ST WHITE'S FARM, CINDERFORD, GLOUCESTERSHIRE

AGRICULTURAL LAND CLASSIFICATION

Report of Survey

1. INTRODUCTION

Thirty eight hectares of land at St White's Farm, Cinderford, Gloucestershire were surveyed using the Agricultural Land Classification (ALC) System in November 1993. The survey was carried out for MAFF as part of its statutory role in connection with a planning application made to the Forest of Dean District Council. The whole farm was surveyed, of which twenty two hectares are subject to the planning application.

The fieldwork was carried out by ADAS (Resource Planning Team, Taunton Statutory Unit) at a scale of 1:10,000. The information is correct at this scale but any enlargement would be misleading. The distribution of grades identified in the survey area are detailed below and illustrated on the accompanying ALC map.

Distribution of ALC grades: St White's Farm, Cinderford

<table>
<thead>
<tr>
<th>Grade</th>
<th>Area (ha)</th>
<th>% of Survey Area</th>
<th>% of Agricultural land</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>10.1</td>
<td>26.6</td>
<td>27.7</td>
</tr>
<tr>
<td>3a</td>
<td>19.0</td>
<td>50.0</td>
<td>52.0</td>
</tr>
<tr>
<td>3b</td>
<td>7.0</td>
<td>18.3</td>
<td>19.2</td>
</tr>
<tr>
<td>4</td>
<td>0.4</td>
<td>1.1</td>
<td>1.1</td>
</tr>
<tr>
<td>Urban</td>
<td>0.2</td>
<td>0.5</td>
<td>100 (36.5ha)</td>
</tr>
<tr>
<td>Non Agric</td>
<td>0.9</td>
<td>2.4</td>
<td></td>
</tr>
<tr>
<td>Agric Bdgs</td>
<td>0.4</td>
<td>1.1</td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>38.0</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

The majority of the site was found to be of best and most versatile quality. The main limitation in the west is climate and workability in the east.
Distribution of ALC grades: Application Area, St White's Farm

<table>
<thead>
<tr>
<th>Grade</th>
<th>Area (ha)</th>
<th>% of Survey Area</th>
<th>% of Agricultural land</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>1.8</td>
<td>8.0</td>
<td>8.5</td>
</tr>
<tr>
<td>3a</td>
<td>17.6</td>
<td>78.6</td>
<td>82.6</td>
</tr>
<tr>
<td>3b</td>
<td>1.5</td>
<td>6.7</td>
<td>7.0</td>
</tr>
<tr>
<td>4</td>
<td>0.4</td>
<td>1.8</td>
<td>1.9</td>
</tr>
<tr>
<td>Urban</td>
<td>0.2</td>
<td>0.9</td>
<td>100 (21.3ha)</td>
</tr>
<tr>
<td>Non Agric</td>
<td>0.9</td>
<td>4.0</td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>22.4</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

The majority of the survey area has been mapped as Subgrade 3a.
2. INTRODUCTION

Thirty eight hectares of land at St White's Farm, Cinderford, Gloucestershire were surveyed using the Agricultural Land Classification (ALC) System in November 1993. The survey was carried out for MAFF as part of its statutory role in connection with a planning application made to the Forest of Dean District Council. The whole farm was surveyed, of which twenty two hectares are subject to the planning application.

The fieldwork was carried out by ADAS (Resource Planning Team, Taunton Statutory Unit) at a scale of 1:10,000 (approximately one sample point every hectare). The information is correct at this scale but any enlargement would be misleading. A total of 36 auger sample points and two soil profile pits were examined.

The published Provisional one inch to the mile ALC map of this area (MAFF 1972) shows the site to be all Grade 3, except the western part which has been mapped as urban. The recent survey supersedes this map having been carried out at a more detailed level and using the Revised Guidelines and Criteria for grading the quality of agricultural land (MAFF 1988).

These guidelines provide a framework for classifying land according to the extent to which its physical or chemical characteristics impose long-term limitations on agricultural use. The grading takes account of the top 120cm of the soil profile. A description of the grades used in the ALC System can be found in Appendix 2.

3. CLIMATE

The grade of the land is determined by the most limiting factor present. The overall climate is considered first because it can have an overriding influence on restricting land to a lower grade despite other favourable conditions.

