Stanton Fitzwarren

Agricultural Land Classification

December 1996

Resource Planning Team
Taunton Statutory Group
ADAS Bristol

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STANTON FITZWARREN

AGRICULTURAL LAND CLASSIFICATION SURVEY

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STANTON FITZWARREN

AGRICULTURAL LAND CLASSIFICATION SURVEY

INTRODUCTION

1. This report presents the findings of a reconnaissance Agricultural Land Classification (ALC) survey of 766 ha of land at Stanton Fitzwarren. Field survey was based on 293 auger borings and 8 soil profile pits, and was completed in December 1996.

2. The survey was conducted by the Resource Planning Team of ADAS Taunton Statutory Group on behalf of MAFF Land Use Planning Unit in its statutory role in the preparation of the Wiltshire Structure 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 largely Grade 3; the valley as Grade 4 and an area of Grade 2 at Red Down, the site had not been surveyed previously. However, 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. Account has been taken of the findings of adjacent surveys tot he south-east (ADAS; 1995, 1996).

5. At the time of survey land cover was arable and grazing pasture. An areas of 13 ha of agricultural land within the survey area was not surveyed. At Red Down, access was not granted. The land around Park Farm now forms a country park and the land south of Kingsdown Lane is owned by the Woodland Trust who were in the process of planting trees.. Other land which was not surveyed included woodland and urban areas.

SUMMARY

6. The distribution of ALC grades is shown on the accompanying 1:25 000 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 the Table 1.

Table 1: Distribution of ALC grades: Stanton Fitzwarren

Grade	Area (ha)	% Surveyed Area (545 ha)
2	2	<1
3a	269	49
3b	274	51
Agricultural land not surveyed	13	
Other land	208	
Total site area	766	

7. The soils found are closely linked to the geology. The majority of soils developed over Coral Rag are mapped as Subgrade 3a with a moderate droughtiness limitation. Where the soils are stonier then the droughtiness limitation is worse and these are mapped as Subgrade 3b, such as south east of Stanton Fitzwarren and at Stubbs Hill. Poorly drained clay soils are found in the valleys and these are mapped as Subgrade 3b with a moderate wetness limitation. Other areas of Grade 2 and Subgrade 3a are found where soils are lighter textured and better drained.

CLIMATE

8. 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 a key point around the site are given in Table 2 below.

9. 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..

10. 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: Stanton Fitzwarren

Grid Reference		SU197 900
Altitude (m)		125
Accumulated Temperature (day °C)		1385
Average Annual Rainfall (mm)		695
Overall Climatic Grade		1
Field Capacity Days		153
Moisture deficit (mm):	Wheat	101
	Potatoes	91

RELIEF

11. Altitude ranges from 91 metres at Swanborough to 145 metres at Broad Blunsdon. The site represents a dissected plateau with a series of valleys cut into it on the northern side. Nowhere were valley side slopes found to be limiting to agriculture. The plateau areas are gently undulating.

GEOLOGY AND SOILS

12. The underlying geology of the site is shown on the published geology map (IGS,1974). The higher land is mapped as Coral Rag with fringes of silt and sand, which are all from the Upper Jurassic Era. Oxford clay is found in the valleys with recent alluvium along the water courses. There are patches of Red Down Sand and Clay in the east and west. The pattern of soils found in the recent survey is related to the mapped geology with stony soils developed over the Coral Rag and poorly drained soils in the valleys. The sand and silt gives rise to more variable soils.

13. Soils were mapped by the Soil Survey of England and Wales at a reconnaissance scale of 1:250 000 (SSEW, 1983). Much of the site is mapped as Sherborne Association corresponding to the underlying Coral Rag. Associated with this are bands of Evesham 2 Association running south through Stanton Fitzwarren and along the Northwest edge of the site following the underlying Oxford Clay. Around Oxleaze Farm, a small patch of Denchworth Association is mapped and a small area of Fyfield 4 is mapped at Red Down.

14. Evesham 2 Association is described as slowly permeable calcareous clayey soils with some slowly permeable seasonally water logged non calcareous clayey and silty soils. Denchworth soils are similar but not usually calcareous. The Sherborne Association describes shallow well drained brashy calcareous clayey soils. Fyfield 4 is also described as well drained but coarse loamy or sandy soils.

