

8FCS 6216

100/93

## 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

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

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

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

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**

Grid Reference	SO 679 129	SO 662 128
Altitude (m)	237	205
Accumulated Temperature (deg days)	1260	1297
Average Annual Rainfall (mm)	941	904
Overall Climatic Grade	2	2
Field Capacity (days)	200	196
Moisture Deficit, Wheat (mm)	68	74
Potatoes (mm)	49	56

#### **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**

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

**Table 3 Distribution of ALC grades: Application Area, St White's Farm**

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

### 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 1:63,360 scale**

**MAFF (1988) Agricultural Land Classification of England and Wales (Revised guidelines and criteria for grading the quality of agricultural land ) Alnwick**

**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.**

**Source: MAFF (1988) Agricultural Land Classification of England and Wales (Revised guidelines and criteria for grading the quality of agricultural land) Alnwick.**

## **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.

**Source:** Hodgson, J M (in preparation) Soil Survey Field Handbook (revised edition).

SITE NAME		PROFILE NO.		SLOPE AND ASPECT		LAND USE		Av Rainfall: 904 mm			PARENT MATERIAL		
St Whites Farm Cinderford		Pit 1		2° East		Ley		ATO: 1297°			Dolomite		
JOB NO.		DATE		GRID REFERENCE		DESCRIBED BY		FC Days: 196			TOPSOIL PSD SAMPLE		
100/93		11/11/93		ASP 9 SO 660129		GS/HLJ/GMS		Climatic Grade: 2			RPT/GMS 281		
Horizon Number	Lowest Av Depth (cm)	Matrix and Ped Face Colours	Texture	Stoniness: Size, Shape, Type, and Field Method	Mottling Abundance, Contrast, Size and Colour	Structure: Development Size and Shape	Pores and Fissures	Structural Condition	Consistence	Roots: Abundance, Size and Nature	Calcium Carbonate Content	Mangan Concs etc	Horizon Boundary: Distinctness and form
1	30	5YR34	HCL	3% >2mm MSST visual	None	MCSAB	Good	-	Friable	Many fine very fine	None	None	Clear smooth
2	120	2.5YR46 5YR54 (PED)	C	3% > 2mm MSST visual	None	MCSAB	Low	Moderate	Firm	Common very fine	None	Few	-

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		PROFILE NO. Pit 2		SLOPE AND ASPECT 4° West		LAND USE Ley		Av Rainfall: 904 mm ATO: 1297° FC Days: 196 Climatic Grade: 2			PARENT MATERIAL Limestone		
JOB NO. 100/93		DATE 11/11/93		GRID REFERENCE ASP7 SO 658129		DESCRIBED BY GC/HLJ/GMS					TOPSOIL PSD SAMPLE RPT/GMS 284		
Horizon Number	Lowest Av Depth (cm)	Matrix and Ped Face Colours	Texture	Stoniness: Size, Shape, Type, and Field Method	Mottling Abundance, Contrast, Size and Colour	Structure: Development Size and Shape	Pores and Fissures	Structural Condition	Consistence	Roots: Abundance, Size and Nature	Calcium Carbonate Content	Mangan Concs etc	Horizon Boundary: Distinctness and form
1	40	5YR34	MSL	<1% medium SST sieved	None	MMSAB	-	-	Friable	Many fine, very fine few medium	None	None	Clear smooth
2	55	2.5YR36	MSL	<1% medium SST sieved	None	MCSAB (some medium)	Good	Moderate	Friable	Many fine, very fine	None	None	Clear smooth
3	115	2.5YR46	MSL	2% medium SST sieved	None	MCSAB (Breaking to medium)	Good	Moderate to good	Friable	Common fine, very fine	None	None	

Profile Gleyed From: Not gleyed

Depth to Slowly Permeable Horizon: No SPL

Wetness Class: 1

Wetness Grade: I

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)