Estimates of climatic variables were obtained for the site by interpolation from the Agricultural Climate Dataset (Meteorological Office 1989). The data are shown in Table 1. All of the site is limited to Grade 2 at best by the climatic regime in the area.

The parameters used for assessing overall climatic limitations are accumulated temperature, (a measure of the relative warmth of a locality) and average annual rainfall, (a measure of overall wetness). Climatic data on Field Capacity Days (FCD) and Moisture Deficits for wheat (MDW) and potatoes (MDP) are also shown. These data are used in assessing the soil wetness and droughtiness limitations referred to in later sections. Descriptions of the Wetness Classes used can be found in Appendix 3.
Table 1  Climatic Limitations: St White's Farm, Cinderford

<table>
<thead>
<tr>
<th>Grid Reference</th>
<th>SO 679 129</th>
<th>SO 662 128</th>
</tr>
</thead>
<tbody>
<tr>
<td>Altitude (m)</td>
<td>237</td>
<td>205</td>
</tr>
<tr>
<td>Accumulated Temp  (deg days)</td>
<td>1260 1297</td>
<td>1297 1297</td>
</tr>
<tr>
<td>Average Annual Rainfall (mm)</td>
<td>941 904</td>
<td>904 904</td>
</tr>
<tr>
<td>Overall Climatic Grade</td>
<td>2 2</td>
<td>2 2</td>
</tr>
<tr>
<td>Field Capacity (days)</td>
<td>200 196</td>
<td>196 196</td>
</tr>
<tr>
<td>Moisture Deficit, Wheat (mm)</td>
<td>68 74</td>
<td>74 74</td>
</tr>
<tr>
<td>Potatoes (mm)</td>
<td>49</td>
<td>56</td>
</tr>
</tbody>
</table>

4. RELIEF AND LANDCOVER

The survey area forms a ridge running north south, with land sloping away to the east and west. There are some slopes both to the east and west which are steep enough to restrict the versatility of the land. The highest point on the ridge is at 237m AOD. The lowest point in the east is at 205m AOD and in the west at 195m AOD.

At the time of survey the majority of the land was in grass with a small area that has been ploughed.

5. GEOLOGY AND SOILS

The geology of the site is shown on the published 1:50,000 scale solid and drift geology maps, sheets 233 and 234 (Geological Survey of England and Wales 1972). Similarly the soils were mapped by the Soil Survey of England and Wales in 1983 at a reconnaissance scale of 1:250,000.

The geology at the site is a series of rock types in bands running NE-SW through the site. From the east there is Tintern Sandstone (Upper Old Red Sandstone); Lower Limestone Shale, Lower Dolomite, Crease Limestone, Whitehead Limestone and Drybrook Sandstone all of Carboniferous Limestone Series.

The majority of the site has been mapped as the Crwbin Association. To the east the Eardiston 1 Association is mapped and the western part of the site has been included in the Urban area of Cinderford. Soils of the Crwbin Association are described as very shallow and shallow well drained loamy soils over limestone, often on steep slopes. the Eardiston 1 soils are described as well drained reddish coarse soils over sandstone, which is shallow in places especially on brows of hills.

The recent survey found virtually stoneless light textured soils in the west and heavier soils in the east. All the soils are well drained.
6. AGRICULTURAL LAND CLASSIFICATION

The distribution of ALC grades identified in the survey area is detailed in Table 2 and shown on the accompanying ALC map. The information is correct at the scale shown but any enlargement would be misleading.

Table 2 Distribution of ALC grades: St White's Farm, Cinderford

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<td>TOTAL</td>
<td>38.0</td>
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Table 3 Distribution of ALC grades: Application Area, St White's Farm

<table>
<thead>
<tr>
<th>Grade</th>
<th>Area (ha)</th>
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<td>100 (21.3ha)</td>
</tr>
<tr>
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<td>0.9</td>
<td>4.0</td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>22.4</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

Grade 2

The western part of the site has been mapped as Grade 2. The main limitation here is the overall climate which limits the soil to Grade 2. The soils have no physical or chemical limitations. The soils are well drained and are Wetness Class I. The topsoil texture of these soils is a medium sandy loam and the subsoils have the same texture. These textures were confirmed by particle size distribution analysis. The soils are virtually stonefree and are reddish in colour.

