

19/94

Crosskeys, Hardwicke, Gloucester
AGRICULTURAL LAND CLASSIFICATION
REPORT OF SURVEY

Resource Planning Team
Taunton Statutory Unit

February 1994

ADAS 

LAND AT CROSSKEYS, HARDWICKE, GLOUCESTER

AGRICULTURAL LAND CLASSIFICATION

Report of Survey

1. SUMMARY

An area of 7 hectares of land at Crosskeys, Hardwicke near Gloucester was graded using the Agricultural Land Classification (ALC) System in February 1994. The survey was carried out for MAFF as part of its statutory role in connection with an ad hoc planning application for a motorway service area.

The fieldwork was carried out by ADAS's 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 7 auger borings and 1 soil profile pit were examined.

The distribution of ALC grades identified in the survey area is detailed below and illustrated on the accompanying map.

Distribution of ALC grades: Crosskeys, Hardwicke

Grade	Area (ha)	% of Survey Area	% of Agricultural Land
3a	3.6	49	55
3b	2.9	39	45
Farm buildings	0.1	1	
Urban	0.8	11	
TOTAL	7.4		

2. INTRODUCTION

An area of 7 hectares of land at Crosskeys, Hardwicke near Gloucester was graded using the Agricultural Land Classification (ALC) System in February 1994. The survey was carried out for MAFF as part of its statutory role in connection with an ad hoc planning application for a motorway service area.

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The published Provisional 1" to the mile ALC map of this area (MAFF 1972) shows the entire site to be Grade 3. 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).

The Agricultural Land Classification provides 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 lower grades despite other favourable conditions.

Estimates of climatic variables were obtained for the site by interpolation from the 5km grid Database (Meteorological Office 1989) and are shown in Table 1.

The parameters used for assessing overall climatic limitation are accumulated temperature, (a measure of the relative warmth of a locality) and average annual rainfall, (a measure of overall wetness). The values shown in Table 1 reveal that there is no overall climatic limitation.

No locally limiting climatic factors such as exposure were noted in the survey area. 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 Section 6.

Table 1 Climatic Interpolations: Crosskeys, Hardwicke

Grid Reference	SO 800 118
Height (m)	15
Accumulated Temperature (day deg)	1510
Average Annual Rainfall (mm)	725
Overall Climatic Grade	1
Field Capacity (Days)	159
Moisture Deficit, Wheat (mm)	108
Potatoes (mm)	101

4. RELIEF AND LAND COVER

The site is flat and lies at an altitude of 20m AOD. The site was planted to winter cereals at the time of the survey.

5. GEOLOGY AND SOILS

The published 1:50,000 scale solid and drift geology map, sheet 234 (Geological Survey of England and Wales 1975), shows the land on the site to be underlain by Lower Jurassic Clays.

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 to be of two associations within the survey area. The majority of the site is mapped as the Badsey 2 Association. This is described as well drained fine loamy soils over limestone. There is a small area of the Evesham 2 Association in the south. These soils are described as slowly permeable calcareous clayey soils. During the recent survey the site was found to contain both of these associations, although there were differences in their distribution.

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: Crosskeys, Hardwick

Grade	Area (ha)	% of Survey Area	% of Agricultural Land
3a	3.6	49	55
3b	2.9	39	45
Farm buildings	0.1	1	
Urban	0.8	11	
TOTAL	7.4		

Subgrade 3a

The land graded as 3a has a wetness limitation. The topsoil has a texture of medium sandy loam, and overlies an upper subsoil of sandy clay loam, becoming clay at depth. There is a slowly permeable layer from approximately 30cm depth, which in conjunction with the topsoil texture of medium clay loam and the average days at field capacity (FCD) of 159 leads to a grade of 3a. Pit 1 is characteristic of this unit.

Subgrade 3b

The land graded as 3b is also downgraded due to a wetness limitation. The topsoil texture is medium or heavy clay loam, with a slowly permeable layer occurring above 35cm. The heavier topsoil texture leads to a grading of 3b.

APPENDIX 1

REFERENCES

GEOLOGICAL SURVEY OF ENGLAND AND WALES (1975) Solid and drift edition. 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: 725			PARENT MATERIAL		
Crosskeys, Hardwicke		IP		0		Winter Cereals		ATO: 1510			Jurassic Clays		
JOB NO.		DATE		GRID REFERENCE		DESCRIBED BY		FC Days: 159					
19/94		16/2/94		SO 799118		P Woode		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	28	10YR4/2	MSL	-	-	Moderate medium subangular blocky	Many	Moderate	Friable	Common fine	No	None	Abrupt smooth
2	78	10YR6/4	HSCL	-	Many distinct ochreous	Moderate coarse prismatic	Common exposed <0.5% biopores in ped	Moderate	Friable	Few fine	No	Few coarse	Abrupt smooth
3	95+	2.5Y6/2	ZC	-	Many distinct ochreous	Moderate coarse prismatic	<0.5% biopores in ped	Poor	Firm	V. few fine	Strongly calcareous	None	-

Profile Gleyed From: 28
Depth to Slowly Permeable Horizon: 28
Wetness Class: 4
Wetness Grade: 3a

Available Water Wheat: 142
Potatoes: 111
Moisture Deficit Wheat: 108
Potatoes: 101
Moisture Balance Wheat: 34
Potatoes: 10
Droughtiness Grade: 2
Assumed horizon 3 to 120 cm

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

Remarks: