98/98

BRIXTON - YEALMPTON SOUTH

8FCS 6484B

AGRICULTURAL LAND CLASSIFICATION SURVEY

CONTENTS

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AGRICULTURAL LAND CLASSIFICATION SURVEY

INTRODUCTION

1. This report presents the findings of a semi-detailed Agricultural Land Classification (ALC) survey of 511 ha of land in two sites south of Brixham and south of Yealmpton, Devon. Field survey was based on 190 auger borings and 6 soil profile pits, and was completed in December 1999. During the survey 13 examples were analysed for particle size and distribution (PSD).

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 South Hams Local Plan.

3. Information on climate, geology and soils, and from previous ALC surveys was considered and is presented in the relevant section. 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.

SUMMARY

4. The distribution of ALC grades is shown on the accompanying 1: 15 000 scale ALC maps. 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 the tables below.

Table 1: Distribution of ALC grades: Brixton South

Grade	Area (ha)	% Surveyed Area (102.1ha)
3a	63.6	62
3b	32.7	32
4	5.8	6
Agricultural land not surveyed	0.3	
Other land	41.9	
Total site area	144.3	

5. This shows that 62% of the area surveyed was found to be best and most versatile, Subgrade 3a limited mainly by restricted workability and occasionally by wetness. The rest of the area was found to be mainly Subgrade 3b limited mainly by gradient and wetness, occasionally by restricted workability and with smaller areas of Grade 4 limited by gradient.

Table 2: Distribution of ALC grades: Yealmpton South

Grade	Area (ha)	% Surveyed Area (195.4 ha)
3a	125.9	64
3b	41.9	21
4	27.6	14
Other land	171.8	
Total site area	367.2	

6. This shows that 64% of the area was found to be best and most versatile, Subgrade 3a limited mainly by restricted workability. The remaining land was mainly Subgrade 3b limited by restricted workability, wetness and gradient with smaller areas of Grade 4 limited by wetness and gradient.

CLIMATE

7. Estimates of climatic variables for each 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 sites are given in the relevant section.

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 at Tables 3 and 4 indicate that there is no overall climatic limitation except for the south east corner of the Yealmpton site which has an overall climatic limitation to Grade 2 above approximately the 65m contour.

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. A critical boundary of 225 FC Days was found in the extreme south east corner of the Yealmpton site where it appears to follow the 65m contour.

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10. Apart from the published regional ALC map (MAFF, 1977), which shows the site at a reconnaissance scale as Grades 2 and 3, the site had been previously surveyed in 1975 to the guidelines for classification in force at that time and this survey also shows Grade 2 through the centre of the site with Subgrade 3a and 3b at each side (ADAS, 1975).

Climate

11. The following data is taken to represent the site.

Table 3: Climatic Interpolations: Brixton South

Grid Reference		SX 542517	SX 549515	SX 555521
Altitude (m)		20	55	40
Accumulated Temperature (day °C)		1604	1564	1581
Average Annual Rainfall (mm)		1058	1142	1130
Overall Climatic Grade		1	1	1
Field Capacity Days		211	223	223
Moisture deficit (mm):	Wheat	100	90	93
	Potatoes	92	80	84

Relief

12. Altitude ranges from sea level to 58 metres in the centre of the site with mainly gentle and moderate slopes which are not limiting but also with smaller areas of strong and moderately steep slopes which limit the grade of the land to Subgrade 3b and to Grade 4, particularly in the west of the site.

Geology and Soils

13. The underlying geology of the site is shown on the published geology map (IGS, 1974) as mainly Middle Devonian slates, with small areas of igneous schalsteins and tuffs and small patches of alluvium in the main river valleys. This was largely borne out by the current ALC survey although this also found considerable variation in the parent material ranging from shallow soils over slate bedrock to more deeply weathered slate head giving rise to clay subsoil with impeded drainage.

14. Soils were mapped by the Soil Survey of England and Wales at a reconnaissance scale of 1:250 000 (SSEW, 1983) as Denbigh 1 Association. This is described as comprising well drained fine loamy and fine silty soils over Palaeozoic slaty mudstone and siltstone with some similar soils having slowly permeable subsoils and slight seasonal waterlogging. This broad description was generally borne out by the current ALC survey although the published soils information gives little indication of the range of topsoil texture and particularly wetness which are critical to ALC grade. The ALC survey also found several borings and even groups of borings with clay topsoil texture which would not have been expected from the published soils information.

Agricultural Land Classification

15. The distribution of ALC grades found by the current survey is shown on the accompanying 1: 15 000 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. The area shown as Subgrade 3a was found to be mainly limited by restricted workability with heavy clay loam topsoil at Wetness Class I (See Appendix II). The shallower and stonier phases of this type of profile are illustrated by Pit 1 at the Yealmpton South site and by Pit 2 at this site. These show that even where auger borings proved to be impenetrable, there is normally sufficient soil material for the profile to be assessed as no worse than droughtiness Subgrade 3a. However, small areas of shallow and stony soils may exist within the areas shown as Subgrade 3a, such as were found at ASP 6, considered to be limited by droughtiness to Subgrade 3b and ASP 28F which was found to be limited to Subgrade 3b by restricted soil depth.

