

18/94

Meads Farm, Wickwar
AGRICULTURAL LAND CLASSIFICATION & SOIL
PHYSICAL CHARACTERISTICS
REPORT OF SURVEY

Resource Planning Team
Taunton Statutory Unit

January 1994

ADAS 

MEADS FARM, WESTEND, WICKWAR, AVON

AGRICULTURAL LAND CLASSIFICATION AND SOIL PHYSICAL CHARACTERISTICS

Report of survey

1. SUMMARY

Five hectares of land at Meads Farm, Westend, Wickwar were surveyed in February 1994. The survey was carried out on behalf of MAFF as part of its statutory role in connection with a planning application made to Avon County Council under the Town and Country Planning General Development Order 1988.

The fieldwork was carried out by ADAS (Resource Planning Team, Taunton Statutory Unit) at a scale of 1: 1 0,000. The information is correct at this scale but any enlargement would be misleading. The distribution of grades identified in the survey area is detailed below and illustrated on the accompanying ALC map.

Distribution of ALC grades: Meads Farm

Grade	Area (ha)	% of Survey Area	% of Agricultural Land
3b	4.6	86.9	100
Not Surveyed	0.7	13.1	100
TOTAL	5.3	100%	(4.6ha)

All of the lower land is downgraded on the basis of wetness to Subgrade 3b. The area of steeper land is downgraded to Subgrade 3b. A small part of the site has been disturbed as part of the adjacent site workings.

2. INTRODUCTION

Five hectares of land at Meads Farm, Westend, Wickwar were surveyed in February 1994. The survey was carried out on behalf of MAFF as part of its statutory role in connection with a planning application made to Avon County Council under the Town and Country Planning General Development Order 1988.

The fieldwork was carried out by ADAS (Resource Planning Team, Taunton Statutory Unit) at a scale of 1:1 0,000 (approximately one sample point every hectare). The information is correct at this scale but any enlargement would be misleading. A total of 4 auger sample points and one soil profile pit were examined.

The published provisional one inch to the mile ALC map of this area (MAFF 1970) shows the site to be Grade 3. This scale is considered inadequate for the current purposes. 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 (MAFF1988).

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 interpolated for the site from the Agricultural Climate Dataset (Meteorological Office 1989). The data are shown in Table 1.

The parameters used for assessing overall climatic conditions 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 (MD") and potatoes (MDP) are also shown. These data are used in assessing the soil wetness and droughtiness limitations referred to in later sections. A description of the Wetness Classes used in quantifying the degree of wetness can be found in Appendix 3.

No local Climatic limitations were noted in the survey area.

Table 1 Climatic Interpolations: Meads Farm

Grid Reference	ST 715 892
Altitude (m)	70
Accumulated Temperature (day deg)	1460
Average Annual Rainfall (mm)	829
Overall Climatic Grade	1
Field Capacity Days	184
Moisture Deficit, Wheat (mm)	94
Moisture Deficit, Potatoes (mm)	83

4. RELIEF AND LANDCOVER

The majority of the site is flat and at a height of 65m AOD. To the east of the site the land rises steeply to 75m AOD. The slope has a gradient of 9 degrees. The southern end of this slope is man made increasing what was the natural slope.

At the time of survey the flat land was fallow. The steeper land was in grass.

5. GEOLOGY AND SOILS

The geology of the sites is shown on the published 1:63,360 scale solid and drift geology map, sheet 251 (Geological Survey of England and Wales 1970). The geology in the north is shown as Keuper Marl of the Triassic era. The south east corner of the site is shown as Clifton Down Limestone, and the south west corner as Cromhall Sandstone, both of the Carboniferous era.

The soils were mapped by the Soil Survey of England and Wales in 1983 at a reconnaissance scale of 1:250,000. The site is mapped as the Crwbin Association. Immediately to the west the Whimple 3 Association is mapped. Crwbin soils are described as very shallow and shallow well drained loamy soils over limestone, often found on steep slopes. The Whimple 3 soils are described as reddish fine loamy or fine silty over clayey soils with slowly permeable subsoils and they experience slight waterlogging.

The soils found in the recent survey were reddish and typical of the Whimple Association. Parts of the site had stones lying on the surface, but these did not persist with depth. A small area in the north west of the site had a rock outcrop which was close to the surface. A similar situation existed on the steeper land. The clay content of the soils increased with depth. The topsoil texture was medium clay loam.

