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# Hatt 1997
# Cornwall Structure Plan

## Agricultural Land Classification

## June 1997

Resource Planning Team
Bristol
FRCA Western Region

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# HATT, SALTASH

# 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 404 ha of land at Hatt, near Saltash. Field survey was based on 202 auger borings and 5 soil profile pits, and was completed in April 1997. During the survey 3 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 Cornwall Structure 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 mainly Grade 3 but with considerable areas of Grade 2, 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. The central part of this survey area, immediately around the village of Hatt, was previously surveyed at detailed intensity in 1994 (ADAS, 1994). This survey found mainly Subgrade 3b limited by workability, with small areas of Grade 4 limited mainly by slope. The current survey extends the 1994 survey in all directions.

5. At the time of survey land cover was mainly grass for dairying with some cereals and maize. One field was sown to oilseed rape. Other land which was not surveyed included woodland, roads and buildings and the landfill site at Roodscroft Farm.

## SUMMARY

6. The distribution of ALC grades is shown on the accompanying 1:20 000 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: Hatt**

| Grade | Area (ha) | % Surveyed Area (347.3ha) |
|---|---|---|
| 3b | 267 | 77 |
| 4 | 76 | 22 |
| 5 | 5 | 1 |
| Other land | 56 | |
| Total site area | 404 | |

7. None of the area was found to be best and most versatile. Most was found to be Subgrade 3b, with limited workability due to heavy clay loam topsoil. Areas shown as Grade 4 are limited mainly by gradient in the east of the survey area but by wetness in the west, particularly in the broad valley north of Willaton. Isolated small areas of Grade 5 limited by gradient are found on the short steep slopes of some valley sides.

## 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 an overall climatic limitation which limits much of the land above 35 metres to Grade 2.

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: Hatt**

| Grid Reference | | SX 400 623 | SX 384 617 |
|---|---|---|---|
| Altitude (m) | | 80 | 20 |
| Accumulated Temperature (day °C) | | 1534 | 1603 |
| Average Annual Rainfall (mm) | | 1234 | 1178 |
| Overall Climatic Grade | | 2 | 1 |
| Field Capacity Days | | 240 | 232 |
| Moisture deficit (mm): | Wheat | 77 | 88 |
| | Potatoes | 64 | 78 |

## RELIEF

11. Altitude ranges from 2 metres at Notter Bridge to 82 metres at Bicton Farm with mainly gentle and moderate slopes which are not limiting. However steep slopes do occur, particularly in the east of the area.

## GEOLOGY AND SOILS

12. The underlying geology of the site is shown on the published geology map (IGS, 1977) as mainly Upper Devonian slates with small patches of alluvium and river gravel.

13. Soils were mapped by the Soil Survey of England and Wales at a reconnaissance scale of 1:250 000 (SSEW, 1983) as Denbigh 1 Association. This is described as comprising well drained fine loamy and fine silty soils over rock, with some similar soils which have slowly permeable subsoils. This was entirely borne out by the current survey.

## AGRICULTURAL LAND CLASSIFICATION

14. The distribution of ALC grades found by the current survey is shown on the accompanying 1:20 000 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 3b

15. 77 % of the survey area was found to be Subgrade 3b, predominantly Wetness Class I (see Appendix II) with heavy clay loam topsoil texture. This is related to the climatic data for the site, and with over 225 Field Capacity Days implies a moderate limitation due to restricted workability.

16. Only 3 samples were sent for laboratory particle size distribution analysis. This was considered adequate in the light of previous PSD results at adjacent ALC survey sites, where the 1994 survey at Hatt included 11 samples, 9 of which were heavy clay loam or borderline to it, and 2 were clay. The 1994 survey at Broadmoor Farm included 31 PSD samples, also predominantly heavy clay loam with only 1 medium clay loam. In view of all this evidence, the single PSD at Pit 2 of the current survey which proved to be medium clay loam was considered to be an anomaly, particularly as a second sample of apparently similar material at ASP 27 was found to be heavy clay loam, borderline clay.

17. Although workability was the main limitation to Subgrade 3b, a considerable proportion of the area was also found to be strongly sloping (8-11°). This implies an equivalent limitation due to gradient, and on the database at Appendix III is normally shown as the primary limitation. Investigation of soil characteristics was considered to be not necessary as a higher limitation due to wetness was not found on the stronger slopes.

18. Pits 1, 2 and 5 illustrate conditions typical of this mapping unit. Stone contents for each horizon were measured by the sieving and displacement method, and this information was used in the calculation of available water capacity, but droughtiness was found to be not limiting. Pit 5 was sited to investigate apparent gleying within 40cm as found on the auger survey, but this proved to be erratic, with any ochreous mottling mainly associated with weathering stones.