17. Other isolated borings such as ASPs 10 and 70 were found to be limited to Subgrade 3a by wetness with heavy clay loam topsoil at Wetness Class II, as indicated by gleying within the lower subsoil.

18. The area shown as Subgrade 3a may also include small areas with clay topsoil texture where the clay content of the topsoil exceeds 35%, such as at ASP 31.

Subgrade 3b

19. The area shown as Subgrade 3b includes several areas found to have clay topsoil texture such as around ASPs 13, 14, 22 and 23 and also ASP 35. These were all found to be Wetness Class I, but limited to Subgrade 3b by restricted workability because of the clay topsoil.

20. Much of the area shown as Subgrade 3b, particularly on the somewhat steeper valley sides found in the west and in the east of the site, are limited by gradient.

21. A significantly large area in the centre of the site was found to be Subgrade 3b with heavy clay loam topsoil mainly at Wetness Class III with gleying evident below 40 cm and a slowly permeable layer in the lower subsoil. These conditions are illustrated by Pit 1.

Grade 4

22. The several small areas shown as Grade 4 are all limited by gradient, with slopes of 12 - 18°.

Other Land

23. Other land which was not surveyed includes mainly residential land in the village of Brixton, woodland, roads and a disused railway. A short length of this railway near ASP 1 has been grassed over successfully and has been included within the surrounding area of Subgrade 3a.

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24. The published regional ALC map (MAFF 1977) shows the site at a reconnaissance scale as mainly Grades 2 and 3 with smaller areas of Grade 4 mainly along the river valleys. Part of the site, the area to the north of the River Yealm, had been previously surveyed in 1975 (ADAS 1975) and this survey also shows Grade 2 to the west of the village with mainly Subgrade 3b including some of the more level fields to the south of Kitley House, but this survey was carried out to guidelines for classification which has now been superseded.

25. More recent ALC surveys have been carried out on land to the north of the main A379 road (Brixton to Modbury, ADAS 1998) and these surveys found grades similar to and contiguous with the current survey.

Climate

26. The following data is taken to represent the site.

Table 4: Climatic Interpolations: Yealmpton South

Grid Reference		SX 559512	SX 567507	SX 589512
Altitude (m)		35	40	65
Accumulated Temperature (day °C)		1587	1581	1552
Average Annual Rainfall (mm)		1107	1112	1140
Overall Climatic Grade		1	1	1
Field Capacity Days		219	220	225
Moisture deficit (mm):	Wheat	95	95	90
	Potatoes	87	86	80

27. Although most of the site lies below the 225 FC Day boundary, the extreme south east corner of the site appears to experience more than 225 FC days with the boundary running approximately along the 65 m contour. This distinction is crucial to the determination of ALC wetness grade from Table 6 of the published criteria. The same corner of the site, possibly above the 70 m contour also has an overall climatic limitation to Grade 2 although this was nowhere found to be the primary limitation.

28. A minor limitation due to topographic exposure was considered to exist on the highest land in the south east corner of the site and also possibly on the promontory to the south of Kitley House. In these areas, exposure would limit the grade of the land to Grade 2 or possibly Subgrade 3a but nowhere would this be the primary limitation.

Relief

29. Altitude ranges from sea level to 105 m above Higher Dunstone Farm in the south east corner of the site. Over most of the site slopes are gentle to moderate and are not limiting although significant areas of strongly sloping land are found facing south over the estuary and strong or even moderately steep slopes are found on lower hill slopes with a northerly aspect in the south of the site.

30. Narrow areas of floodplain in the valley of the River Yealm are considered on the basis of the reports of local knowledge to carry a significant risk of flooding although this would nowhere be the primary limitation and the flood risk was not investigated in detail. Indeed, during this ALC survey the area around ASP 10, 11 and 12 was under survey for flood alleviation works.

Geology & Soils

31. The underlying geology of the site is shown on published geology map (IGS 1974) as mainly Devonian limestone around the east and south sides of the village with mainly Middle Devonian slates elsewhere overlain by alluvium and river gravel in the main river valleys. A small area of slates and grit of the Meadfoot Group is shown in the extreme south east corner of the site. This distribution was largely borne out by the current ALC survey. The occurrence of limestone parent material is of particular significance to the ALC as the topsoil in these areas was found to be noticeably heavier, frequently clay and this implies further restriction to ALC grade. However, the area shown as Middle Devonian slate was found to be variable in depth and also in topsoil texture with clay topsoils found particularly in the area to the south west of Puslinch Farm.