Subgrade 3a

The eastern part of the site has been mapped as Subgrade 3a. These soils are also limited to climatic Grade 2 but have a greater limitation caused by the combination of topsoil texture and the number of days that the soil is at field
capacity. This is a workability limitation. The topsoil texture of these soils is heavy clay loam. There are occasional profiles in this unit with medium clay loam topsoils, but they do not form a large enough unit to map separately. The soils are well drained and are Wetness Class I. These soils are also reddish in colour and are slightly stony, but have no droughtiness limitation.

Subgrade 3b and Grade 4

There are areas in the east and west where the gradient exceeds 7 degrees. Here the versatility of the land is reduced because the types of machinery that can be safely used is limited. This land is downgraded to Subgrade 3b. Where the gradient exceeds 11 degrees the land has been further downgraded to Grade 4, reflecting the limited range of machinery that can be safely used.
APPENDIX 1

REFERENCES

GEOLOGICAL SURVEY OF ENGLAND AND WALES (1972) Solid and Drift edition. Sheet 233 Monmouth, Sheet 234 Gloucester 1:50,000 scale

MAFF (1972) Agricultural Land Classification Map sheet 143 Provisional 1:63,390 scale


METEOROLOGICAL OFFICE (1989) Published climatic data extracted from the agroclimatic dataset, compiled by the Meteorological Office

SOIL SURVEY OF ENGLAND AND WALES (1983) Sheet 5 Soils of South West England 1:250,000
APPENDIX 2

DESCRIPTION OF THE 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.

Descriptions of other land categories used on ALC maps

Urban

Built-up or 'hard' uses with relatively little potential for a return to agriculture including: housing, industry, commerce, education, transport, religious buildings, cemeteries. Also, hard-surfaced sports facilities, permanent caravan sites and vacant land; all types of derelict land, including mineral workings which are only likely to be reclaimed using derelict land grants.

Non-agricultural

'Soft' uses where most of the land could be returned relatively easily to agriculture, including: private park land, public open spaces, sports fields, allotments and soft-surfaced areas on airports/airfields. Also active mineral workings and refuse tips where restoration conditions to 'soft' after-uses may apply.

Agricultural buildings

Includes the normal range of agricultural buildings as well as other relatively permanent structures such as glasshouses. Temporary structures (eg polythene tunnels erected for lambing) may be ignored.

Open water

Includes lakes, ponds and rivers as map scale permits.
Land not surveyed

Agricultural land which has not been surveyed.

Where the land use includes more than one of the above land cover types, eg buildings in large grounds, and where map scale permits, the cover types may be shown separately. Otherwise, the most extensive cover type will usually be shown.

APPENDIX 3

DEFINITION OF SOIL WETNESS CLASSES

Wetness Class I

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

Wetness Class II

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

Wetness Class III

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

Wetness Class IV

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

Wetness Class V

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

Wetness Class VI

The soil profile is wet within 40cm 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.

edition).
<table>
<thead>
<tr>
<th>Site Name</th>
<th>Profile No.</th>
<th>Slope and Aspect</th>
<th>Land Use</th>
<th>Av Rainfall</th>
<th>PARENT MATERIAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>St Whites Farm</td>
<td>Pit 1</td>
<td>2° East</td>
<td>Ley</td>
<td>904 mm</td>
<td>Dolomite</td>
</tr>
<tr>
<td>Cinderford</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Job No.</th>
<th>Date</th>
<th>Grid Reference</th>
<th>Described By</th>
<th>FCDays</th>
<th>Climatic Grade</th>
</tr>
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<tbody>
<tr>
<td>100/93</td>
<td>11/11/93</td>
<td>ASP 9 SO 660129</td>
<td>GS/HLJ/GMS</td>
<td>196</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Horizon Number</th>
<th>Lowest Av Depth (cm)</th>
<th>Matrix and Ped Face Colours</th>
<th>Texture</th>
<th>Stoniness: Size, Shape, Type, and Field Method</th>
<th>Mottling Abundance, Contrast, Size and Colour</th>
<th>Structure: Development Size and Shape</th>
<th>Pores and Fissures</th>
<th>Structural Condition</th>
<th>Consistency</th>
<th>Roots: Abundance, Size and Nature</th>
<th>Calcium Carbonate Content</th>
<th>Mangan Concs etc</th>
<th>Horizon Boundary: Distinctness and form</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>30</td>
<td>5YR34</td>
<td>HCL</td>
<td>3% &gt;2mm MSST visual</td>
<td>None</td>
<td>MCSAB</td>
<td>Good</td>
<td>-</td>
<td>Friable</td>
<td>Many fine very fine</td>
<td>None</td>
<td>None</td>
<td>Clear smooth</td>
</tr>
<tr>
<td>2</td>
<td>120</td>
<td>2.5YR46 5YR54 (PED)</td>
<td>C</td>
<td>3% &gt; 2mm MSST visual</td>
<td>None</td>
<td>MCSAB</td>
<td>Low</td>
<td>Moderate</td>
<td>Firm</td>
<td>Common very fine</td>
<td>None</td>
<td>Few</td>
<td>-</td>
</tr>
</tbody>
</table>