**Grade 4.**

19. The extensive area of Grade 4 running along the valley north of Villaton was found to be Wetness Class III with gleying within 40cm as at Pit 3, or Wetness Class IV with a slowly permeable layer in the subsoil, as at Pit 4.

20. Other areas shown as Grade 4, mainly in the east of the survey area, are valley sides which are severely limited by gradient, with slopes of 12 to 18°.

**Grade 5**

21. Small areas of steeply sloping valley sides were found to have slopes of 19 to 25° and are shown as Grade 5.

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June 1997

## REFERENCES

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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.

**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:** | Micro relief |

| | | | | | |
|---|---|---|---|---|---|
| **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** | **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 |
|---|---|---|---|---|---|
| Hatt | Pit 1 (Asp 194-195) | 4° NW | PGR | Av Rainfall: 1246 mm<br>ATO: 1515 day °C | Devonian slates |
| JOB NO. | DATE | GRID REFERENCE | DESCRIBED BY | FC Days: 241<br>Climatic Grade: 2<br>Exposure Grade: - | PSD SAMPLES TAKEN |
| 28.97 | 22.4.97 | SX 3880 6104 | P Barnett | | TS 0-25cm: See Asp 186<br>HCL (S38: Z28: C34%) |

| 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 | 31 | HCL | 7.5YR43 | 1%>2cm(S)<br>22%<2cm(S+D)<br>23% ZR | 0 | 0 | - | - | - | - | MF, VF | - | Ab smooth |
| 2 | 52 | C | 10YR54 | 8% >2cm(S)<br>45% <2cm(S+D)<br>53% ZR | 0 | 0 | Too stony | Fr | (M) | (G) | CVF | - | Grad smooth |
| 3 | 80+ | ZC | 2.5Y63 | 15% >2cm (S)<br>40%<2cm (S+D)<br>55% ZR | 0 | F | Too stony | Fr | (M) | (G) | FVF | | |

Profile Gleyed From: -

Depth to Slowly Permeable Horizon: -

Wetness Class: I

Wetness Grade: 3b

Available Water Wheat: 103 mm

Potatoes: 93 mm

Moisture Deficit Wheat: 78 mm

Potatoes: 66 mm

Moisture Balance Wheat: +25 mm

Potatoes: +27 mm

Droughtiness Grade: 2 (Calculated to 100 cm)

Final ALC Grade: 3b

Main Limiting Factor(s): WK

Remarks:

| SITE NAME | PROFILE NO. | SLOPE AND ASPECT | LAND USE | | PARENT MATERIAL |
|---|---|---|---|---|---|
| Hatt | Pit 2 (Nr Asp18) | 3°W | CER | Av Rainfall: 1223 mm<br>ATO: 1560 day °C | Devonian slate |
| JOB NO. | DATE | GRID REFERENCE | DESCRIBED BY | FC Days: 239<br>Climatic Grade: 2<br>Exposure Grade: - | PSD SAMPLES TAKEN |
| 28.97 | 23.4.97 | SX 3880 6305 | P Barnett | | TS 0-25cm: MCL (S45: Z32: C23%) |

| 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 | 35 | MCL | 7.5YR42 | 1%>2cm (S)<br>9%<2cm(S+D)<br>10% ZR | 0 | 0 | - | - | - | - | CF.VF* | - | Grad smooth |
| 2 | 85+ | HZCL | 2.5Y63 | 40%>2cm (S)<br>33%<2cm (S+D)<br>73% ZR | FDMO* 10YR58 | F* | Too stony | (Fr) | (M) | (G) | FVR | -- | |

Profile Gleyed From: -

Depth to Slowly Permeable Horizon: -

Wetness Class: I

Wetness Grade: 3a

Available Water Wheat: 97 mm

Potatoes: 96 mm

Moisture Deficit Wheat: 78 mm

Potatoes: 66 mm

Moisture Balance Wheat: +19 mm

Potatoes: +30 mm

Droughtiness Grade: 2 (Calculated to 85 cm)

*Final ALC Grade:* 3a

Main Limiting Factor(s): WK

Remarks: Pit dug in a headland bare patch, with only a few weeds ∴ few roots.
* Mottling and manganese staining in H2 associated with weathering of slate, not indicative of gleying

| SITE NAME | PROFILE NO. | SLOPE AND ASPECT | LAND USE | | PARENT MATERIAL |
|---|---|---|---|---|---|
| Hatt | Pit 3 (Asp31/46) | 4° s | PGR | Av Rainfall: 1223 mm<br>ATO: 1560day °C<br>FC Days: 239<br>Climatic Grade: 1<br>Exposure Grade: - | Devonian slate |
| JOB NO. | DATE | GRID REFERENCE | DESCRIBED BY | | PSD SAMPLES TAKEN |
| 28.97 | 23.4.97 | SX 3883 6278 | P Barnett | | - |

| 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 | HCL | 10YR53 | 10%ZR (vis) | FDFO 10YR58 | 0 | - | - | - | - | MF,VF | - | Clear smooth |
| 2 | 40 | ZC | 2.5Y63 | 40%ZR (vis) | CDFO 10YR58 | C | MFSAB | Fr | G | G | MVF | - | Clear Irreg |
| 3 | 63 | ZC | 2.5Y63 | 70%ZR (vis) | CDFO 10YR58 | C | Too stony | (Fr) | (M) | (G) | FVF | - | Ab Irreg |
| 4 | 80 | ZC | 5Y83 | 10%ZR (vis) | MDMO 10YR58 | 0 | M | Fm | P | P | FVF | - | - |