32. Soils were mapped by the soil survey of England and Wales at a reconnaissance scale of 1: 250 000 (SSEW 1983) as Denbigh 1 Association. This is described as comprising well drained fine loamy and fine silty soils over Palaeozoic slaty mudstone and siltstone, with some similar soils having slowly permeable subsoils and slight seasonal waterlogging. Clearly this gives no indication of the distribution of the variety of soils found in this area by the ALC survey.

Agricultural Land Classification

33. The distribution of ALC grades found by the current survey is shown on the accompanying 1: 15 000 scale map and areas are summarised in Table 2. 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

34. The area shown as Subgrade 3a was found to be mainly limited by restricted workability with heavy clay loam topsoils at Wetness Class I. Several borings, particularly to the south of Kitley House found shallow soil profiles with slate bedrock evident in the middle or upper subsoil. Such profiles were investigated by Pit 1 at this site and Pit 2 at the Brixton South site and these showed that soil depth and particularly droughtiness are unlikely to be

worse than Subgrade 3a, although the possibility of shallow profiles in very small areas cannot be ruled out and perhaps ASP 86 is an example of this.

35. The area shown as Subgrade 3a includes soils to the east and south of the village which are underlain by deposits of limestone, where heavy clay loam topsoil textures were confirmed by several PSD samples. These are illustrated by Pit 3 where the topsoil texture was proved to be medium clay loam, indicating an isolated observation of Grade 2 at Wetness Class II.

36. Further away from the crests of hills, profiles became deeper and Pit 2 illustrates a deep profile at Wetness Class I and with only minor stone content.

37. Individual scattered borings of Subgrade 3a are found within the area shown as Subgrade 3b although they do not appear to constitute a robust and homogeneous mapping unit.

Subgrade 3b

38. The area of Subgrade 3b shown in the extreme south east of the site has soil profiles similar to those described above, but lies above the 225 FC day boundary.

39. Much of the remaining area shown as Subgrade 3b was found to have a primary limitation due to gradient, although the soil profiles were generally found to be similar to those described above for Subgrade 3a.

Grade 4

40. Much of the area shown as Grade 4 in the south of the site was found to be limited by gradient with slopes of 12-18 degrees, but there is also a band of Grade 4 limited by wetness at the foot of these slopes, particularly to the south of Higher Torr Farm. Observations in this area found gleying above 40 cm and a slowly permeable layer starting in the middle or upper subsoil.

41. Other small areas of Grade 4, particularly in the lower floodplain of the River Yealm were found to be limited by wetness which may be due to groundwater alone. These areas were also liable to frequent flooding although this would not be the primary ALC limitation.

Other Land

42. Much of the area shown as other land comprises the village of Yealmpton, the National Shire Horse Centre at Dunstone and the abundant scattered woodland of the Kitley Estate, as well as scattered quarries and several roads. The area around ASP 139 and 140 was found to comprise estuarine saltings which are shown as non agricultural although the small area around ASP 140 was fenced for occasional summer grazing. The area to the south and west of Kitley House, now a hotel and restaurant, was found to be open grassland but with no provision for grazing and was considered to be amenity grassland associated with the hotel. Around the site there are several other significant areas of amenity grassland associated with large houses which appear to have no provision for grazing and therefore have been shown as non-agricultural.

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1 February 1999

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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
Yealmpton South	Pit 1 (Nr Asp 86)	0°	Cereals	Av Rainfall: 1107 mm ATO: 1587 day °C	Slate
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY	FC Days: 219 Climatic Grade: 1 Exposure Grade: 1	PSD SAMPLES TAKEN
98.98	23.12.98	SX 5590 5121	PB		TS 0-25 cm: HCL (S46:Z27:C27%)

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	HCL	10YR43	2%> 2 cm (s) 14%< 2 cm (s+d) 16% HR, ZR	0	0	-	-	-	-	CF,VF	-	Clear Smooth
2	35	HCL	10YR44	4%> 2 cm (s) 30%< 2 cm (s+d) 34% ZR, HR	0	0	WKFSAB	FR	G	G	FF,VF	-	Clear Smooth
3	55	HCL	10YR54	5%> 2 cm (s) 50%<2 cm (s+d) 55%ZR	0	0	Too stony	-	(M)	(G)	FVF	-	Clear Irregular
4	65+	HCL	10YR63	85%ZR (vis)	0	0	Too stony	-	(M)	(G)	0	-	

Profile Gleyed From: -

Slowly Permeable Horizon From: -

Wetness Class: I

Wetness Grade: 3a

Available Water Wheat: 99 mm

Potatoes: 90 mm

Moisture Deficit Wheat: 95 mm

Potatoes: 87 mm

Moisture Balance Wheat: +4 mm

Potatoes: +3 mm

Droughtiness Grade: 3a (Calculated to 100 cm)

Final ALC Grade: 3a

Main Limiting Factor(s): Wk, Dr

Remarks: Pit dug to 65 cm, probed to 80 cm. Stone contents distorted by breakage of fragments during excavation.

