# Upper Cam

## Agricultural Land Classification

## May 1998

Resource Planning Team
Bristol
FRCA Western Region

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# UPPER CAM

# AGRICULTURAL LAND CLASSIFICATION SURVEY

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## INTRODUCTION

1 This report presents the findings of a semi detailed Agricultural Land Classification (ALC) survey of 216 9 ha of land at Upper Cam Gloucestershire The site runs from Drake Lane Dursley to the sewage works off Box Road Cam Field survey was based on 94 auger borings and 8 soil profile pits and was completed in March 1998 During the survey 5 soil 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 the Stroud District 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 being Grade 3 with an area of Grade 2 to the north of Box Road the site had not been surveyed previously However the current survey uses the Revised Guidelines and Criteria for grading the quality of agricultural land (MAFF 1988) and supersedes any previous ALC survey Grade descriptions are summarised in Appendix I

4 Previously land running along the line of the disused railway between Box Road and Upthorne was surveyed in 1997 (FRCA, 1997) This was shown to be mostly Subgrade 3b with some Subgrade 3a due to moderate wetness limitations A small area of Grade 2 land with minor workability and drought limitations was mapped adjacent to Box Road on a gravel deposit

5 At the time of survey land cover was all permanent grassland for grazing except for a couple of fields of winter wheat on the higher ground at Cam Green and on Halmore Lane Land that was not surveyed includes residential areas agricultural farmsteads and an area of newly established woodland below Peaked Down

## SUMMARY

6 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 the Table 1

7 Table 1 shows that only 24% of the agricultural land surveyed has been mapped as best and most versatile with 22% being Subgrade 3a The Grade 2 land has minor workability and drought limitations which are a continuation of a mapping unit from the adjacent survey Most of the site has a moderate wetness limitation with the distinction between Subgrades 3a and 3b being topsoil texture and whether or not the upper subsoil is a slowly permeable layer Strongly and steeply sloping land has been mapped to the south of Springhill as Subgrade 3b

and Grade 4 with moderate and severe limitations due to gradient The two Grade 4 mapping units below Peaked Down and near Dulkin Brook have severe drought and wetness limitations respectively

**Table 1 Distribution of ALC grades Upper Cam**

| Grade | Area (ha) | % Surveyed Area (186 8 ha) |
|---|---|---|
| 2 | 3 2 | 2 |
| 3a | 42 3 | 22 |
| 3b | 104 6 | 56 |
| 4 | 36 7 | 20 |
| Other land | 30 1 | |
| Total site area | 216 9 | |

## 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 Upper Cam**

| Grid Reference | | SO 754 020 | SO 758 007 | SO 766 994 |
|---|---|---|---|---|
| Altitude (m) | | 26 | 75 | 115 |
| Accumulated Temperature (day C) | | 1503 | 1448 | 1403 |
| Average Annual Rainfall (mm) | | 802 | 931 | 844 |
| Overall Climatic Grade | | 1 | 1 | 1 |
| Field Capacity Days | | 177 | 182 | 185 |
| Moisture deficit (mm) | Wheat | 100 | 93 | 88 |
| | Potatoes | 92 | 83 | 76 |

## RELIEF

11 Altitude ranges from 26 metres on Box Road to 125 metres below Peaked Down Most of the land is either level gently sloping or moderately sloping giving no agricultural limitation Several fields in the middle part of the site are close to the 7 cut off for Subgrade 3b but this would not be the overall limitation in these areas To the south of Springhill the land becomes strongly and steeply sloping and is limited to Subgrade 3b and Grade 4 due to gradient

## GEOLOGY AND SOILS

12 The underlying geology of the site is shown on the published geology maps (IGS 1970 1975) this being a complex pattern of Jurassic clay and rock and more recent drift material Bands of Lower Lias clay and Middle Lias Dyrham Silts are mapped over much of the site with the clay becoming more dominant on the lower ground Deposits of river terrace gravels and estuarine alluvium are mapped with the clay to the north of Draycott Farm while outcrops of Middle Lias Marlstone Rock Beds are shown below Peaked Down Although the distribution of the clay and silts was variable as indicated by the soils in general the published geology was borne out by the current survey

