59/95

Highworth Road, Swindon

Agricultural Land Classification

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HIGHWORTH ROAD, SWINDON

AGRICULTURAL LAND CLASSIFICATION

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HIGHWORTH ROAD, SWINDON

AGRICULTURAL LAND CLASSIFICATION SURVEY

SUMMARY

The survey was carried out by ADAS on behalf of MAFF as part of its statutory role in the preparation of the Thamesdown Local Plan. The fieldwork at Highworth Road, Swindon was completed in September 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: Highworth Road

Grade	Area (ha)	% of Survey Area	% of Agricultural Land (39.0 ha)
2	13.5	33.8	34.6
3a	25.5	63.9	65.4
Urban	0.2	0.5	0.0
Non Agricultural	0.7	1.8	0.0
TOTAL	39.9	100.0	100.0

All of the agricultural land is mapped as best and most versatile. Two soil types were found. In the east and around Kingsdown Farmhouse stony heavy clay loams and clays were found which have a droughtness limitation, and are mapped as Subgrade 3a. The Grade 2 land has deep soils with heavy clay loam and silty clay loam topsoils which have a minor workability limitation.

1. INTRODUCTION

An Agricultural Land Classification (ALC) Survey was carried out in September 1995 at Highworth Road, Swindon on behalf of MAFF as part of its statutory role in the preparation of the Thamesdown Local Plan. The fieldwork covering 39.9 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 39 auger borings were examined and 2 soil profile pits used to assess subsoil conditions.

The published provisional one inch to the mile ALC map of this area (MAFF 1973) shows the grades of the site at a reconnaissance scale 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). 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 no overall climatic limitation.

Table 1: Climatic Interpolations: Highworth Road

Grid Reference		SU 174 885
Altitude (m)		111
Accumulated Temperature (day °)		1403
Average Annual Rainfall (mm)		688
Overall Climatic Grade		1
Field Capacity Days		154
Moisture deficit (mm):	Wheat	102
	Potatoes	93

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 is relatively flat with a maximum altitude of 113m AOD. The majority of the site had been recently ploughed after cereals. The smaller fields were in grass with two orchards in the south east. The old railway line is overgrown.

4. GEOLOGY AND SOILS

The geology of the site is shown on the published 1:63,000 scale solid and drift geology map, sheet 252 (Institute of Geological Sciences 1974.) The east and west of the site are mapped as *Upper Corallian Coral Rag. Through the centre of the site Lower Corallian silt and sand is* mapped.

The soils were mapped by the Soil Survey of England and Wales in 1983 at a reconnaissance scale of 1:250,000. The majority of the site is mapped as the Sherborne Association, with a lobe of Evesham 2 Association in the north. Sherborne soils are described as shallow well drained brashy calcareous clayey soils over limestone, associated with slowly permeable calcareous clayey soils. Evesham 2 soils are described as slowly permeable calcareous clayey soils.

The soils found during the recent survey in the east of the site and around Kingsdown Farmhouse were similar to Sherborne soils, but the rest of the site had lighter textured well drained soils.

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: Kingsdown Road

Grade	Area (ha)	% of Survey Area	% of Agricultural Land (39.0 ha)
2	13.5	33.8	34.6
3a	25.5	63.9	65.4
Urban	0.2	0.5	0.0
Non Agricultural	0.7	1.8	0.0
TOTAL	39.9	100.0	100.0

Grade 2

Two areas of Grade 2 are mapped. These soils have a minor workability limitation. Heavy clay loam and heavy silty clay loam topsoils overlie clay subsoils. There is occasionally some minor evidence of wetness low in the profile but the soils are porous and assessed as Wetness Class I (see Appendix 3).

Subgrade 3a

These stony soils have a moderate droughtness limitation imposed by stony subsoils (30%). The stone contents were assessed in a soil profile pit. The two small blocks of 3a have heavy clay loam and heavy silty clay loam topsoils. The large block of 3a has clay topsoils causing a moderate workability limitation. This area was impenetrable to the soil auger at shallow depths but in the soil profile pit it was found that the lower subsoils are gleyed but the stones in the profile aid overall drainage. The soils are assessed as Wetness Class I. Included in this unit is a single boring with a more severe wetness limitation which represents too small an area to be mapped separately.

Resource Planning Team
Taunton Statutory Unit
September 1995

APPENDIX 1

REFERENCES

INSTITUTE OF GEOLOGICAL SCIENCES (1974) Solid and Drift Edition, Sheet 252, Swindon 1:63,000.

MAFF (1973) Agricultural Land Classification Map, Sheet 157, 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
Highworth Road Swindon	Pit 2	0°	Ploughed	Av Rainfall: 688 mm ATO: 1403 day °C FC Days: 154 Climatic Grade: 1 Exposure Grade: 1	Silt and Sand
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY		SOIL SAMPLE REFERENCES
59/95	13/9/95	SU 173 088 62	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	26	HZCL	10YR42	Neg	None	None	-	-	-	-	MVF		Clear Smooth
2	80+	C	10YR44 (10YR43)	Neg	FFFO 10YR46	Few	MCAB tending to Prismatic	Friable	Mod	Many	MVF		

Profile Gleyed From: Not gleyed

Depth to Slowly Permeable Horizon: No SPL

Wetness Class: I

Wetness Grade: 2

Available Water Wheat: 112 mm

Potatoes: 120 mm

Moisture Deficit Wheat: 102 mm

Potatoes: 93 mm

Moisture Balance Wheat: 10 mm

Potatoes: 27 mm

Droughtiness Grade: 2 (Calculated 80 cm)

Final ALC Grade: 2

Main Limiting Factor(s): Workability

Remarks:

Mottles more distinct in disturbed soil in auger. Also patchy.

SITE NAME	PROFILE NO.	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
Highworth Road Swindon	Pit 1	0°	Ploughed	Av Rainfall: 688 mm ATO: 1403 day °C	Coral Rag
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY	FC Days: 154 Climatic Grade: 1 Exposure Grade: 1	SOIL SAMPLE REFERENCES
59/95	13/9/95	SU 177 588 53	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	24	C	10YR42	1%SLST>2cm 18%SLST>2mm 19% TOTAL (S&D)	None	None	-	-	-	-	CVF	Yes	Clear Smooth
2	45	C	10YR53	30% SLST (Visual)	None	None	WCSAB	Firm	Mod	Good	CVF	Yes	Clear Smooth
3	60+	C	10YR53	30% SLST (Visual)	CDDFOG 10YR56,52	None	MCAB	Firm	Poor	Good	FVF	Yes	

Profile Gleyed From: 45 cm

Depth to Slowly Permeable Horizon: No SPL

Wetness Class: I

Wetness Grade: 3a

Available Water Wheat: 83 mm

Potatoes: 87 mm

Moisture Deficit Wheat: 102 mm

Potatoes: 93 mm

Moisture Balance Wheat: - 19 mm

Potatoes: - 6 mm

Droughtiness Grade: 3A (Calculated to 80 cm)

Final ALC Grade: 3a

Main Limiting Factor(s): Workability

Remarks:

Horizon 2 + 3 too clayey to sieve for large stones.
Difficult to assess Horizon 3 structure.