SITE NAME	PROFILE NO.	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
Yealmpton South	Pit 2 (Asp 66)	3° W	PGR	Av Rainfall: 1107 mm ATO: 1587 day °C	Slate/Igneous tuffs etc
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY	FC Days: 219 Climatic Grade: 1 Exposure Grade: 1	PSD SAMPLES TAKEN
98.98	23.12.98	SX 5662 5140	PB		TS 0-25 cm: HCL (S33:Z37:C30%)

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	HCL	10YR44	2% HR (vis)	0	0	-	-	-	-	MF,VF	-	Grad Smooth
2	65	HCL	7.5YR46	10%HR(vis)	0	0	MDC,FSAB	FR	M	G	CF,VF	-	Grad Smooth
3	85	C	7.5YR54	10%HR (vis)	0	0	MDM,FSAB	FR	G	G	FVF	-	Clear Smooth
4	98+	C	10YR74,64	10%HR (vis)	CDFO 10YR56	0	WKCSAB	FM	M	G	0	-	

Profile Gleyed From: 85 cm

Slowly Permeable Horizon From: -

Wetness Class: I

Wetness Grade: 3a

Available Water Wheat: 148 mm

Potatoes: 113 mm

Moisture Deficit Wheat: 95 mm

Potatoes: 87 mm

Moisture Balance Wheat: +53 mm

Potatoes: +26 mm

Droughtiness Grade: 1 (Calculated to 120 cm)

Final ALC Grade: 3a

Main Limiting Factor(s): Wk

Remarks:

SITE NAME	PROFILE NO.	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
Yealmpton South	Pit 3 (Asp 54)	4° N	PGR	Av Rainfall: 1100 mm ATO: 1550 day °C	Devonian limestone
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY	FC Days: 218 Climatic Grade: 1 Exposure Grade: 1	PSD SAMPLES TAKEN
98.98	23.12.98	SX 5842 5149	PB		TS 0-25 cm: MCL (S29:Z46:C25%)

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	MCL	10YR44	5%HR (vis)	0	0	-	-	-	-	MF,VF	-	Grad Smooth
2	46	MCL	7.5YR46	5%HR (vis)	0	0	MDFSAB	FR	G	G	CF,VF	-	Clear Smooth
3	80+	C	10YR64	10%HR(vis)	0	0	WKCSAB	FM	M	G	FF,VF	-	

Profile Gleyed From: -

Slowly Permeable Horizon From: -

Wetness Class: I

Wetness Grade: 2

Available Water Wheat: 127 mm

Potatoes: 119 mm

Moisture Deficit Wheat: 95 mm

Potatoes: 90 mm

Moisture Balance Wheat: +31 mm

Potatoes: +29 mm

Droughtiness Grade: 1 (Calculated to 100 cm)

Final ALC Grade: 2

Main Limiting Factor(s): Wk

Remarks: Depth of profile to hard limestone variable: 100 cm at this point.

SITE NAME	PROFILE NO.	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
Yealmpton South	Pit 4 (Asp 106)	2 ° N	PGR	Av Rainfall: 1100 mm ATO: 1550 day °C	Slate head
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY	FC Days: 220 Climatic Grade: 1 Exposure Grade: 1	PSD SAMPLES TAKEN
98.98	23.12.98	SX 58735126	PB		TS 0-25 cm: HCL (S29:Z41:C30%)

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	22	HCL	10YR44	10%HR(vis)	0	0	-	-	-	-	MF,VF	-	Clear Smooth
2	46	HCL	7.5YR46	15%HR (vis)	0	0	WKM,FSAB	FR	G	G	CF,VF	-	Clear Smooth
3	55	C	10YR64	20%HR,ZR (vis)	0	0	WKCSAB	FR	M	G	FVF	-	Clear Smooth
4	70	C	10YR63	20%HR,ZR (vis)	CDFO 10YR56	C	WKCSAB	FM	P	G	FVF	-	Grad Smooth
5	90+	C	10YR73	20%HR,ZR (vis)	MDFO 10YR58	C	WKCSAB	FM	P	P	0	-	

Profile Gleyed From: 55 cm

Slowly Permeable Horizon From: 70 cm

Wetness Class: III

Wetness Grade: 3b

Available Water Wheat: 125 mm

Potatoes: 107 mm

Moisture Deficit Wheat: 90 mm

Potatoes: 80 mm

Moisture Balance Wheat: +35 mm

Potatoes: +27 mm

Droughtiness Grade: 1 (Calculated to 120 cm)

Final ALC Grade: 3b

Main Limiting Factor(s): We

Remarks: