Draycott Crescent Cam

Agricultural Land Classification

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Resource Planning Team
Bristol
FRCA Western Region

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DRAYCOTT CRESCENT CAM

AGRICULTURAL LAND CLASSIFICATION SURVEY

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INTRODUCTION

1 This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of 9 5 ha of land at Draycott Crescent Cam Field survey was based on 10 auger borings and 3 soil profile pits and was completed in September 1997

2 The survey was conducted by the Resource Planning Team of FRCA Western Region on behalf of MAFF in its statutory role in the preparation of the Stroud Local Plan

3 Information on climate geology and soils and from previous ALC surveys was considered and is presented in the relevant section Apart from the published regional ALC map (MAFF 1977) which shows the site at a reconnaissance scale as wholly Grade 3 the site had not been surveyed previously The current survey uses the Revised Guidelines and Criteria for grading the quality of agricultural land (MAFF 1988) and supersedes any previous ALC survey Grade descriptions are summarised in Appendix I

4 At the time of survey land cover was cereal and grass Other land which was not surveyed included a garage and forecourt

SUMMARY

5 The distribution of ALC grades is shown on the accompanying 1 10 000 scale ALC map The detail of information shown at this scale is appropriate to the intensity of field survey but could be misleading if enlarged or applied to small areas Areas are summarised in Table 1

Table 1 Distribution of ALC grades Draycott Crescent Cam

Grade	Area (ha)	% Surveyed Area (9 2 ha)
3a	7 1	77 2
3b	2 1	22 8
Other land	0 3	
Total site area	9 5	100 0

6 Subgrade 3a land agricultural land of good quality covers the majority of the Draycott Crescent site The soils are limited by moderate wetness limitations in the east and by soil droughtiness in the centre of the site where soils are stony A small area of moderate quality Subgrade 3b agricultural land is found in the north west of the site where soils are clayey and have a significant soil wetness limitation

CLIMATE

7 Estimates of climatic variables for this site were derived from the published agricultural climate dataset Climatological Data for Agricultural Land Classification (Meteorological Office 1989) using standard interpolation procedures Data for key points around the site are given in Table 2 below

8 Since the ALC grade of land is determined by the most limiting factor present overall climate is considered first because it can have an overriding influence by restricting land to a lower grade despite more favourable site and soil conditions Parameters used for assessing overall climate are accumulated temperature a measure of relative warmth and average annual rainfall a measure of overall wetness The results shown in Table 2 indicate that there is no overall climatic limitation

9 Climatic variables also affect ALC grade through interactions with soil conditions The most important interactive variables are Field Capacity Days (FCD) which are used in assessing soil wetness and potential Moisture Deficits calculated for wheat and potatoes which are compared with the moisture available in each profile in assessing soil droughtiness limitations These are described in later sections

Table 2 Climatic Interpolations Draycott Crescent Cam

Grid Reference		SO 746 012
Altitude (m)		35
Accumulated Temperature (day C)		1494
Average Annual Rainfall (mm)		812
Overall Climatic Grade		1
Field Capacity Days		179
Moisture deficit (mm)	Wheat	98
	Potatoes	90

RELIEF

10 Altitude ranges from 32 metres at the north east corner to 43 metres along the western boundary with gently sloping land from the north west of the site to the east of the site

GEOLOGY AND SOILS

11 The underlying geology of the site is shown on the published geology map (IGS 1972) as Third Terrace River and Fan gravel on the west of the site and Head deposits on the east The recent survey found stony soils on the sloping land in the west and centre of the site likely to relate to the river terrace materials Stoneless silty and clayey soils were identified across the flatter land in the north west and east of the site

12 Soils were mapped by the Soil Survey of England and Wales at a reconnaissance scale of 1 250 000 (SSEW 1983) as the Martock Association across the majority of the site with Oxpasture Association in the north

13 The Martock Soil Association is described as having greyish fine silty over clayey and fine silty stagnogleyic soils with much ochreous mottling in Jurassic and Palaeozoic siltstone and shale The Oxpasture Association soils are described as stagnogleyic orgillic brown earths These are fine loamy over clayey soils developed in fine textured drift over Jurassic and Cretaceous clays and silts The drift is described as mainly Head derived from higher ground and locally there could be some River Terrace deposits

14 In the recent survey soils of the Martock Association were found only in the north west of the site On the land which slopes from this area towards the centre of the site soils were found to be stony and in the east on flatter land the soils described were similar to the Oxpasture Association although clay was present at greater depths in the profiles than is described for the typical Oxpasture soil series

AGRICULTURAL LAND CLASSIFICATION

15 The distribution of ALC grades found by the current survey is shown on the accompanying 1 10 000 scale map and areas are summarised in Table 1 The detail of information shown at this scale is appropriate to the intensity of field survey but could be misleading if enlarged or applied to small areas

