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FAILAND FARM, FAILAND, AVON

AGRICULTURAL LAND CLASSIFICATION

CONTENTS

		Page
SUMMARY		1
1.	INTRODUCTION	2
2.	CLIMATE	2
3.	RELIEF AND LANDCOVER	2
4.	GEOLOGY AND SOILS	3
5.	AGRICULTURAL LAND CLASSIFICATION	3
6.	SOIL RESOURCES	4
APPENDIX 1	References	5
APPENDIX 2	Description of the grades and subgrades	6
APPENDIX 3	Definition of Soil Wetness Classes	8
MAP		

FAILAND FARM, FAILAND, AVON

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 application for a golf course at Failand Farm. A total of 97.8 ha of land was surveyed in October 1994 at a scale of 1:10,000.

Data on climate, soils, geology and previous Agricultural Land Classification (ALC) surveys was used and is presented in the report. The distribution of grades is show in the accompanying ALC map and summarised below. Information is correct at this scale but could be misleading if enlarged.

Distribution of ALC grades: Failand Farm

Grade	Area (ha)	% of Survey Area	% of Agricultural Land	
1	12.0	12.3	18.0	
2	12.5	12.8	18.7	
3a	39.3	40.2	58.9	
3b	1.3	1.3	2.0	
4	1.6	1.6	2.4	
Urban	4.8	4.9	0.0	
Non Agricultural	2.1	2.2	0.0	
Agricultural Buildings	0.9	0.9	0.0	
Woodland	23.3	23.8	0.0	
TOTAL	97.8	100.0	100.0	(66.7 ha)

Nearly all the agricultural land on the site is best and most versatile. The soils are very variable across the site with well drained slightly droughty, sandy soils in the north giving rise to Grades 1 and 2. Subgrade 3a land has clayey soils which suffer a moderate wetness limitation. Over 30 ha of the land is in woodland or other non-agricultural land use.

1. INTRODUCTION

An Agricultural Land Classification (ALC) Survey was carried out in October 1994 at Failand Farm, Failand on behalf of MAFF as part of its statutory role in response to an adhoc application to Woodspring District Council. The fieldwork covering 97.8 ha of land was conducted by ADAS at a scale of 1:10,000 (approximately one boring per hectare of agricultural land). A total of 70 auger borings were examined and 4 soil profile pits used to assess subsoil conditions.

The published provisional one inch to the mile ALC map of this area (MAFF 1971) shows the grade of the site at reconnaiscance scale to be entirely Grade 2 with woodlands shown as non-agricultural land.

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 to the land.

Table 1: Climatic Interpolations: Failand Farm

Grid Reference		ST 528 727
Altitude (m)		132
Accumulated Temperature (day °)		1400
Average Annual Rainfall (mm)		894
Overall Climatic Grade		1
Field Capacity Days		197
Moisture deficit (mm):	Wheat	80
	Potatoes	66

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 occupies an undulating area of land with most of the agricultural land around a knoll which rises to 140 m AOD north of Failand Farm. Areas of woodland to the south east of the site rise to 145 m. All the agricultural land was in grassland at the time of survey with the exception of one large field of maize. Several small areas of steeply sloping land have been identified as Subgrade 3b and Grade 4 on the accompanying map.

4. GEOLOGY AND SOILS

The geology of the site is shown on the published 1:50,000 Solid and Drift Geology Map sheet 264 (British Geological Survey 1974). The majority of the site is underlain by various types of Limestone beds in bands running east west. There is also a small deposit of Head near Roundhill Clump and 2 narrow bands of Dolomite and Mudstone near Fifty Acre Wood.

The soils were mapped by the Soil Survey of England and Wales in 1983 at a reconnaissance scale of 1:250,000, this showed the whole site consisted of soils from the Crwbin Association, which are described as being very shallow and shallow well drained loamy soils over limestone, often on steep slopes. Limestone pavement and other rock exposures are common.