15. The mapped soils are closely linked to the underlying geology. As indicated above, the soils found in the recent survey follow its pattern. Soils were found similar to the mapped associations, but the greater detail afforded by the geology map explains the soil types found over the silt and sand which the soil association map does not identify. The boundaries of the soils found tie in well with the geology map whereas the soils map generalises the boundaries too much.

AGRICULTURAL LAND CLASSIFICATION

16. The distribution of ALC grades found by the current survey is shown on the accompanying 1:25 000 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.

Grade 2

17. Two small areas of Grade 2 have been mapped. The boundaries are closely linked with geological boundaries. At Red Down, an area of Red Down Sand is mapped and light textured sandy and clay loam soils were identified. These soils are well drained, Wetness Class I (see Appendix II), with a mix of minor workability and droughtiness limitations. In the south-east, a small area of Grade 2 is mapped based on evidence from the adjacent site (ADAS, 1995) and mapped geology.

Subgrade 3a

18. Soils developed over Coral Rag are stony clays. The clay soils become impenetrable to the auger at variable depths and soils pits are required to accurately assess the extent of a droughtiness limitation. Coral Rag is a limestone which appears to be variable in hardness. Whilst in places at this site the available water in the limestone could be taken as that listed for soft oolitic or dolomitic limestone (MAFF, 1988), at the generalised Scale of Survey and mapping, the more severe option of hard rock has been used in assessing the extent of droughtiness at this site. It is recognised that this assessment will be too severe in places, but a more detailed survey with more soil pits would be needed to distinguish locations. Soils developed over Coral Rag are typically increasingly stony with depth. At this site, the stone was found to be well fractured and often weathered into fragments. Root penetration observed deep into the profile indicates that plants can exploit moisture reserves in these stony soils and this evidence has been used in the droughtiness assessment.

19. Several areas of stony soils over Coral Rag have been mapped as Subgrade 3a. Soil profile pits 6, 7, and 8 showed that the soils had a moderate droughtiness and workability limitation. Stone contents were assessed by sieving and displacement and showed total topsoil stones to be 10-16% in these pits. Subsoil stones were measured as 20-59%. The soils were assessed as Wetness Class I. Pit 8 represents a small area of stony soils at Red Down. Pits 6 and 7 represent soils developed over mapped Coral Rag to the west of Stanton Fitzwarren extending to the A419 at Hyde and Blunsdon. The area of Subgrade 3a at Catsbrain Farm is linked to similar soils on the adjacent site mapped in 1995 (ADAS, 1995).

20. The other areas of Subgrade 3a are mapped where soils have developed over Lower Corallian sand and silt. In places, this gives rise to well drained soils which can be distinguished, but in others, poorly drained soils which are similar to soils developed over the clays. The better drained soils have been mapped as Subgrade 3a. East of Stanton Fitzwarren lighter textured soils are found. Soil profile Pit 1 describes sandier soils which are Wetness Class I and have a moderate workability limitation with clay topsoils over sandy loam and loamy sand subsoils. Also in this area, Wetness Class II soils with heavy clay loam topsoils and Wetness Class I clay profiles are found. Similar soils are found around Ash Covert west of Oxleaze Farm.

21. West of Stanton Fitzwarren, some Wetness Class I , Grade 2 profiles with heavy clay loam topsoils are included in an area of Subgrade 3a. Pit 4 in this area describes the other soils which have heavy clay loam topsoils over clays and are Wetness Class II.

Subgrade 3b

22. Two soil types have been mapped as Subgrade 3b. More stony soils developed over Coral Rag have a greater droughtiness limitation and are downgraded to Subgrade 3b. Such soils are found to the south east of Stanton Fitzwarren and are described by Pit 2. This showed the total stone content in the topsoil to be 12% rising to 74% by 50cm. This reduces the available water for crop growth and imposes a moderate droughtiness limitation. Similar stony soils were found at Stubbs Hill. Here, Pit 5 showed that in places the Coral Rag is less fractured and much shallower soils exist. This imposed a severe droughtiness limitation at the pit site but deeper soils were found in the area so, at the scale of mapping this area is mapped as Subgrade 3b.

23. In the valleys developed over the clays, poorly drained clay soils are found. These are assessed as Wetness Class IV with a moderate wetness limitation. The soils are gleyed either from the surface or in the upper subsoils and the subsoils are slowly permeable. Occasional poorly drained stony soils were identified around the survey area and these are also mapped as Subgrade 3b.