13 Soils were mapped by the Soil Survey of England and Wales at a reconnaissance scale of 1 250 000 (SSEW 1983) This shows soils from the Martock and Oxpasture Associations over the clay lias and Marlstone geology with an area of Bardsey 1 soils on the northern edge of the site

14 Martock soils are described as being slowly permeable seasonally waterlogged stoneless silty over clayey or clayey soils over siltstone or shale with similar soils having slowly permeable subsoils and slight waterlogging Oxpasture soils are also slowly permeable being described as fine loamy over clayey and clayey soils with slowly permeable subsoils and slight seasonal waterlogging and some slowly permeable seasonally waterlogged soils The river gravels in the northern part of the site have developed the Badsey 1 soils which are described as being well drained calcareous and non calcareous fine loamy soils over limestone gravel Some deep fine loamy soils and fine loamy soils over gravel and similar but shallower soils affected by groundwater may also be found

15 The general distribution of the soils was largely borne out by the current survey although it was difficult to distinguish between the Martock and Oxpasture soils and shallow well drained profiles were found on the Marlstone outcrops which were not described by the published soils map

## AGRICULTURAL LAND CLASSIFICATION

16 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

**Grade 2**

17 Soils developed over the river gravels to the south of Box Road are mapped as Grade 2 with minor workability and drought limitations The profiles mainly have medium clay loam topsoils over heavy clay loam subsoils which with no evidence of wetness were assessed as Wetness Class I (see Appendix II) Pit 1 from the adjacent 1997 survey (FRCA, 1997) illustrates this mapping unit and shows that although 31% and 62% hard rock by volume was found in the upper and lower subsoils respectively there is only a minor drought limitation Pit 4 from the current survey also shows similar subsoils

**Subgrade 3a**

18 The areas of Subgrade 3a land around Upthorpe and Ashmead Green have a moderate wetness limitation The profiles developed over bands of Dyrham Silts tend to have medium and heavy clay loam and silty clay loam toposils which with the profiles being assessed as Wetness Classes II and III impart a moderate wetness limitation Pits 2 5 and 7 is an example of these units showing that the clay and silty clay lower subsoils are gleyed with slowly permeable layers starting The mapping unit below Upper Upthorpe Farm is a continuation of the Subgrade 3a land mapped during the adjacent survey (FRCA 1977)

**Subgrade 3b**

19 The Subgrade 3b land throughout the site has a moderate wetness limitation The profiles tend to have medium clay loam and silty loam topsoils over clay subsoils With gleying being present below the topsoil and slowly permeable layers starting below 35 cm to 40 cm they were assessed as Wetness Class IV which together with the topsoil texture implies the moderate wetness limitation Within this mapping unit there are also isolated areas of Subgrade 3a and Grade 4 land which could not be mapped at this level of detail

20 Most of this mapping unit to the south of Springhill has strongly sloping gradients that impart a moderate limitation to its agricultural use due to gradient

**Grade 4**

21 The northern Grade 4 mapping unit near Dulkin Brook consists of clayey profiles that are gleyed from the surface or below the topsoil with slowly permeable layers starting below the topsoil They were assessed as Wetness Class IV which with the clay topsoil imparts a severe wetness limitation Pits 3 and 6 illustrate this mapping unit

22 The Grade 4 land below Peaked Down is developed over Marlstone Rock leading to shallow profiles In Pit 8 31% hard rock was found at 18 cm and 80% hard rock was found at 40 cm which gives a severe drought limitation These profiles also have a moderate limitation due to soil depth and the high stone content of their top 25 cm

23 The Grade 4 land near Dursley is moderately steeply and steeply sloping which imparts a severe limitation due to gradient

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May 1998

## REFERENCES

FRCA Resource Planning Team (1997) Agricultural Land Classification Survey of North East Cam Scale 1 10 000 Reference 66/97 FRCA Bristol

HODGSON J M (Ed) (1974) Soil Survey Field Handbook Soil Survey Technical Monograph No 5 SSLRC Cranfield University

INSTITUTE OF GEOLOGICAL SCIENCES (1970) Sheet 251 Malmesbury 1 63 360 series Solid and Drift edition IGS London