Profile Gleyed From: 24cm

Depth to Slowly Permeable Horizon: 63cm *

Wetness Class: III/IV

Wetness Grade: 4

Available Water Wheat: 95mm

Potatoes: 97mm

Moisture Deficit Wheat: 78mm

Potatoes: 66mm

Moisture Balance Wheat: +17 mm

Potatoes: +31mm

Droughtiness Grade: 2 (Calculated to 80 cm)

Final ALC Grade: 4

Main Limiting Factor(s): We

Remarks: H4 not present throughout pit: variable in depth, thickness and distribution. Where present in this pit, SPL does not persist below 80cm, reverting to shale similar to H3

| SITE NAME | PROFILE NO. | SLOPE AND ASPECT | LAND USE | | PARENT MATERIAL |
|---|---|---|---|---|---|
| Hatt | Pit 4 (Asp 32) | 4° S | PGR | Av Rainfall: 1223mm<br>ATO: 1560day °C | Devonian slate |
| JOB NO. | DATE | GRID REFERENCE | DESCRIBED BY | FC Days: 239<br>Climatic Grade: 1<br>Exposure Grade: - | PSD SAMPLES TAKEN<br>- |
| 28.97 | 23.4.97 | SX 3898 6285 | P Barnett | | |

| 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 | 30 | HCL | 10YR53 | 0 | 0 | - | - | - | - | - | MF, VF | - | Grad smooth |
| 2 | 45 | C | 2.5Y76 | 10%ZR,HR | CDFO 10YR58 | F | MCSAB | Fr | M | G | CVF | - | Grad smooth |
| 3 | 60+ | ZC | 5Y74 | 10%ZR | MDMO 10YR58 | F | WCSAB | Fm | P | P(low) | FVF | - | - |

Profile Gleyed From: 30cm

Depth to Slowly Permeable Horizon: 45cm

Wetness Class: IV

Wetness Grade: 4

Available Water Wheat: 117 mm

Potatoes: 106mm

Moisture Deficit Wheat: 78mm

Potatoes: 66 mm

Moisture Balance Wheat: +39mm

Potatoes: +40mm

Droughtiness Grade: 1 (Calculated to 100 cm)

Final ALC Grade: 4

Main Limiting Factor(s): We

Remarks:

| SITE NAME | PROFILE NO. | SLOPE AND ASPECT | LAND USE | | PARENT MATERIAL |
|---|---|---|---|---|---|
| Hatt | Pit 5 (Asp 78) | 4° NW | PGR | Av Rainfall: 1223mm<br>ATO: 1560 day °C | Devonian slate |
| JOB NO. | DATE | GRID REFERENCE | DESCRIBED BY | FC Days: 239<br>Climatic Grade: 2<br>Exposure Grade: | PSD SAMPLES TAKEN |
| 28.97 | 23.4.97 | SX 3898 6243 | P Barnett | | - |

| 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 | 10YR42 | 1% >2cm (S)<br>13%<2cm (S+D)<br>14%ZR | 0 | 0 | - | - | - | - | MF,VF | - | Ab smooth |
| 2 | 55 | HZCL | 10YR53 | 4%>2cm(S)<br>40%<2cm (S+D)<br>44%ZR | FDFO 10YR58 | F | Too Stony | (Fr) | (M) | (G) | CF,VF | - | Clear smooth |
| 3 | 83+ | ZC | 2.5Y62 | 45%>2cm (S)<br>31%<2cm (S+D)<br>76% ZR | FDFO 10YR58 | F | Too stony | (Fr) | (M) | (G) | FVF | - | - |

Profile Gleyed From: -

Depth to Slowly Permeable Horizon: -

Wetness Class: I

Wetness Grade: 3b

Available Water Wheat: 107 mm

Potatoes: 98 mm

Moisture Deficit Wheat: 78mm

Potatoes: 66 mm

Moisture Balance Wheat: +29mm

Potatoes: +32mm

Droughtiness Grade: 2 (Calculated to 100 cm)

Final ALC Grade: 3b

Main Limiting Factor(s): Wk

Remarks: Any mottles in H2 mainly associated with weathering stones

N.B. Asp 78 not found