8FC5 5052 17/93

LAND ADJACENT TO
BRADFORD-ON-AVON GOLF COURSE

AGRICULTURAL LAND CLASSIFICATION
REPORT OF SURVEY

Resource Planning Team
Taunton Statutory Unit

April 1993

ADAS

LAND ADJACENT TO BRADFORD ON AVON GOLF COURSE

AGRICULTURAL LAND CLASSIFICATION

Report of Survey

1. INTRODUCTION

Twenty seven hectares of land between Trowbridge Road and the River Avon, adjacent to Bradford on Avon golf course were graded using the Agricultural Land Classification (ALC) System in April 1993. The survey was carried out for MAFF as part of its statutory role in connection with an ad hoc planning application for an extension to a golf course made to West Wiltshire District Council.

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 28 auger borings and 2 soil profile pits were examined.

The published Provisional 1" to the mile ALC map of this area (MAFF 1972) shows the site to be Grades 3 and 4. 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 the appendix.

Table 1 Distribution of ALC grades: Bradford on Avon

Grade	Area (ha)	% of Survey Area	% of Agricultural Land
1	1.4	5.1	5.1
2	5.5	20.1	20.1
3a	18.1	66.4	66.4
3b	1.4	5.2	5.2
4	0.9	3.2	3.2
TOTAL	27.3	100%	100%

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 lower grades despite other favourable conditions.

Estimates of climatic variables were obtained for the site by interpolation from the 5km grid Meteorolgical Office Database (Meteorological Office 1989) and are shown in Table 2.

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 2 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 5.

Table 2 Climatic Interpolations: Bradford on Avon

Grid Reference	ST 836 603	ST 844 598
Height (m)	43	29
Accumulated Temperature (day deg)	1500	1516
Average Annual Rainfall (mm)	774	758
Overall Climatic Grade	1	1
Field Capacity (Days)	173	170
Moisture Deficit, Wheat (mm)	102	104
Potatoes (mm)	94	97

3. RELIEF

The majority of the site is undulating, but the land drops away to the River Avon in the north. This slope is not limiting. The lowest part of the site in the north east is just below 30m OAD and the highest in the west is at 43m OAD.

4. GEOLOGY AND SOILS

The published 1:63,360 scale solid and drift geology map, sheet 281 (Geological Survey of England and Wales 1968), shows the majority of the land on the site to be underlain by Jurassic Cornbrash limestone (Oolitic). There is a small area of Jurassic Forest Marble near the River Avon and also by the River is an area of drift Alluvium.

The Soil Survey of England and Wales mapped the soils of the area in 1983, at a reconnaisance 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 Sherborne Association. This is described as shallow well drained brashy clayey soils. There is a small area of the Fladbury 1 Association along the river. These soils are described as poorly drained clayey soils.

During the recent survey much of the site was found to relate to the Sherborne Association although there were two distinct types of profile within this, differing on the depth of the relatively stone free horizon. A small area of deep well drained soil was identified, but the remaining areas were more poorly drained.

5. AGRICULTURAL LAND CLASSIFICATION

The distribution of ALC grades identified in the survey area is detailed in Section 1 and shown on the accompanying ALC map. The information is correct at the scale shown but any enlargement would be misleading.

Grade 1

A small area of well drained deep soils is located in the middle of the site. Here the medium clay loam topsoil lies over slightly sandier and more clayey subsoil. Both are stone free and show no evidence of wetness. The soil is Wetness Class I. The soil does not experience a droughtiness limitaion for the two representative crops of wheat and potatoes.

Grade 2

An area in the west of the site has been classified as Grade 2. These soils are well drained but have a significant stone content at depth. The soils are Wetness Class I. The combination of the medium silty clay loam topsoil, heavy clay loam and clay subsoils with the soft oolitic limestone content of the soil imposes a droughtiness limitation on this soil. In a soil profile pit stone contents were measured to be under 2% until 68cm where the content rose to 58%. The droughtiness limits the soil to Grade 2.

Subgrade 3a

The majority of the site has been downgraded to Subgrade 3a on the basis of droughtiness. Here the high stone content is found in the profile at a shallower depth than that described under Grade 2. In a soils profile pit the medium silty clay loam topsoil was measured to have 8% soft limestone, and the subsoil stone content rising from 47% to 77% by 53cm in a clay matrix. This imposes a greater

droughtiness limitation on the soil. The soil is Wetness Class I.

