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Land at Warren Farm,  
Knockdown, Tetbury

**AGRICULTURAL LAND CLASSIFICATION  
REPORT OF SURVEY**

Resource Planning Team  
Taunton Statutory Unit

December 1993

**ADAS** 

# AGRICULTURAL LAND CLASSIFICATION

## LAND AT WARREN FARM , KNOCKDOWN , TETBURY

### REPORT OF SURVEY

#### SUMMARY

1. The site, an area of 16.1 ha of land south of Knockdown near Tetbury , was graded using the Agricultural Land Classification (ALC) system in December 1993. The survey was carried out on behalf of MAFF in response to an enquiry regarding land quality.

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. A total of 16 auger borings and a soil profile pit were examined. The entire site (16.1 ha) is graded 3a as illustrated on the accompanying map.

The site occupies a gently undulating area of arable land and outdoor pigs. Soils are similar across the whole area and comprise shallow heavy clay loam topsoils over well drained clay loam subsoils which are stony at depth. All the land is good quality and limited by the workability of the topsoils and also experiences a slight drought limitation.

## 2. INTRODUCTION

An area of 16.1 hectares of land south of Knockdown near Tetbury was surveyed on behalf of MAFF, as part of its statutory role in the response to an enquiry regarding land quality. The survey was carried out in December 1993 by ADAS (Resource Planning Team, Taunton Statutory Unit) using the Agricultural Land Classification (ALC) system and conducted at a scale of 1:10,000 (approximately one sample point for every hectare of agricultural land). The 16 borings were supplemented by a soil inspection pit used to assess subsoil conditions. The information is correct at the scale shown but any enlargement would be misleading.

The published Provisional 1" to the mile ALC map of this area (MAFF 1970) shows most of the site to be Grade 3 with a small area in the north which is Grade 2. The current survey supersedes any previous surveys and was undertaken to provide a more detailed representation of the agricultural land quality using the Revised Guidelines and Criteria (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 120 cm 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 lower grades despite other favourable conditions.

Climatic data for the site was interpolated from the published Agricultural Climate Dataset (Meteorological Office 1989). The parameters used for assessing climate are accumulated temperature (a measure of the relative warmth of a locality) and average annual rainfall (a measure of overall wetness). The results shown in Table 1 indicate that there is no overall climatic limitation.

**Table 1 Climatic interpolations: Warren farm Knockdown**

Grid Reference	ST 837 881
Altitude (m)	133
Accumulated Temperature (day deg)	1385
Average Annual Rainfall (mm)	911
Field Capacity (Days)	199
Moisture Deficit, Wheat (mm)	81
Potatoes (mm)	66
Overall Climatic Grade	1

Climatic data on Field Capacity Days (FCD) and Moisture Deficits for wheat (MDW) and potatoes (MDP) are also shown. This data is used in assessing the soil wetness and droughtiness limitations referred to in Section 6. A description of soil Wetness Classes used are included in Appendix 3.

No local climatic factors such as exposure were noted in the survey area.

#### 4. RELIEF AND LANDCOVER

The site occupies a gently undulating area, the highest point being 135 m AOD, falling to 125 m AOD on the southern boundary. At the time of survey the land was growing winter cereals in the southern field and outdoor pigs occupied the north.

#### 5. GEOLOGY AND SOILS

The published 1:50,000 scale solid and drift geology map, sheet 251 (Geological Survey of England and Wales 1970) shows most of the site to be underlain by Shelly Limestone. A small area of land to the west of Warren Barn is underlain by Great Oolite.

The Soil Survey of England and Wales mapped the soils of the area in 1983, at a reconnaissance scale of 1:250,000. This map shows the soils across the entire site to comprise Elmton 2 Association. These soils are described as shallow well drained brashy calcareous fine loamy soils over limestone, with some fine loamy over clayey soils.

The recent survey indicates there is just one soil type in the area which gives rise to the Subgrade 3a land. The soils comprise heavy clay loam topsoils over clay loam and clay subsoils which overlie limestone at variable depths between 35 to 75 cm

#### 6. AGRICULTURAL LAND CLASSIFICATION

The whole of the survey area (16.1 ha) was found to be Subgrade 3a as shown on the accompanying map. The Field Capacity Days (198 days) and the heavy clay loam topsoil texture restricts the workability of the land and thus limits the range and yield of crops which can be regularly grown. In some places a slight droughty limitation is imposed by the shallow limestone.

## APPENDIX 1

### REFERENCES

GEOLOGICAL SURVEY OF ENGLAND AND WALES (1970) Solid and Drift edition. Sheets 251, 1:63,360 scale

MAFF (1970) Agricultural Land Classification Map Sheet 156 Provisional 1:63,360 scale

MAFF (1988) Agricultural Land Classification of England and Wales (revised guidelines and criteria for grading the quality of 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 scale

## 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 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 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).



SITE NAME		PROFILE NO.		SLOPE AND ASPECT		LAND USE		Av Rainfall: 911			PARENT MATERIAL		
Warren Farm, Knockdown		Pit 1		0°		Winter wheat		ATO: 1385			Shelly limestone		
JOB NO.		DATE		GRID REFERENCE		DESCRIBED BY		FC Days: 198					
114/93		10/12/93		ASP 10		N A Done		Climatic Grade: 1					
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	20	10YR43	HCL	Neg	-	Cultivation zone	-	-	-	Many fine and very fine	None	None	Clear/smooth
2	45	75YR44	HCL	2% SLST (est)	-	Mod dev CSAB	>0.5%	Moderate	Friable	Many fine	None	None	Clear/smooth
3	60	75YR46	HZCL	5% SLST (est)	-	Mod dev MSAB	>0.5%	Moderate	Friable	Common fine	None	None	Clear/wavy
4	75	10YR46	C.	27% >2 cm sieved 5% <2 cm 32% SLST	-	Too stony to assess (platy)	>0.5% fissures	Moderate	Friable	Few roots obs	Calc	None	

Profile Gleyed From: -  
Depth to Slowly Permeable Horizon: -  
Wetness Class: I  
Wetness Grade: 3a

Available Water Wheat: 107  
Potatoes: 118  
Moisture Deficit Wheat: 81  
Potatoes: 66  
Moisture Balance Wheat: 26  
Potatoes: 52  
Droughtiness Grade: 2

Final ALC Grade: 3a  
Main Limiting Factor(s): Workability

Remarks:  
Pit dug to 75 cm, below which impenetrable limestone.