Profile Gleyed From: Not gleyed

Depth to Slowly Permeable Horizon: None

Wetness Class: I

Wetness Grade: 3A

Available Water
- Wheat: 139mm
- Potatoes: 115mm

Moisture Deficit
- Wheat: 74mm
- Potatoes: 56mm

Moisture Balance
- Wheat: 65mm
- Potatoes: 59mm

Droughtiness Grade: 1 (to 120cm)

Final ALC Grade: 3A

Main Limiting Factor(s): Workability

Remarks:
- Dug to 80 cm. Augered to 120 cm.
## Site Name
St Whites Farm, Cinderford

## Job No.
100/93

## Date
11/11/93

## Horizon

<table>
<thead>
<tr>
<th>Horizon Number</th>
<th>Lowest Av Depth (cm)</th>
<th>Matrix and Ped Face Colours</th>
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<th>Structure: Development Size and Shape</th>
<th>Pores and Fissures</th>
<th>Structural Condition</th>
<th>Consistence</th>
<th>Roots: Abundance, Size and Nature</th>
<th>Calcium Carbonate Content</th>
<th>Mangan Content, etc.</th>
<th>Horizon Boundary, Distinctness and Form</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>40</td>
<td>5YR34</td>
<td>MSL</td>
<td>&lt;1% medium SST sieved</td>
<td>None</td>
<td>MMSAB</td>
<td>-</td>
<td>-</td>
<td>Friable</td>
<td>Many fine, very fine few medium</td>
<td>None</td>
<td>None</td>
<td>Clear smooth</td>
</tr>
<tr>
<td>2</td>
<td>55</td>
<td>2.5YR36</td>
<td>MSL</td>
<td>&lt;1% medium SST sieved</td>
<td>None</td>
<td>MCSAB (same medium)</td>
<td>Good</td>
<td>Moderate</td>
<td>Friable</td>
<td>Many fine, very fine</td>
<td>None</td>
<td>None</td>
<td>Clear smooth</td>
</tr>
<tr>
<td>3</td>
<td>115</td>
<td>2.5YR46</td>
<td>MSL</td>
<td>2% medium SST sieved</td>
<td>None</td>
<td>MCSAB (Breaking to medium)</td>
<td>Good</td>
<td>Moderate to good</td>
<td>Friable</td>
<td>Common fine, very fine</td>
<td>None</td>
<td>None</td>
<td></td>
</tr>
</tbody>
</table>

## Land Use
Ley

## Av Rainfall
904 mm

## ATO
1297°

## FC Days
196

## Climatic Grade
2

## Grid Reference
ASP7 SO 658129

## Description By
GC/HLJ/GMS

## Profile

- Matrix and Ped Face Colours: MSL (Medium-Sandy Loam)
- Texture: MSL (Medium-Sandy Loam)
- Stoniness: <1% medium SST sieved
- Mottling: None
- Structural Condition: MMSAB
- Consistence: Friable
- Roots: Many fine, very fine few medium
- Calcium Carbonate Content: None
- Mangan Content, etc.: None
- Horizon Boundary: Clear smooth

## Available Water
- Wheat: 153mm
- Potatoes: 112mm

## Moisture Deficit
- Wheat: 74mm
- Potatoes: 56mm

## Moisture Balance
- Wheat: 79mm
- Potatoes: 56mm

## Droughtiness Grade
1 (to 115cm)

## Final ALC Grade
2

## Main Limiting Factor(s)
Climate

## Remarks
Dug to 90. Augered to 115 (IMP)

## NL336