INSTITUTE OF GEOLOGICAL SCIENCES (1975) Sheet 234 Gloucester 1 50 000 series Solid and Drift edition IGS London

MAFF (1977) 1 250 000 series Agricultural Land Classification South West Region MAFF Publications Alnwick

MAFF (1988) Agricultural Land Classification of England and Wales Revised Guidelines and Criteria for grading the quality of agricultural land MAFF Publications Alnwick

METEOROLOGICAL OFFICE (1989) Climatological Data for Agricultural Land Classification Meteorological Office Bracknell

SOIL SURVEY OF ENGLAND AND WALES (1983) Sheet 5 Soils of South West England 1 250 000 scale SSEW Harpenden

SOIL SURVEY OF ENGLAND AND WALES (1984) Soils and Their Use in South West England Bulletin No 14 SSEW Harpenden

## 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 (e g 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

**USE** 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 | | |

**ASPECT** The aspect of the land

**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

| | | | | | |
|---|---|---|---|---|---|
| **M REL** | 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 | | | | |

| | | | | | |
|---|---|---|---|---|---|
| **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 / | | | |

**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 and 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** | **WK** | Weakly developed | **MD** | Moderately developed |
| | **ST** | Strongly developed | | |

**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 |
|---|---|---|---|---|---|
| Upper Cam | Pit 1 (Asp 75) | 3 North | Permanent Grass | Av Rainfall 831 mm<br>ATO 1448 day C<br>FC Days 182<br>Climatic Grade 1<br>Exposure Grade 1 | Dyrham Silts |
| JOB NO | DATE | GRID REFERENCE | DESCRIBED BY | | SOIL SAMPLE REFERENCES |
| 88/97 | 21/1/98 | ST 7660 9965 | HLJ PRW | | T/S 0 25 cm HZCL (S12 Z56 C32) |

| 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 | 24 | HZCL | 10YR43 | 0 / (Vis) | FFFO (10YR58) | None | | | | Good | CF & VF | | Clear Smooth |
| 2 | 42 | HCL | 10YR42 | 0 / (Vis) | CDMO (10YR58) | None | MDMSAB | Friable | Moderate | Poor*[1] | CF & VF | | Abrupt Wavy |
| 3 | 80 + | C | 2 5Y61 | 0 / (Vis) | CDMO (10YR58) | Common | WKCSAB* | Friable | Moderate | Poor | FF & VF | | |

Profile Gleyed From 24 cm

Depth to Slowly Permeable Horizon 42 cm

Wetness Class IV

Wetness Grade 4

| | | |
|---|---|---|
| Available Water | Wheat | 143 mm |
| | Potatoes | 119 mm |
| Moisture Deficit | Wheat | 93 mm |
| | Potatoes | 83 mm |
| Moisture Balance | Wheat | 50 mm |
| | Potatoes | 36 mm |
| Droughtiness Grade | 1 | (Calculated to 120 cm) |

Final ALC Grade 4

Main Limiting Factor(s) Wetness

Remarks *[1] within the peds
*[2] tending to WKCPR
Water entering from the pit floor
Material at the bottom of the pit is less weathered

| SITE NAME | PROFILE NO | SLOPE AND ASPECT | LAND USE | | | PARENT MATERIAL |
|---|---|---|---|---|---|---|
| Upper Cam | Pit 2 (Asp 73) | 6 North | Permanent Grass | Av Rainfall | 831 mm | Dyrham Silts |
| | | | | ATO | 1448 day C | |
| JOB NO | DATE | GRID REFERENCE | DESCRIBED BY | FC Days | 182 | SOIL SAMPLE REFERENCES |
| 88/97 | 21/1/98 | ST 7632 9964 | HLJ PRW | Climatic Grade | 1 | None |
| | | | | 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 | 22 | MCL | 10YR43 | 0 / (Vis) | None | None | | | | Good | MF & VF | | Clear Smooth |
| 2 | 44 | MCL | 10YR54 56 | 1 / HR (Vis) | None | None | WKCSAB*[1] | Friable | Moderate | Good | MF & VF | | Abrupt Smooth |
| 3 | 80 + | C | 10YR53 54 | 1 / HR (Vis) | CDFO (10YR58) | None | MDCSAB*[2] | Friable | Moderate | Poor | CF & VF | | |