Subgrade 3a

16 Land of good quality covers the majority of the site The soils are of two contrasting types In the east on flat land the soils were described as having silty clay loam topsoils overlying heavier silty clay loam subsoils which passed onto clay at depth A profile pit confirmed the soils to be assessed as Wetness Class II or Wetness Class III dependent upon the depth to the clay On the land which rises from this area towards the west soils were found to be stony and a profile pit confirmed the total stone contents of the upper and lower subsoils to be up to 45% These soils are limited by soil droughtiness rather than soil wetness

Subgrade 3b

17 Land of moderate agricultural quality was identified in an isolated area in the north west of the site where the land flattens again after rising from the east The soils were described as having clay loam topsoils which immediately overlay slowly permeable clay to depth This was confirmed by a profile pit and the soils were assessed as Wetness Class IV

Other Land

18 This covers a small area of the site in the east where there is a garage garage forecourt and associated land

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September 1997

REFERENCES

INSTITUTE OF GEOLOGICAL SCIENCES (1972) Sheet 234 Gloucester 1 50 000 series Solid and Drift edition IGS London

HODGSON J M (Ed) (1997) Soil Survey Field Handbook Soil Survey Technical Monograph No 5 Silsoe

MAFF (1977) 1 250 000 series Agricultural Land Classification South West Region MAFF Publications Alnwick

MAFF (1988) Agricultural Land Classification of England and Wales Revised Guidelines and Criteria for grading the quality of agricultural land MAFF Publications Alnwick

METEOROLOGICAL OFFICE (1989) Climatological Data for Agricultural Land Classification Meteorological Office Bracknell

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

SOIL SURVEY OF ENGLAND AND WALES (1984) Soils and Their Use in South West England Bulletin No 14 SSEW Harpenden

APPENDIX I

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

Source MAFF (1988) Agricultural Land Classification of England and Wales Revised Guidelines and Criteria for Grading the Quality of Agricultural Land MAFF Publications Alnwick

APPENDIX II

DEFINITION OF SOIL WETNESS CLASSES

Soil wetness is classified according to the depth and duration of waterlogging in the soil profile

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 (Ed) (1997) Soil Survey Field Handbook Soil Survey Technical Monograph No 5 Silsoe

APPENDIX III

ABBREVIATIONS AND TERMS USED IN SURVEY DATA

Soil pit and auger boring information collected during ALC survey is held on a computer database and is reproduced in this report Terms used and abbreviations are set out below These conform to definitions contained in the Soil Survey Field Handbook (Hodgson 1997)

1 Terms used on computer database in order of occurrence

GRID REF National 100 km grid square and 8 figure grid reference

LAND USE At the time of survey

WHT	Wheat	**SBT**	Sugar Beet	**HTH**	Heathland
BAR	Barley	**BRA**	Brassicas	**BOG**	Bog or Marsh
OAT	Oats	**FCD**	Fodder Crops	**DCW**	Deciduous Wood
CER	Cereals	**FRT**	Soft and Top Fruit	**CFW**	Coniferous Woodland
MZE	Maize	**HRT**	Horticultural Crops	**PLO**	Ploughed
OSR	Oilseed Rape	**LEY**	Ley Grass	**FLW**	Fallow (inc Set aside)
POT	Potatoes	**PGR**	Permanent Pasture	**SAS**	Set Aside (where known)
LIN	Linseed	**RGR**	Rough Grazing	**OTH**	Other
BEN	Field Beans	**SCR**	Scrub		

GRDNT Gradient as estimated or measured by hand held optical clinometer

GLEY SPL Depth in centimetres to gleying or slowly permeable layer

AP (WHEAT/POTS) Crop adjusted available water capacity

MB (WHEAT/POTS) Moisture Balance (Crop adjusted AP crop potential MD)

DRT Best grade according to soil droughtiness

If any of the following factors are considered significant Y will be entered in the relevant column

MREL	Microrelief limitation	**FLOOD**	Flood risk	**EROSN**	Soil erosion risk
EXP	Exposure limitation	**FROST**	Frost prone	**DIST**	Disturbed land
CHEM	Chemical limitation				

LIMIT The main limitation to land quality The following abbreviations are used

OC	Overall Climate	**AE**	Aspect	**EX**	Exposure
FR	Frost Risk	**GR**	Gradient	**MR**	Microrelief

FL	Flood Risk	**TX**	Topsoil Texture	**DP**	Soil Depth
CH	Chemical	**WE**	Wetness	**WK**	Workability
DR	Drought	**ER**	Erosion Risk	**WD**	Soil Wetness/Droughtiness
ST	Topsoil Stoniness				