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: Meads Farm

Grade	Area (ha)	% of Survey Area	% of Agricultural Land
3b	4.6	86.9	100
Not Surveyed	0.7	13.1	100
TOTAL	5.3	100%	(4.6ha)

Subgrade 3b

The lower land is mapped as Subgrade 3b. These soils have slowly permeable subsoils and are Wetness Class IV. The soils are generally reddish. Across parts of the site there are some large stones lying on the surface, but in the soil profile pit it was found that the stones did not persist into the subsoil. Droughtiness is not a limitation. In the north west of the site there is a small area where the parent rock is near the surface, but at the scale of mapping, this potentially lower grade area is not mapped separately. Some of the subsoils have manganese concretions present but there are no pale ped face colours as confirmed in a soil profile pit. The subsoils have the textural, structural and porosity requirements for a red soil to be slowly permeable. The topsoil texture is medium clay loam. The upper subsoil is heavy clay loam and the lower subsoil clay in texture.

The sloping land in the east is downgraded to Subgrade 3b on the basis of gradient. The slope has a gradient of 9 degrees. This limits the versatility of the land because not all types of agricultural machinery can be safely used on such slopes.

Not Surveyed

The sloping land in the south east of the site is disturbed land. The slope is man made and is associated with the adjacent site workings. The topographic map suggests that the natural slope would be less steep. The land has been disturbed within the last five years and will not have time to return to a stable and more natural structural condition. This land was therefore not surveyed.

7. SOIL RESOURCES

The areas referred to can be found on the accompanying Soil Resources map.

"**Topsoil**" is defined as the organic rich surface horizon. The topsoils at the site are medium clay loams with low stone contents. The depth of the topsoil was found to be slightly variable in the range 26-35cm. An average depth of 30cm of topsoil should be taken for the site. The topsoils have a weakly developed coarse subangular blocky structure. The soils are friable in consistence. There are few roots in the topsoil.

A total topsoil resource of 13,800m³ is available as shown in Table 3.

Table 3 Topsoil Resources

Map Unit	Depth (cm)	Area (ha)	Soils	Volume (m ³)
1	30	4.6	MCL	13,800

"**Subsoil**" is defined as the less organic rich lower horizons. There are two subsoil horizons found at the site. The upper subsoil is a stoneless heavy clay loam and is found from 30-50cm. This horizon has a moderately developed coarse subangular blocky structure which is tending towards angular blocky. The consistence is friable and has a moderate structural condition. The upper subsoil is porous. The lower subsoil is a stoneless clay extending to at least 120cm. The structure of this soil is moderately developed coarse angular blocky. The lower subsoil has a firm consistence and moderate structural condition with low porosity. Where the rock outcrops are near the surface the subsoil available is reduced. These small areas are not delineated and the total subsoil resource shown below will be slightly reduced as a result.

A maximum subsoil resource of 41,400m³ is available distributed as shown in Table 4.

Table 4 Subsoil Resources

Map Unit	Depth (cm)	Area (ha)	Soils	Volume (m ³)
1	30-50	4.6	HCL	9,200
1	50-120	4.6	C	32,200

41,400

SOIL RESOURCES: Soil Units

TEXTURE	DEPTH (cm)	STONES	AREA (ha)	VOLUME (m ³)
Unit 1				
MCL	0-30	<1%	4.6	13,800
HCL	30-50	<1%	4.6	9,200
C	50-120	<1%	4.6	<u>32,200</u>
				55,200

Abbreviations

MCL Medium clay loam
HCL Heavy clay loam
C Clay

APPENDIX 1

REFERENCES

GEOLOGICAL SURVEY OF ENGLAND AND WALES (1970) Solid and Drift edition. Sheet 251 Malmesbury, 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 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: 829 mm			PARENT MATERIAL			
Meads Farm		Pit 1	0°		Ploughed		ATO: 1460°			Keuper Marl			
JOB NO.		DATE	GRID REFERENCE		DESCRIBED BY		FC Days: 184			TOPSOIL SAMPLE			
18/94		7/2/94	ASP2 ST 715 8920		GMS		Climatic Grade: 1			RPT/GMS 361			
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	26	5YR43	MCL	0% Visual	none	WCSAB	Good porosity	-	Friable	Few fine	none	none	Smooth clear
2	46	2.5YR46	HCL	0% Visual	none	MCSAB tending to MCAB	Good porosity	Moderate	Friable	Few v. fine	none	Common	Smooth clear
3	120+	2.5YR36	C	0% Visual	none	MCAB	Low porosity	Moderate	Firm	Few v. fine	none	Common	

Profile Gleyed From: Not gleyed

Depth to Slowly Permeable Horizon: 46 cm

Wetness Class: IV

Wetness Grade: 3b

Available Water Wheat: 141 mm

Potatoes: 117 mm

Moisture Deficit Wheat: 94 mm

Potatoes: 83 mm

Moisture Balance Wheat: 47 mm

Potatoes: 34 mm

Droughtiness Grade: 1

Final ALC Grade: 3b

Main Limiting Factor(s): Wetness

Remarks:

Pit dug to 65 cm, augered to 120 cm. No pale ped faces. Scattering of surface stones across site.