| | |
|---|---|
| Profile Gleyed From | 44 cm |
| Depth to Slowly Permeable Horizon | No spl |
| Wetness Class | II |
| Wetness Grade | 3a |

| | | |
|---|---|---|
| Available Water | Wheat | 139 mm |
| | Potatoes | 116 mm |
| Moisture Deficit | Wheat | 93 mm |
| | Potatoes | 83 mm |
| Moisture Balance | Wheat | 46 mm |
| | Potatoes | 33 mm |
| Droughtiness Grade | 1 | (Calculated to 120 cm) |

| | |
|---|---|
| Final ALC Grade | 3a |
| Main Limiting Factor(s) | Wetness |

Remarks *[1] prismatic tendencies
* angular tendencies

| SITE NAME | PROFILE NO | SLOPE AND ASPECT | LAND USE | | PARENT MATERIAL |
|---|---|---|---|---|---|
| Upper Cam | Pit 3 (Asp 60) | 3 South West | Permanent Grass | Av Rainfall 831 mm<br>ATO 1448 day C<br>FC Days 182<br>Climatic Grade 1<br>Exposure Grade 1 | Lower Lias Clay |
| JOB NO | DATE | GRID REFERENCE | DESCRIBED BY | | SOIL SAMPLE REFERENCES |
| 88/97 | 3/2/98 | ST 7561 9977 | HLJ | | T/S 0 25 cm HZCL (S10 Z61 C29) |

| 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 | 27 | HZCL | 10YR42 | 1 / HR (Vis) | FDFO (7 5YR56) | None | | | | | MF & VF | | Clear Smooth |
| 2 | 60 | C | 25Y64 | 0 / (Vis) | CDMO (7 5YR66) CDFG (10Y61) | Few | WKCPR | Firm | Poor | Poor | FVF | | Abrupt Smooth |
| 3 | 100 + | ZC | 5GY61 | 5 / ZR (Vis) | MDMO (7 5YR58) | Common | WKVCPR | Firm | Poor | Poor | FVF | | |

| | |
|---|---|
| Profile Gleyed From | 27 cm |
| Depth to Slowly Permeable Horizon | 27 cm |
| Wetness Class | IV |
| Wetness Grade | 4 |

| | | |
|---|---|---|
| Available Water | Wheat | 129 mm |
| | Potatoes | 106 mm |
| Moisture Deficit | Wheat | 93 mm |
| | Potatoes | 83 mm |
| Moisture Balance | Wheat | 36 mm |
| | Potatoes | 23 mm |
| Droughtiness Grade | 1 | (Calculated to 120 cm) |

| | |
|---|---|
| Final ALC Grade | 4 |
| Main Limiting Factor(s) | Wetness |

Remarks

| SITE NAME | PROFILE NO | SLOPE AND ASPECT | LAND USE | | PARENT MATERIAL |
|---|---|---|---|---|---|
| Upper Cam | Pit 4 (Asp 4) | Level | Permanent Grass | Av Rainfall 831 mm<br>ATO 1448 day C<br>FC Days 182<br>Climatic Grade 1<br>Exposure Grade 1 | River Gravels |
| JOB NO | DATE | GRID REFERENCE | DESCRIBED BY | | SOIL SAMPLE REFERENCES |
| 88/97 | 4/2/98 | SO 7530 0189 | HLJ | | T/S 0 25 cm ZC (S16 Z48 C36) |

| 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 | 21 | ZC | 10YR43 | 1 / HR (Vis) | None | None | | | | | MF & VF | | Abrupt Smooth |
| 2 | 48 | ZC | 10YR64 | 3 / >2cm (s)<br>25 / <2cm (s&d)<br>28 / HR Total | None | None | MDMSAB | Friable | Good | Good | CF & VF | | Clear Smooth |
| 3 | 110 + | ZC | 2 5Y54 | 4 / >2cm (s)<br>65 / <2cm (s&d)<br>69 / HR Total | None | None | WKMSAB | Friable | Good | Good | FVF | | |