TEXTURE Soil texture classes are denoted by the following abbreviations

S	Sand	**LS**	Loamy Sand	**SL**	Sandy Loam
SZL	Sandy Silt Loam	**CL**	Clay Loam	**ZCL**	Silty Clay Loam
ZL	Silt Loam	**SCL**	Sandy Clay Loam	**C**	Clay
SC	Sandy clay	**ZC**	Silty clay	**OL**	Organic Loam
P	Peat	**SP**	Sandy Peat	**LP**	Loamy Peat
PL	Peaty Loam	**PS**	Peaty Sand	**MZ**	Marine Light Silts

For the sand loamy sand sandy loam and sandy silt loam classes the predominant size of sand fraction will be indicated by the use of the following prefixes

F Fine (more than 66% of the sand less than 0 2mm)
M Medium (less than 66% fine sand and less than 33% coarse sand)
C Coarse (more than 33% of the sand larger than 0 6mm)

The clay loam and silty clay loam classes will be sub divided according to the clay content **M** Medium (< 27% clay) **H** heavy (27 35% clay)

MOTTLE COL Mottle colour using Munsell notation

MOTTLE ABUN Mottle abundance expressed as a percentage of the matrix or surface described

F few <2% **C** common 2 20% **M** many 20 40% **VM** very many 40%+

MOTTLE CONT *Mottle contrast*

F faint indistinct mottles evident only on close inspection
D distinct mottles are readily seen
P Prominent mottling is conspicuous and one of the outstanding features of the horizon

PED COL Ped face colour using Munsell notation

GLEY If the soil horizon is gleyed a Y will appear in this column If slightly gleyed an S will appear

STONE LITH Stone Lithology One of the following is used

HR	All hard rocks and stones	**SLST**	Soft oolitic or dolimitic limestone

CH	Chalk	**FSST**	Soft fine grained sandstone
ZR	Soft argillaceous or silty rocks	**GH**	Gravel with non porous (hard) stones
MSST	Soft medium grained sandstone	**GS**	Gravel with porous (soft) stones
SI	Soft weathered igneous or metamorphic rock		

Stone contents are given in % by volume for sizes >2cm >6cm and total stone >2mm

STRUCT The degree of development size and shape of soil peds are described using the following notation

Degree of development	**WA**	Weakly developed Adherent	**WK**	Weakly developed
	MD	Moderately developed	**ST**	Strongly developed
Ped size	**F**	Fine	**M**	Medium
	C	Coarse	**VC**	Very coarse
Ped Shape	**S**	Single grain	**M**	Massive
	GR	Granular	**AB**	Angular blocky
	SAB	Sub angular blocky	**PR**	Prismatic
	PL	Platy		

CONSIST Soil consistence is described using the following notation

L	Loose	**VF**	Very Friable	**FR**	Friable	**FM**	Firm
VM	Very firm	**EM**	Extremely firm	**EH**	Extremely Hard		

SUBS STR Subsoil structural condition recorded for the purpose of calculating profile droughtiness **G** Good **M** Moderate **P** Poor

POR Soil porosity If a soil horizon has poor porosity with less than 0 5% biopores >0 5mm a Y will appear in this column

IMP If the profile is impenetrable to rooting a Y will appear in this column at the appropriate horizon

SPL Slowly permeable layer If the soil horizon is slowly permeable a Y will appear in this column

CALC If the soil horizon is calcareous with naturally occurring calcium carbonate exceeding 1% a Y will appear this column

2 Additional terms and abbreviations used mainly in soil pit descriptions

STONE ASSESSMENT

VIS	Visual	**S**	Sieve	**D**	Displacement

MOTTLE SIZE

EF	Extremely fine <1mm	**M**	Medium 5 15mm
VF	Very fine 1 2mm>	**C**	Coarse >15mm
F	Fine 2 5mm		

MOTTLE COLOUR May be described by Munsell notation or as ochreous (OM) or grey (GM)

ROOT CHANNELS In topsoil the presence of rusty root channels should also be noted

MANGANESE CONCRETIONS Assessed by volume

N	None		**M**	Many	20 40%
F	Few	<2%	**VM**	Very Many	>40%
C	Common	2 20%			

POROSITY

P	Poor	less than 0 5% biopores at least 0 5mm in diameter
G	Good	more than 0 5% biopores at least 0 5mm in diameter

ROOT ABUNDANCE

The number of roots per 100cm^2		Very Fine and Fine	Medium and Coarse
F	Few	1 10	1 or 2
C	Common	10 25	2 5
M	Many	25 200	>5
A	Abundant	>200	