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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 (In preparation) Soil Survey Field Handbook, Revised Edition.

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, 1974).

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	**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%			

STRUCTURE: Ped Development *

WA:	Weakly adherent	**M:**	Moderately developed
W:	Weakly developed	**S:**	Strongly developed

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, 1974) for details.

SITE NAME	PROFILE NO.	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
Stanton Fitzwarren	Pit 1 (near ASP 75)	2° North East	PGR (Field Strip)	Av Rainfall: 695 mm ATO: 1385 day °C	Silt and sand
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY	FC Days: 153 Climatic Grade: 1 Exposure Grade: 1	SOIL SAMPLE REFERENCES
32/96	4/12/96	SU18649070	HLJ/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	22	C	10YR43	1% HR (Vis)	None	None	—	—	—	—	CF & VF	—	Gradual Smooth
2	63	MSL	10YR56 patches of 10YR74 7.5YR56	None	None	None	WCAB	V. Friable	Good	Good	FVF	—	Clear Wavy
3	90+	LMS	10YR68 10YR84 10YR76	None	None	None	WCSAB	V. Friable	Mod	Good	FVF	—	—

Profile Gleyed From: Not Gleyed

Depth to Slowly Permeable Horizon: No SPL

Wetness Class: I

Wetness Grade: 3a

Available Water Wheat: 129

Potatoes: 112

Moisture Deficit Wheat: 101

Potatoes: 91m

Moisture Balance Wheat: 28mm

Potatoes: 21m

Droughtiness Grade: 2 (Calculated to 120)

Final ALC Grade: 3a

Main Limiting Factor(s): Workability

Remarks: H3 colour variation may be due to wetness, but not significant. Although pit not like surrounding borings, it represents the transition between Coral Rag and Denchworth soils.

SITE NAME	PROFILE NO.	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
Stanton Fitzwarren	Pit 2 (Nr ASP 119)	1° South	PGR (set aside headland)	Av Rainfall: 695 mm ATO: 1385 day °C	Coral Rag
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY	FC Days: 153 Climatic Grade: 1 Exposure Grade: 1	SOIL SAMPLE REFERENCES
32/96	4/12/96	SU18279030	GMS/HLJ		____

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	C	10YR42	2%HR (S) > 2cm 10% HR (vis) > 2mm 12% HR Total	None	None	—	—	—	—	CVF	—	Clear Smooth
2	50	C	10YR54	40% HR >2cm 14% HR >2mm 54% HR Total	None	None	WM, FSAB	Friable	Good	Well Fissured	CVF	—	Gradual Smooth
3	70+	C	10YR64	60% HR > 2cm 14% HR > 2mm 54% HR Total	None	None	—	—	(moderate)	Well Fissured	FVF	—	

Profile Gleyed From: Not Gleyed

Depth to Slowly Permeable Horizon: No SPL

Wetness Class: I

Wetness Grade: 3a

Available Water Wheat: 70 mm

Potatoes: 70 mm

Moisture Deficit Wheat: 101 mm

Potatoes: 91 mm

Moisture Balance Wheat: -31 mm

Potatoes: -21 mm

(Calculated to 100 cm)

Droughtiness Grade: 3b

Final ALC Grade: 3b

Main Limiting Factor(s): Droughtiness

Remarks: Decrease in roots at boundary of H2 & 3

SITE NAME	PROFILE NO.	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
Stanton Fitzwarren	Pit 3 (nr ASP 19)	0°	Grass Strip in arable	Av Rainfall: 695 mm ATO: 1385 day °C	Oxford clay
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY	FC Days: 153 Climatic Grade: 1 Exposure Grade: 1	SOIL SAMPLE REFERENCES
32/96	5/12/96	SU18069116	HLJ/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	12	C	10YR41	None	CRRC	None	—	—	—	—	CF & VF	—	Clear Smooth
2	35	C	25Y52	< 1% HR (Vis)	CDFO (10YR56)	None	WCSAB (MMAB)	Firm	Poor	Poor	FVF	—	Gradual Smooth
3	65+	C	2.5Y52	None	MDFO (10YR56)	Few	WCSAB* (MMAB)	Firm	Poor	Poor	FVF	—	—