The recent survey found the soils to be very variable. In the north of the site profiles comprise medium and fine sandy loam topsoils, over heavy clay loam and sandy clay loam subsoils. The stone contents vary, with the higher land in the centre of the site comprising very stony subsoils with approximately 40% stone within 30 cm. The remainder of the site comprises variable soils of clayey texture. These soils have heavy clay loam and clay subsoils which are stone free underlying medium silty clay loam and occasionally sandy silt loam topsoils. The subsoils to the west of the site are very variable with sandy lenses found in a generally clayey matrix. An area of more consistently lighter subsoils in the very west of the site has been outlined as Grade 2.

5. AGRICULTURAL LAND CLASSIFICATION

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

Table 2: Distribution of ALC grades: Failand Farm

Grade	Area (ha)	% of Survey Area	% of Agricultural Land	
1	12.0	12.3	18.0	
2	12.5	12.8	18.7	
3a	39.3	40.2	58.9	
3b	1.3	1.3	2.0	
4	1.6	1.6	2.4	
Urban	4.8	4.9	0.0	
Non Agricultural	2.1	2.2	0.0	
Agricultural Buildings	0.9	0.9	0.0	
Woodland	23.3	23.8	0.0	
TOTAL	97.8	100.0	100.0	(66.7 ha)

Grade 1

A total of 12 ha of Grade 1 land has been identified. These soils are generally well drained with little or no evidence of wetness and few subsoil stones. The light topsoil textures and moist climatic conditions impose no significant limitation on the agricultural use of this land.

Grade 2

An area of Grade 2 land has been identified north of Failand Farm. These soils exhibit evidence of wetness above 40 cm depth. The profiles are assessed as Wetness Class II (Appendix 3) which imposes a slight wetness limitation when found with light topsoil textures. The block of Grade 2 land in the west of the site comprises well drained soils with medium silty clay loam topsoil.

Subgrade 3a

Much of the agricultural land is of moderate quality due to the very variable lower subsoils which are gleyed within 40 and assessed as Wetness Class II. An area of clayey soils to the east of the site around Failand Farm exhibit a stronger wetness problem with slowly permeable layers found at approximately 60 cm. These soils are assessed as Wetness Class III and are also graded 3a. The occasional Grade 2 and Subgrade 3b profiles are present within this block, but are too localised to map at this scale.

Subgrade 3b and Grade 4

Small areas of steeper sloping land have been identified as poorer quality land and where the slopes exceed 7°and 11° are graded 3b and 4 respectively.

Non-Agricultural Land

A total of 23.3 ha of land is shown on the map as woodland. Areas of urban relate to the Country Club in the west of the site and non-agricultural land is playing fields. Failand Farm is shown as agricultural buildings.

Resource Planning Team
Taunton Statutory Unit
October 1994

[hNL733]

APPENDIX 1

REFERENCES

BRITISH GEOLOGICAL SURVEY (1974) Solid and Drift Edition, Sheet 264, Bristol

MAFF (1971) Agricultural Land Classification Map, Sheet 165, 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
Failand Farm	Pit 1	2° N	P Pasture	Av Rainfall: 894 mm ATO: 1400 day °C FC Days: 197 Climatic Grade: 1 Exposure Grade: 1	Lower limestone shale
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY		SOIL SAMPLE REFERENCES
115/94	20/10/94	ASP 51	N A Done		NAD/152

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	10YR43	-	-	-	-	-	-	-	Common fine	-	Gradual/ smooth
2	60	HCL	10YR54	Neg	cdom 10YR56	-	MDCSAB	Friable	M	G	Common fine + v fine	-	Clear/ smooth
3	120	C	10YR53 (10YR51)	Neg	Mdom 10YR58	Many	WD Adherent CSAB	Firm	P	Few	Few fine + v fine	-	-

Profile Gleyed From: 60

Depth to Slowly Permeable Horizon: 60

Wetness Class: III

Wetness Grade: 3a

VP336-14

Available Water Wheat: 138 mm

Potatoes: 115 mm

Moisture Deficit Wheat: 80 mm

Potatoes: 66 mm

Moisture Balance Wheat: 58 mm

Potatoes: 49 mm

Droughtiness Grade: 1 (Calculated to 120 cm)

Final ALC Grade: 3a

Main Limiting Factor(s): Wetness

Remarks:

