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Marshall's Farm, Newent

# AGRICULTURAL LAND CLASSIFICATION
# REPORT OF SURVEY

Resource Planning Team
**Taunton Statutory Unit**

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ADAS

## MARSHALL'S FARM, NEWENT, GLOUCESTERSHIRE

## AGRICULTURAL LAND CLASSIFICATION

### Report of Survey

### 1. INTRODUCTION

Fourteen hectares of land at Marshall's Farm, Newent, Gloucestershire were surveyed using the Agricultural Land Classification (ALC) System in October 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 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. Details of the findings of the survey and the distribution of grades are detailed below.

**Distribution of ALC grades: Marshall's Farm**

| Grade | Area (ha) | % of Survey Area | % of Agricultural Land |
|---|---|---|---|
| 1 | 1.0 | 6.7 | 6.8 |
| 2 | 10.7 | 71.8 | 72.3 |
| 3b | 3.1 | 20.8 | 20.9 |
| Agric Bdgs | 0.1 | 0.7 | 100% (14.8ha) |
| TOTAL | 14.9 | 100% | |

The majority of the agricultural land is of best and most versatile quality.

## 2. INTRODUCTION

Fourteen hectares of land at Marshall's Farm, Newent, Gloucestershire were surveyed using the Agricultural Land Classification (ALC) System in October 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 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 12 auger sample points and one soil profile pit were examined.

The published Provisional one inch to the mile ALC map of this area (MAFF 1972) shows the western part of the site as Grade 1 and the east as Grade 2. 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.

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: Marshall's Farm**

| | | |
|---|---|---|
| Grid Reference | SO 715 275 | SO 719 274 |
| Altitude (m) | 71 | 50 |
| Accumulated Temperature (deg days) | 1441 | 1465 |
| Average Annual Rainfall (mm) | 769 | 753 |
| Overall Climatic Grade | 1 | 1 |
| Field Capacity (days) | 165 | 163 |
| Moisture Deficit, Wheat (mm) | 100 | 104 |
| Potatoes (mm) | 91 | 95 |

## 4. RELIEF AND LANDCOVER

The western part of the site is relatively flat at an altitude of 70m AOD. The land drops away to the east with slopes in places with gradients over 7 degrees. The lowest part of the site is in the east at 50m AOD.

At the time of survey the higher parts of the site had been reseeded whilst the sloping land was permenant grass being grazed by sheep.

## 5. GEOLOGY AND SOILS

The geology of the site is shown on the published 1:50,000 scale solid and drift geology map, sheet 216 (Geological Survey of England and Wales 1988). Similarly the soils were mapped by the Soil Survey of England and Wales in 1983 at a reconnaissance scale of 1:250,000.

The site mainly consists of a conglomerate from the Sherwood Sandstone Group. To the south, west and east the site is underlain by Bromsgrove Sandstone and mudstone of the Sherwood Sandstone Group.

The whole site is mapped as the Bridgnorth soil Association. This is described as well drained sandy and coarse loamy soils over sandstone. These soils are at risk from water and wind erosion.

The recent survey found the soils to be typical of the mapped Association. Some water erosion of the soil was found in the south west part of the site.

## 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: Marshall's Farm**

| Grade | Area (ha) | % of Survey Area | % of Agricultural Land |
|---|---|---|---|
| 1 | 1.0 | 6.7 | 6.8 |
| 2 | 10.7 | 71.8 | 72.3 |
| 3b | 3.1 | 20.8 | 20.9 |
| Agric Bdgs | 0.1 | 0.7 | 100% (14.8ha) |
| TOTAL | 14.9 | 100% | |

### Grade 1

A small area of Grade 1 was identified within the survey area. This soil is well drained and is Wetness Class I. The topsoil texture is a medium clay loam, which continues in the subsoil to depth. The soil is stonless and has no droughtiness limitation. The soil is versatile and has no limitations.

### Grade 2

The majority of the site has been mapped as Grade 2. These soils are well drained and Wetness Class I. The topsoil texture of this area is a medium sandy loam as confirmed by particle size distribution analysis. The soils are virtually stoneless. The upper subsoil is a loamy medium sand which often becomes a clay at depth. These profiles have a droughtiness limitation which slightly reduces the versatility of the soils and limits them to Grade 2. There are some profiles in this unit which have a slightly different sequence of horizons and are less droughty, qualifying for Grade 1, but they do not form a practical map unit at this scale and are included in the Grade 2 unit.

### Subgrade 3b

To the east of the site there is sloping land which has gradients of 10 degrees. This reduces the versatility of the land and limits it to Subgrade 3b. The types of machinery that can be safely used are limited by the gradient of the land.

### Other land

The old farm buildings have been mapped as Agricultural Buildings.

## APPENDIX 1

## REFERENCES

GEOLOGICAL SURVEY OF ENGLAND AND WALES (1988) Solid and Drift edition. Sheet 216 Tewkesbury, 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 Gradeá1.

### 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<br>Marshall's Farm<br>Newent | PROFILE NUMBER Pit 1 | SLOPE AND ASPECT<br>0° | LAND USE<br>Grass | Av Rainfall: 753mm<br>ATO: 1465deg | PARENT MATERIAL<br>Conglomerate of the Sherwood Sandstone Group |
|---|---|---|---|---|---|
| JOB NO.<br>98/93 | DATE<br>20/10/93 | GRID REFERENCE<br>SO 716 277 | DESCRIBED BY<br>GMS | FC Days: 163<br>Climatic Grade: 1 | Topsoil PSD Sample<br>RPT/GC 91 |

| 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 34 | 5YR44 | MSL | <1% visual | None | WCSAB | Good | Good | Friable | Many fine very fine | None | None | Abrupt smooth |
| 2 | 84 | 5YR46 | LMS | <1% visual | None | MCSAB | Low | Good | Friable | Few fine | None | None | Clear wavy |
| 3 | 120 | 2.5YR34 | C | None | None | MCSAB | Low | Moderate | Friable | Few very fine | None | Common | |

Profile Gleyed From: not gleyed

Depth to Slowly Permeable Horizon: no SPL

Wetness Class: I

Wetness Grade: 1

Available Water Wheat: 126mm

Potatoes: 92mm

Moisture Deficit Wheat: 104mm

Potatoes: 95mm

Moisture Balance Wheat: 22mm

Potatoes: -3mm

Droughtiness Grade: 2 (to 120cm)

Final ALC Grade: 2

Main Limiting Factor(s): Droughtiness

Remarks:

Topsoil texture confirmed by PSD analysis.

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