Profile Gleyed From: 12cm

Depth to Slowly Permeable Horizon: 12cm

Wetness Class: IV

Wetness Grade: 3b

Available Water Wheat: 119 mm

Potatoes: 96 mm

Moisture Deficit Wheat: 101 mm

Potatoes: 91 mm

Moisture Balance Wheat: 18 mm

Potatoes: 5 mm

Droughtiness Grade: 2 (Calculated to 120 cm)

Final ALC Grade: 3b

Main Limiting Factor(s): Wetness

Remarks: * Weaker than H2

SITE NAME	PROFILE NO.	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
Stanton Fitzwarren	Pit 4 (ASP 130)	1° East	Permanent Grass	Av Rainfall: 695 mm ATO: 1385 day °C	Sand and silt
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY	FC Days: 153 Climatic Grade: 1 Exposure Grade: 1	SOIL SAMPLE REFERENCES
32/96	4/12/96	SU17449026	GMS/HLJ		32/96/4

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	10YR32	None	None	None	—	—	—	—	MF & VF	—	Clear Smooth
2	60	C	10YR42	None*	None	None	MCSAB	Friable	Moderate	Good	FVF	—	Gradual Wavy
3	75	HZCL	2.5Y51	None	CDFO (10YR56)	None	WMSAB	V Friable	Good	Good**	FVF	—	Clear Smooth
4	90+	C	2.5Y61	None	CDMO (10YR56)	None	WACSAB	Firm	Poor	Poor	FVF	—	—

Profile Gleyed From: 60cm

Depth to Slowly Permeable Horizon: 75cm

Wetness Class: II

Wetness Grade: 3a

Available Water Wheat: 144 mm

Potatoes: 124 mm

Moisture Deficit Wheat: 101 mm

Potatoes: 91 mm

Moisture Balance Wheat: 43 mm

Potatoes: 33 mm

Droughtiness Grade: 1 (Calculated to 120 cm)

Final ALC Grade: 3a

Main Limiting Factor(s): Wetness

Remarks:
* Very weathered, soft, pale/white deposit of limestone
** Low pores but good drainage. Water coming in below it.

SITE NAME	PROFILE NO.	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
Stanton Fitzwarren	Pit 5 (ASP 80)	3° North East	Game cover/bare	Av Rainfall: 695 mm ATO: 1385 day °C	Coral Rag
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY	FC Days: 153 Climatic Grade: 1	SOIL SAMPLE REFERENCES
32/96	5/12/96	SU16059046	GMS/HLJ	Exposure Grade: 1	———

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	20	C	10YR42	1% HR >2cm (S) 10% HR > 2mm (Vis) 11% HR Total	None	None	—	—	—	—	FVF	—	Clear Smooth
2	40	C	10YR54	35% HR > 2cm (S) 21% HR > 2mm (S+D) 56% HR Total	None	None	Too Stony	—	Moderate*	Well Fissured	FVF	—	Gradual Smooth
3	50+	C	10YR54	>70% HR (Vis)	None	None	Too Stony	—	Moderate*	Well Fissured	FVF	—	—

Profile Gleyed From: Not Gleyed

Depth to Slowly Permeable Horizon: No SPL

Wetness Class: I

Wetness Grade: 3a

Available Water Wheat: 49 mm

Potatoes: 49mm

Moisture Deficit Wheat: 101 mm

Potatoes: 91 mm

Moisture Balance Wheat: -52 mm

Potatoes: -42 mm

Droughtiness Grade: 4 (Calculated to 80 cm)