ROOT SIZE

VF	Very fine	<1mm	**M**	Medium	2 5mm
F	Fine	1 2mm	**C**	Coarse	>5mm

HORIZON BOUNDARY DISTINCTNESS

Sharp	<0 5cm	**Gradual**	6 13cm
Abrupt	0 5 2 5cm	**Diffuse**	>13cm
Clear	2 5 6cm		

HORIZON BOUNDARY FORM Smooth wavy irregular or broken *

* See Soil Survey Field Handbook (Hodgson 1997) for details

SITE NAME	PROFILE NO	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
Draycott Crescent Cam	Pit 1 ASP 3	1 E W	S A	Av Rainfall 812 mm ATO 1494 day C	River Terrace Gravel
JOB NO	DATE	GRID REFERENCE	DESCRIBED BY	FC Days 179 Climatic Grade 1 Exposure Grade	PSD SAMPLES TAKEN
65/97	3/9/97	SO 7540 0120	SH		None

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	25	MZCL	25Y42	0	0	0					C V Fine Fibrous		Clear smooth
2	30	HZCL	10YR43	20% Total (VIS)	Many 10YR56/58 D st t Slightly cemented	0	Too stony and thin to determine	Fr		G	F V Fine		Abrupt smooth
3	60	C	59Y31	10% Total (VIS)	Many distinct 10YR56 and 25Y44/54	0	WK CSAB	Fm		P	FVF		

Profile Gleyed From 30 cm

Depth to Slowly Permeable Horizon 35 cm

Wetness Class IV

Wetness Grade 3b

Available Water Wheat mm

Potatoes mm

Moisture Deficit Wheat mm

Potatoes mm

Moisture Balance Wheat mm

Potatoes mm

Droughtiness Grade (Calculated to cm)

Final ALC Grade 3b

Main Limiting Factor(s) We

Remarks Augured down to 80 cm

SITE NAME	PROFILE NO	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
Draycott Crescent Cam	Pit 2 ASP 4	2 N E	CER	Av Rainfall 812 mm ATO 1494 day C FC Days 179 Climatic Grade 1 Exposure Grade	Head deposit
JOB NO	DATE	GRID REFERENCE	DESCRIBED BY		PSD SAMPLES TAKEN
65/97	3/9/97	SO 7460 0120	SH		None

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	25	MZCL	25Y42	0	0	0				G	CF+VF		Abrupt smooth
2	33	HZCL	10YR53	0	Few distinct 10YR56	0	MD CSAB	Fr		G	CF+VF		Clear smooth
3	55	HZCL	10YR53 25Y53	0	Common distinct 75YR56	0	ST CAB	Fm		G	CF+VF		Gradual smooth
4	80+	ZC	25Y53	0	Many distinct 10YR56	Many	MD C VCAB Some C PR	Fm		M	FF+VF		

Profile Gleyed From 33

Depth to Slowly Permeable Horizon

Wetness Class II/III

Wetness Grade 3a

Available Water Wheat mm

Potatoes mm

Moisture Deficit Wheat mm

Potatoes mm

Moisture Balance Wheat mm

Potatoes mm

Droughtiness Grade (Calculated to c)

Final ALC Grade 3a

Main Limiting Factor(s) We

Remarks H4 porosity moderate but looked at under dry field conditions pores more visible This could possibly be described as an SPL if examined in wetter conditions SPL at 55cm and Wetness Class III

SITE NAME	PROFILE NO	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
Draycott Crescent Cam	Pit 3 ASP 7	3 SW NE	CER	Av Rainfall 812 mm ATO 1494 day C FC Days 179 Climatic Grade 1 Exposure Grade	River Terrace Gravel
JOB NO	DATE	GRID REFERENCE	DESCRIBED BY		PSD SAMPLES TAKEN
65/97	3/9/97	SO 7460 0110	SH		None

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	30	MZCL	25YR42	2% 2 m 25% < 2 m 27% T t I HR (S+D)	0	0					CF + VF		Clear abrupt
2	60	HZCL	25YR53 /54	41% Total HR (S+D)	0	0	Too stony to determine	Fm	(M)	G	CF + VF		Clear abrupt
3	100	C	25Y53	45% T t I HR (S+D)	C distinct 75YR58	Common	Too stony to determine	Fm	(M)	M	FF + VF		

Profile Gleyed From

Depth to Slowly Permeable Horizon

Wetness Class I

Wetness Grade 2

Available Water	Wheat	97 mm
	Potatoes	83 mm
Moisture Deficit	Wheat	98 mm
	Potatoes	90 mm
Moisture Balance	Wheat	1 mm
	Potatoes	7 mm

Droughtiness Grade 3a (Calculated to 120 cm)

Final ALC Grade 3a

Main Limiting Factor(s) Dr

Remarks Augered through to 120 cm