Subgrade 3b

A small area of wetter soil is found along the River Avon. These soils exhibit evidence of poor drainage caused by a slowly permeable layer in the profile. The soils are Wetness Class III and with the medium silty clay loam topsoil can be graded no better than 3b.

Grade 4

A small area beside the River Avon has been downgraded to Grade 4 on the basis of the extent to which it remains waterlogged during the year. The most appropriate Wetness Class is V.

APPENDIX 1

REFERENCES

GEOLOGICAL SURVEY OF ENGLAND AND WALES (1968) Solid and drift edition. Sheet 281 Frome, 1:63,360 scale

MAFF (1972) Agricultural Land Classification Map sheet 166 Provisional 1:63,360 scale

MAFF (1988) Agricultural Land Classification of Enlgland 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 SUB-GRADES

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 an 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 moist 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 parkland, 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.

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).

[NL176.WFW]

SITE NAME	PROFILE NUMBER	SLOPE AND ASPECT	LAND USE	Av Rainfall :- 774	PARENT MATERIAL
Bradford on Avon	1	1° E	Field Beans	ATO :- 1500	Jurassic Limestone (oolitic)
				FC Days :- 173	
JOB NO	DATE	GRID REFERENCE	DESCRIBED BY	Climatic grade :- 1	
17/93	27/4/93	ST 836 601	GMS/PB		

Horizon Number	Lowest Av Depth	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	10YR43	MZCL	5% >2cm 8% Total Sieved SLST	None	-	Good	-	Friable	Common Fine	Yes	None	Abrupt smooth
2	38	10YR46	C	20% >2cm 27% >2mm <2cm Total 57% SLST Sieved/Displ	None	WFSAB	Good	Good	Friable	Common Fine	Yes	None	Clear smooth
3	53	10YR56	C	54% Total Sieved/Disp SLST	None	WCSAB	Good	Moderate	Firm	Few V Fine	Yes	None	Clear smooth
4	70+	10YR56	C	22% >2mm <2cm 55% >2cm 77% Total SLST Sieved/Disp	None	-	Good	Moderate	-	V Few V Fine	Yest	None	

Profile Gleyed From:- Not

Depth to Slowly Permeable Horizon:- None

Wetness Class :- I

Wetness Grade :- 1

Available Water Wheat :- 93

Potatoes :- 80

Moisture Deficit Wheat :- 102

Potatoes :- 94

Moisture Balance Wheat :- -9

Potatoes :- -14

Droughtiness Grade :- 3A (to 120cm)

Final ALC Grade :- 3A

Main Limiting Factor(s) :- Droughtiness

Remarks :- Pit dug to 70cm

SITE NAME	PROFILE NUMBER	SLOPE AND ASPECT	LAND USE	Av Rainfall :- 758	PARENT MATERIAL
Bradford on Avon	2	0	Grass	ATO :- 1516	Jurassic Limestone (oolitic)
				FC Days :- 170	
JOB NO	DATE	GRID REFERENCE	DESCRIBED BY	Climatic grade :- 1	
17/93	28/4/93	ST 840 599	GMS/PB		

Horizon Number	Lowest Av Depth	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	25	10YR42	MZCL	0	Common rusty root channels	-	Good	-	-	Many fine and v.fine	None	None	Gradual smooth
2	40	10YR46	HCL	0	None	MM(+C) SAB(+AB)	Good	Mod. tending to good	Friable	Common fine + v. fine	None	None	Clear smooth
3	68	10YR43, 46 Pedface 10YR54	C	2% SLST Visual	Few weathering colours	MCSAB	Good	Moderate	Friable	Few v. fine	None	None	
4	75+	10YR46	C	28% >2mm <2cm 30% >2cm 58% Total SLST Sieved/Displ	Weathering colours	-	Good	Moderate	-	Few v. fine	Yes	None	

Profile Gleyed From:- Not

Depth to Slowly Permeable Horizon:- None

Wetness Class :- I

Wetness Grade :- 1

Available Water Wheat :- 128

Potatoes :- 117

Moisture Deficit Wheat :- 104

Potatoes :- 97

Moisture Balance Wheat :- 24

Potatoes :- 20

Droughtiness Grade :- 2 (to 120 cm)

Final ALC Grade :- 2

Main Limiting Factor(s) :- Droughtiness

Remarks :-

Pit dug to 75 cm