Final ALC Grade: 4

Main Limiting Factor(s): Droughtiness

Remarks: Very fine roots seen at 50cm

*Assumed.
Worst case of droughtiness 3b unit

SITE NAME	PROFILE NO.	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
Stanton Fitzwarren	Pit 6 (ASP 106)	2° East	Fallow	Av Rainfall: 695 mm ATO: 1385 day °C	Coral Rag
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY	FC Days: 153 Climatic Grade: 1 Exposure Grade: 1	SOIL SAMPLE REFERENCES
32/96	6/12/96	SU17109025	HLJ/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	23	C	10YR42	1% HR > 2cm (S) 9% HR > 2mm (S+D) 10% HR Total	None	None	—	—	—	Good	CF + VF	—	Abrupt Smooth
2	40	C	10YR54	2% HR > 2cm (S) 18% HR > 2mm (S+D) 20% HR Total	None	None	WC+MSAB	Friable	Moderate	Good	FVF	—	Clear Smooth
3	60	C	10YR64	12% HR > 2cm (S) 36% HR > 2mm (S+D) 48% HR Total	None	None	WMSAB	Firm	Moderate	Well Fissured	FVF	—	Gradual Smooth
4	85+	C	10YR64	20% HR > 2cm (S) 29% HR > 2mm (S+D) 49% HR Total	None	None	WMSAB	Firm	Moderate	Well Fissured	FVF	—	—

Profile Gleyed From: Not Gleyed

Depth to Slowly Permeable Horizon: No SPL

Wetness Class: I

Wetness Grade: 3a

Available Water Wheat: 88 mm

Potatoes: 84 mm

Moisture Deficit Wheat: 101 mm

Potatoes: 91 mm

Moisture Balance Wheat: -13 mm

Potatoes: -7 mm

Droughtiness Grade: 3a (Calculated to 100+ cm)

Final ALC Grade: 3a

Main Limiting Factor(s): Workability

Remarks:

SITE NAME	PROFILE NO.	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
Stanton Fitzwarren	Pit 7 (nr ASP188)	1° North East	OSR	Av Rainfall: 695 mm ATO: 1385 day °C	Coral Rag
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY	FC Days: 153	SOIL SAMPLE REFERENCES
32/96	6/12/96	SU16838960	GMS/HLJ	Climatic Grade: 1 Exposure Grade: 1	____

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	C	10YR42	2% HR > 2cm (S) 14% HR > 2mm (S+D) 16% HR Total	None	None	—	—	—	—	MVF	—	Gradual Wavy*
2	80+	C	2.5Y53 10YR53	15% HR > 2cm (S) 32% HR > 2mm (S+D) 47% HR Total	None	None	WMSAB	Friable	Good	Well Fissured	CVF to 50cm FVF to 80cm	—	—

Profile Gleyed From: Not Gleyed

Depth to Slowly Permeable Horizon: No SPL

Wetness Class: I

Wetness Grade: 3a

Available Water Wheat: 122 mm

Potatoes: 88 mm

Moisture Deficit Wheat: 101 mm

Potatoes: 91 mm

Moisture Balance Wheat: +21 mm

Potatoes: -3 mm

Droughtiness Grade: 2 (Calculated to 120 cm)

Final ALC Grade: 3a

Main Limiting Factor(s): Workability

Remarks: * Depth varied from 20-30cm

SITE NAME	PROFILE NO.	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
Stanton Fitzwarren	Pit 8 (nr ASP 24)	1° North	Cereal	Av Rainfall: 695 mm ATO: 1385 day °C	Coral Rag
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY	FC Days: 153 Climatic Grade: 1 Exposure Grade: 1	SOIL SAMPLE REFERENCES
32/96	6/12/96	SU18859120	GMS/HLJ		_____

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	2% HR >2cm (S) 8% HR > 2mm (Vis) 10% HR Total	None	None	—	—	—	—	MVF	—	Gradual Wavy
2	48	C	10YR53*5	20% HR > 2cm (Vis) 20% HR > 2cm (S) 16% HR > 2mm 56% HR Total	None*4	None	WMSAB*3	Friable	Good	Well Fissured	CVF	—	Gradual Smooth
3	90+	C*	2.5Y52*5	20%SLST Total*2	FFFO (10YR68)	None	MCAB	Firm	Mod	Well Fissured	FVF	—	—

Profile Gleyed From: Not Gleyed

Depth to Slowly Permeable Horizon: No SPL

Wetness Class: I

Wetness Grade: 3a

Available Water Wheat: 109 mm

Potatoes: 89 mm

Moisture Deficit Wheat: 101 mm

Potatoes: 91 mm

Moisture Balance Wheat: +8 mm

Potatoes: -2 mm

Droughtiness Grade: 2 (Calculated to 120 cm)

Final ALC Grade: 3a

Main Limiting Factor(s): Workability

Remarks:
*1 In pockets
*2 Mainly small stones
*3 Determined by stone
*4 Some colour variation but not thought to be mottling
*5 Very variable subsoil colours