Profile Gleyed From Not gleyed

Depth to Slowly Permeable Horizon No spl

Wetness Class I

Wetness Grade 3b

| | | |
|---|---|---|
| Available Water | Wheat | 113 mm |
| | Potatoes | 93 mm |
| Moisture Deficit | Wheat | 93 mm |
| | Potatoes | 83 mm |
| Moisture Balance | Wheat | 20 mm |
| | Potatoes | 10 mm |

Droughtiness Grade 2 (Calculated to 120 cm)

Final ALC Grade 3b

Main Limiting Factor(s) Workability

Remarks

| SITE NAME | PROFILE NO | SLOPE AND ASPECT | LAND USE | | PARENT MATERIAL |
|---|---|---|---|---|---|
| Upper Cam | Pit 5 (Asp 37) | Level | Permanent Grass | Av Rainfall 831 mm<br>ATO 1448 day C | Dyrham Silts |
| JOB NO | DATE | GRID REFERENCE | DESCRIBED BY | FC Days 182<br>Climatic Grade 1<br>Exposure Grade 1 | SOIL SAMPLE REFERENCES |
| 88/97 | 4/2/98 | SO 7603 0035 | HLJ | | T/S 0 25 cm MZCL (S8 Z67 C25) |

| 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 | 24 | MZCL | 10YR43 | 1 / HR (Vis) | None | None | | | | | MF & VF | | Clear Smooth |
| 2 | 46 | HZCL | 10YR54 | 0 / (Vis) | FDFO (10YR56) | None | MDCSAB | Friable | Moderate | Good | CF & VF | | Clear Smooth |
| 3 | 65 | ZC | 10YR53 | 0 / (Vis) | CDMO (7 5YR58 10YR66) | Common | WKCSAB | Friable | Moderate | Poor*[1] | FVF | | Clear Smooth |
| 4 | 90 + | C | 2 5Y51 | 0 / (Vis) | MDMO (10YR68) | None | MDCPR | Firm | Poor | Poor | FVF | | |

Profile Gleyed From 46 cm

Depth to Slowly Permeable Horizon 46 cm

Wetness Class III

Wetness Grade 3a

| | | |
|---|---|---|
| Available Water | Wheat | 139 mm |
| | Potatoes | 118 mm |
| Moisture Deficit | Wheat | 93 mm |
| | Potatoes | 83 mm |
| Moisture Balance | Wheat | 46 mm |
| | Potatoes | 35 mm |

Droughtiness Grade 1 (Calculated to 120 cm)

Final ALC Grade 3a

Main Limiting Factor(s) Wetness

Remarks *[1] borderline

| SITE NAME | PROFILE NO | SLOPE AND ASPECT | LAND USE | | PARENT MATERIAL |
|---|---|---|---|---|---|
| Upper Cam | Pit 6 (Asp 55) | 3 South | Permanent Grass | Av Rainfall 831 mm<br>ATO 1448 day C<br>FC Days 182<br>Climatic Grade 1<br>Exposure Grade 1 | Lower Lias Clay |
| JOB NO | DATE | GRID REFERENCE | DESCRIBED BY | | SOIL SAMPLE REFERENCES |
| 88/97 | 11/2/98 | ST 7603 9994 | HLJ | | T/S 0 25 cm HZCL (S10 Z61 C29) |

| 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 | 22 | HZCL | 10YR42 | 1 / HR (Vis) | None | None | | | | | MF & VF | | Abrupt Smooth |
| 2 | 45 | ZC | 10YR53 | 0 / (Vis) | CDFO (10YR66) | None | WKCAB | Firm | Poor | Poor | CVF | | Clear Smooth |
| 3 | 85 + | C | 2 5Y52 | 0 / (Vis) | MDFO (7 5YR58) | Few | MDCPR | Firm | Poor | Poor | FVF*[1] | | |

| | |
|---|---|
| Profile Gleyed From | 22 cm |
| Depth to Slowly Permeable Horizon | 22 cm |
| Wetness Class | IV |
| Wetness Grade | 4 |