SITE NAME	PROFILE NO.	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
Failand Farm	Pit 2	3° N	Maize	Av Rainfall: 894 mm ATO: 1400 day °C	Lower Limestone Shale
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY	FC Days: 197 Climatic Grade: 1 Exposure Grade: 1	SOIL SAMPLE REFERENCES
115/94	20/10/94	ASP 13	H Lloyd-Jones and N A Done		HLJ/78

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	28	MSL	10YR34	2% SLST	-	-	-	-	-	G	Common f+vf	-	Clear/wavy
2	120	SCL Variable clay + sand content	25Y52	25% >2cm 13% <2cm 38% SLST	cdom 10YR58	-	Weak structure determined by stones	Firm	M	P	Few fine	-	

Profile Gleyed From: 28

Depth to Slowly Permeable Horizon: -

Wetness Class: II

Wetness Grade: 2

VP336-14

Available Water	Wheat:	125 mm
	Potatoes:	95 mm
Moisture Deficit	Wheat:	80 mm
	Potatoes:	66 mm
Moisture Balance	Wheat:	+45 mm
	Potatoes:	+29 mm
Droughtiness Grade:		1 (Calculated to 120 cm)

Final ALC Grade: 2

Main Limiting Factor(s): Wetness

Remarks:

Pit dug to 80 cm.

SITE NAME	PROFILE NO.	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
Failand Farm	Pit 3	2° W	P Pasture	Av Rainfall: 894 mm ATO: 1400 day °C FC Days: 197 Climatic Grade: 1 Exposure Grade: 1	Ashy Limestone + Tuffs
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY		SOIL SAMPLE REFERENCES
115/94	20/10/94	nr ASP 5	N A Done		NAD/150

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	FSL	10YR44	7% SLST Vis est	-	-	-	-	-	-	Many f+vf	-	Gradual/ smooth
2	65	HCL	75YR44	-	-	-	MDCP	Friable	M	VG	Common fine	-	Clear/ smooth
3	120	SCL	75YR43	10% SLST Vis est	ffom 75YR46	Common	WDCSAB	Friable	M	P	Common fine	-	

Profile Gleyed From: -

Depth to Slowly Permeable Horizon: -

Wetness Class: I

Wetness Grade: 1

VP336-14

Available Water Wheat: 149 mm

Potatoes: 114 mm

Moisture Deficit Wheat: 80 mm

Potatoes: 66 mm

Moisture Balance Wheat: 69 mm

Potatoes: 48 mm

Droughtiness Grade: 1 (Calculated to 120 cm)

Final ALC Grade: 1

Main Limiting Factor(s):

Remarks:

Pit dug to 80 cm.

SITE NAME	PROFILE NO.	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
Failand Farm	Pit 4	3° N	P Pasture	Av Rainfall: 894 mm ATO: 1400 day °C FC Days: 197 Climatic Grade: 1 Exposure Grade: 1	Black Rock Limestone
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY		SOIL SAMPLE REFERENCES
115/94	20/10/94	ASP 44	P Barnett and N A Done		NAD/151

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	MSZL + MZCL	75YR43	7% HR	-	-	-	-	-	G	Many f+vf	-	Gradual/ smooth
2	40	HCL	75YR66	5% HR	fffom	None	MCSAB	Fr	M	G	Common f+vf	-	Gradual/ smooth
3	120	C +MSL pocket	25Y34 75YR54	10% HR	cdom 75YR58	Common	WDCSAB	Fr	M	G	Few fine	-	

Profile Gleyed From: Within 40 cm

Depth to Slowly Permeable Horizon: -

Wetness Class: II

Wetness Grade: 3a

VP336-14

Available Water Wheat: 130 mm

Potatoes: 109 mm

Moisture Deficit Wheat: 80 mm

Potatoes: 66 mm

Moisture Balance Wheat: 50 mm

Potatoes: 43 mm

Droughtiness Grade: 1 (Calculated to 120 cm)

Final ALC Grade: 3a

Main Limiting Factor(s): Wetness

Remarks:

Very variable subsoils with some clay and sandy pockets.