49/95

The Knoll in the Parish of Donhead St Mary
Agricultural Land Classification

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The Knoll, Cann Common

AGRICULTURAL LAND CLASSIFICATION

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THE KNOLL, CANN COMMON

AGRICULTURAL LAND CLASSIFICATION SURVEY

SUMMARY

The survey was carried out by ADAS on behalf of MAFF as part of its statutory role in response to an adhoc planning application to dispose of surplus soil by Dorset County Council made to Wiltshire County Council. The fieldwork at The Knoll, in the Parish of Donhead St Mary was completed in July 1995 at a scale of 1:10,000. Data on climate, soils, geology and from previous Agricultural Land Classification (ALC) Surveys was used and is presented in the report. The distribution of grades is shown on the accompanying ALC map and summarised below. Information is correct at this scale but could be misleading if enlarged.

Distribution of ALC grades: The Knoll

Grade	Area (ha)	% of Survey Area	% of Agricultural Land (10.4 ha)
2	2.5	24.0	24.0
3a	7.1	68.3	68.3
3b	0.8	7.7	7.7
TOTAL	10.4	100.0	100.0

The majority of the site is mapped as best and most versatile; the Grade 2 land is limited by workability with medium clay loam topsoils and the Subgrade 3A land is limited by workability in the north and droughtness in the south. There is a small area of steeper land limited to Subgrade 3B in the south.

1. INTRODUCTION

An Agricultural Land Classification (ALC) Survey was carried out in July 1995 at The Knoll in the Parish of Donhead St Mary on behalf of MAFF as part of its statutory role response to an adhoc planning application to dispose of surplus soil made to Wiltshire County Council. The fieldwork covering 10.4 ha of land was conducted by ADAS at a scale of 1:10,000 with approximately one boring per hectare of agricultural land. A total of 9 auger borings were examined and 1 soil profile pit used to assess subsoil conditions.

The published provisional one inch to the mile ALC map of this area (MAFF 1972) shows the grades of the site at a reconnaissance scale to be Grade 3 on The Knoll, but surrounding land is 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 120 cm of the soil profile. A description of the grades used in the ALC system can be found in Appendix 2.

2. 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 from the published agricultural climate dataset (Meteorological Office 1989). The parameters used for assessing overall 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 there is an overall climatic limitation which restricts the land to Grade 2.

Table 1: Climatic Interpolations: The Knoll

Grid Reference		ST 890 217
Altitude (m)		175
Accumulated Temperature (day °)		1365
Average Annual Rainfall (mm)		919
Overall Climatic Grade		2
Field Capacity Days		192
Moisture deficit (mm):	Wheat	89
	Potatoes	76

Climatic data on Field Capacity Days (FCD) and Moisture Deficits for wheat and potatoes are also shown. These data are used in assessing the soil wetness and droughtiness limitations referred to in later sections.

3. RELIEF AND LANDCOVER

The site forms the north east flanks of The Knoll, which itself comprises two merged Knolls. The site includes part of the col between the two. The land is sloping and has a maximum gradient of 11° at the highest point in the south. The remaining slopes are more gentle. At the time of survey all of the site was in grass.

4. GEOLOGY AND SOILS

The geology of the site is shown on the published (1:50,000) scale drift geology map, sheet 313 Institute of Geological Sciences 1977. The whole site is underlain by Lower Chalk of the Cretaceous era.

The soils were mapped by the Soil Survey of England and Wales in 1983 at a reconnaissance scale of 1:250,000 as the Upton 2 Association. These soils are described as shallow well drained calcareous silty over argillaceous chalk. There may be some deeper well drained calcareous clayey soils

The soils found during the recent survey are developed over chalk but on the lower slopes are deeper clay loams and clays than found on the higher land.

5. AGRICULTURAL LAND CLASSIFICATION

The distribution of ALC grades is shown in Table 2 and on the accompanying ALC map. This information could be misleading if shown at a larger scale.

Table 2: Distribution of ALC grades: The Knoll

Grade	Area (ha)	% of Survey Area	% of Agricultural Land (10.4 ha)
2	2.5	24.0	24.0
3a	7.1	68.3	68.3
3b	0.8	7.7	7.7
TOTAL	10.4	100.0	100.0

Grade 2

A small area is mapped as Grade 2. These soils have medium clay loam topsoils over heavy clay loams. These soils have chalk stones and in one boring the parent chalk was encountered. Slight evidence of wetness was seen in the east but all of this area is assessed as Wetness Class I (See Appendix 3). These soils experience a minor workability limitation.

Subgrade 3a

Part of this area experiences a moderate droughtiness limitation imposed by the presence of parent chalk shallow in the profile. Rooting was observed well into the chalk, but these medium clay loams over fractured chalk can be graded no better than 3a.

Subgrade 3b

A small area in the south of the site on the higher slope has gradients between 8 and 11° which imposes a moderate limitation to the use of machinery and is mapped as Subgrade 3b.

Resource Planning Team
Taunton Statutory Unit
July 1995

APPENDIX 1

REFERENCES

INSTITUTE OF GEOLOGICAL SCIENCES (1977) Drift Edition, Sheet 313, Shaftesbury 1:50,000.

MAFF (1972) Agricultural Land Classification Map, Sheet 166, 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) Climatological Data for Agricultural Land Classification.

SOIL SURVEY OF ENGLAND AND WALES (1983) Sheet 5, Soils of South West England, 1:250,000 scale.

APPENDIX 2

DESCRIPTION OF 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 landcover 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		PARENT MATERIAL
The Knoll	Pit 1	3°E	PGR	Av Rainfall: 919 mm ATO: 1365 day °C FC Days: 192 Climatic Grade: 2 Exposure Grade: 1	Lower Chalk
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY		SOIL SAMPLE REFERENCES
49/95	11/7/95	ST88952160	GMS		-

Horizon No.	Lowest Av. Depth (cm)	Texture	Matrix (Ped Face) Colours	Stoniness: Size,Type, and Field Method	Mottling Abundance, Contrast, Size and Colour	Mangan Concs	Structure: Ped Development Size and Shape	Consistence	Structural Condition	Pores (Fissures)	Roots: Abundance and Size	Calcium Carbonate Content	Horizon Boundary: Distinctness and form
1	20	MCL	10YR42 to 15cm 10YR53	0% >2cm 18% >2 mmCH (S+D)	None	None	-	WCMAB	-	Good	MVF,F	Yes	Clear Smooth
2	36	HCL	10YR63	>70% CH Fractured horizon	None	None	Fractured chalk	-	-	-	Many within chalk cracks	Yes	Clear Wavy
3	70+	HCL	10YR73	70% CH Fractured	None Some ochreous straining within chalk stones	None	Fractured chalk	-	-		Many within chalk cracks	Yes	

Profile Gleyed From: Not gleyed

Depth to Slowly Permeable Horizon: No SPL

Wetness Class: I

Wetness Grade: 2

Available Water Wheat: 82 mm

Potatoes: 88 mm

Moisture Deficit Wheat: 89 mm

Potatoes: 76 mm

Moisture Balance Wheat: -7 mm

Potatoes: 12 mm

Droughtiness Grade: 3A (Calculated to 70 cm)

Final ALC Grade: 3A

Main Limiting Factor(s): Droughtness

Remarks:

H2 White chalk
H3 Grey chalk
Top 10cm of H3 predominatly HCL, then chalk, 30% chalk used in AWC calc, for 36-46cm.