizon From: -

Wetness Class: I

Wetness Grade: 3a

Available Water	Wheat:	90 mm
	Potatoes:	85 mm
Moisture Deficit	Wheat:	89 mm
	Potatoes:	77 mm
Moisture Balance	Wheat:	+1 mm
	Potatoes:	+8 mm

Droughtiness Grade: 3a (Calculated to 90 cm)

Final ALC Grade: 3a

Main Limiting Factor(s): WK, DR

Remarks:

SITE NAME	PROFILE NO.	SLOPE AND ASPECT	LAND USE			PARENT MATERIAL
Wadebridge	Pit 3 (Asp 28)	0 °	PGR	Av Rainfall:	1050 mm	Devonian Grey Slate
				ATO:	1550 day °C	
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY	FC Days:	207	PSD SAMPLES TAKEN
42.97	11.9.97	SW 98237196	PB	Climatic Grade:	1	TS 0.25 cm HCL (S38:Z30 : C 32%)
				Exposure Grade:	2	

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	23	HCL	10YR43	1%> 2 cm (s) 18%< 2cm (s +d) 19% HR	0	0	-	-	-	G	AF, VF	-	Clear Smooth
2	30	HCL	7.5YR43	4%> 2 cm (s) 28% < 2 cm (s +d) 32% ZR	0	0	MDMGR	FR	G	G	MF,VF	-	Grad Smooth
3	60	HCL	10YR54	55% .>2 cm (s) 24%< 2 cm (s +d) 79% ZR	0	F*	Too stony	-	(M)	(G)	CVF	-	Abrupt Irregular
4	>60	Slate											-

Profile Gleyed From: -

Slowly Permeable Horizon From: -

Wetness Class: I (assumed)

Wetness Grade: 3a

Available Water	Wheat:	81 mm
	Potatoes:	83 mm
Moisture Deficit	Wheat:	89 mm
	Potatoes:	77 mm
Moisture Balance	Wheat:	-8 mm
	Potatoes:	-6 mm

Droughtiness Grade: 3a (Calculated to 80 cm)

Final ALC Grade: 3a

Main Limiting Factor(s): WK, DR

Remarks: * some ochreous staining and manganese deposit associated with weatheirng slate.

Wetness Class I assumed as profile examined only 60 cm.

SITE NAME	PROFILE NO.	SLOPE AND ASPECT	LAND USE			PARENT MATERIAL
Wadebridge	Pit 4 (Nr Asp 8)	0 °	Ley	Av Rainfall:	1077 mm	Devonian Grey Slate
				ATO:	1534 day °C	
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY	FC Days:	211	PSD SAMPLES TAKEN
42.97	23.9.97	SW 9764 7232	PB	Climatic Grade:	1	TS 0-25 cm HCL (C) (S37:Z29 : C 34%)
				Exposure Grade:	2	

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	7.5YR43	2%> 2 cm (s) 27%< 2cm (s +d) 29% HR	0	0	-	-	-	-	AF, VF	-	Clear Wavy
2	43	HZCL	10YR43	15%> 2 cm (s) 45% < 2 cm (s +d) 60% ZR	0	0	MDMGR	FR	G	G	MVF	-	Grad Smooth
3	58	HCL	10YR54	45% .>2 cm (s) 29%< 2 cm (s +d) 74% ZR	0	0	Too stony	FR	(M)	G	CVF	-	Grad Wavy
4	70+	Slate (HZCL)	10YR63	95% ZR (VIS)	0	0	-		(M)	(G)	FVF		

Profile Gleyed From: -

Slowly Permeable Horizon From: -

Wetness Class: I

Wetness Grade: 3a

Available Water	Wheat:	73 mm
	Potatoes:	75 mm
Moisture Deficit	Wheat:	89 mm
	Potatoes:	77 mm
Moisture Balance	Wheat:	-16 mm
	Potatoes:	-2 mm

Droughtiness Grade: 3a (Calculated to 80 cm)

Final ALC Grade: 3a

Main Limiting Factor(s): WK, DR

Remarks:

SITE NAME	PROFILE NO.	SLOPE AND ASPECT	LAND USE			PARENT MATERIAL
Wadebridge	Pit 5 (Asp 41)	0 °	PGR	Av Rainfall:	1020 mm	Alluvium
				ATO:	1602 day °C	
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY	FC Days:	203	PSD SAMPLES TAKEN
42.97	23.9.97	SW 99777184	PB	Climatic Grade:	1	TS 0-25 cm HZCL (S9:Z61 : C 30%)
				Exposure Grade:	1	

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	16	HZCL	2.5Y61	0	MDMO 10YR58	-	-	-	-	G	MF, VF	-	Clear Smooth
2	40	C	2.5Y61	0	MDMO 10YR58	C	MDCPR	FM	P	P(Low)	CVF	-	Grad Smooth
3	60	ZC	2.5Y61	0	MFMO 10YR58	F	STVCPR	FM	P	G (low)	FVF	-	Grad Smooth
4	90+	ZC	2.5Y62	0	CDFO 10YR58	O	MDVCPR	FM	P	P(low)	FVF		

Profile Gleyed From: 0 cm

Slowly Permeable Horizon From: 16-40 cm and from 60 cm

Wetness Class: IV*

Wetness Grade: 4

Available Water Wheat: 123 mm

Potatoes: 98 mm

Moisture Deficit Wheat: 89 mm

Potatoes: 77 mm

Moisture Balance Wheat: +34 mm

Potatoes: 21 mm

Droughtiness Grade: 3a (Calculated to 120 cm)

Final ALC Grade: 4

Main Limiting Factor(s): We

Remarks: WC III on gley characteristics alone; but assessed as WCIV in view of sporadic SPL aggravated by ground water wetness. Field shows dense relict drainage gutters.