| | | |
|---|---|---|
| Available Water | Wheat | 125 mm |
| | Potatoes | 102 mm |
| Moisture Deficit | Wheat | 93 mm |
| | Potatoes | 83 mm |
| Moisture Balance | Wheat | 32 mm |
| | Potatoes | 19 mm |
| Droughtiness Grade | 1 | (Calculated to 120 cm) |

| | |
|---|---|
| Final ALC Grade | 4 |
| Main Limiting Factor(s) | Wetness |

Remarks *[1] ex ped

| SITE NAME | PROFILE NO | SLOPE AND ASPECT | LAND USE | | PARENT MATERIAL |
|---|---|---|---|---|---|
| Upper Cam | Pit 7 (Asp 39) | 1 West | Permanent Grass | Av Rainfall 831 mm<br>ATO 1448 day C | Dyrham Silts |
| JOB NO | DATE | GRID REFERENCE | DESCRIBED BY | FC Days 182<br>Climatic Grade 1<br>Exposure Grade 1 | SOIL SAMPLE REFERENCES |
| 88/97 | 13/2/98 | SO 7560 0022 | HLJ | | None |

| 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 | 27 | MZCL | 10YR54 | 1 / HR (Vis) | FDFO (10YR56) CDFG (2 5Y52) | None | | | | | MF & VF | | Clear Smooth |
| 2 | 55 | HZCL | 10YR53 54 | 0 / (Vis) | CDFO (10YR56) | None | WKCSAB | Friable | Moderate | Good | CVF | | Clear Wavy |
| 3 | 90 + | ZC | 2 5Y64 | 0 / (Vis) | MDFO (10YR68) CDFG (10YR52) | Common | WKCPR | Firm | Poor | Poor | FVF | | |

Profile Gleyed From 27 cm

Depth to Slowly Permeable Horizon 55 cm

Wetness Class III

Wetness Grade 3a

| | | |
|---|---|---|
| Available Water | Wheat | 140 mm |
| | Potatoes | 116 mm |
| Moisture Deficit | Wheat | 93 mm |
| | Potatoes | 83 mm |
| Moisture Balance | Wheat | 47 mm |
| | Potatoes | 33 mm |

Droughtiness Grade 1 (Calculated to 120 cm)

Final ALC Grade 3a

Main Limiting Factor(s) Wetness

Remarks

| SITE NAME | PROFILE NO | SLOPE AND ASPECT | LAND USE | | | PARENT MATERIAL |
|---|---|---|---|---|---|---|
| Upper Cam | Pit 8 (Asp 82E) | Level | Permanent Grass | Av Rainfall | 831 mm | Marlstone Rock Bed |
| | | | | ATO | 1448 day C | |
| JOB NO | DATE | GRID REFERENCE | DESCRIBED BY | FC Days | 182 | SOIL SAMPLE REFERENCES |
| 88/97 | 13/2/98 | ST 7668 9948 | HLJ | Climatic Grade | 1 | None |
| | | | | 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 | 18 | MCL | 10YR43 | 3 / >2cm (s)<br>5 / <2cm (s&d)<br>8 / HR Total | None | None | | | | | MF & VF | | Abrupt Smooth |
| 2 | 40 | HCL | 10YR54 | 15 / >2cm (s)<br>16 / <2cm (s&d)<br>31 / HR Total | None | Few | MDMSAB | Friable | Good | Good | CVF | | Gradual Smooth |
| 3 | 65 + | C | 10YR54 | 65 / >2cm (s)<br>15 / <2cm (s&d)<br>80 / HR Total | None | None | MDFSAB | Friable | Good | Good | FVF | | |

| | |
|---|---|
| Profile Gleyed From | Not gleyed |
| Depth to Slowly Permeable Horizon | No spl |
| Wetness Class | 1 |
| Wetness Grade | 2 |

| | | |
|---|---|---|
| Available Water | Wheat | 68 mm |
| | Potatoes | 66 mm |
| Moisture Deficit | Wheat | 93 mm |
| | Potatoes | 83 mm |
| Moisture Balance | Wheat | 25 mm |
| | Potatoes | 17 mm |
| Droughtiness Grade | 3b | (Calculated to 120 cm) |

| | |
|---|---|
| Final ALC Grade | 4 |
| Main Limiting Factor(s) | Soil Depth |

Remarks