8FCS 8188A

Land East of Alvechurch

Agricultural Land Classification

July 1997

Resource Planning Team
Bristol
FRCA Western Region

Job Number 32/97

MAFF Reference EL 17/0089a

LAND EAST OF ALVECHURCH

AGRICULTURAL LAND CLASSIFICATION SURVEY

CONTENTS

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INTRODUCTION

1. This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of 107.1 ha of land east of Alvechurch. Field survey was based on 108 auger borings and 4 soil profile pits, and was completed in June 1997. During the survey 1 sample was analysed for particle size 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 the Bromsgrove District 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 was previously surveyed in 1979 at a scale of 1:25 000 (ADAS, 1979). 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. At the time of survey land cover was grass and cereals. An area of 6.8 ha of agricultural land within the survey area was not surveyed because access could not be obtained. Other land which was not surveyed included residential and commercial buildinges, private gardens, a playing field and cricket ground, woodland, metalled roads and ponds.

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 the Table 1.

Table 1: Distribution of ALC grades: Land East of Alvechurch

Grade	Area (ha)	% Surveyed Area (81.3 ha)
3a	22.2	27.3
3b	37.0	45.5
4	15.3	18.8
Agricultural land not surveyed	6.8	8.4
Other land	25.8	-
Total site area	107.1	100.0

6. The agricultural land across the site, has been graded in the present survey as largely Subgrade 3b, with some Subgrade 3a land and some Grade 4 land. The Subgrade 3a land lies mainly in the west of the site, north of the cricket ground and playing field, and below Mill Farm. A further isolated area of Subgrade 3a land occurs north of Radford Road along the eastern boundary of the site. These soils have moderate limitations to their agricultural use due to soil wetness. The land identified as Grade 4 agricultural land occurs in three isolated areas, one in the central north of the site, north of old Rectory Lane, another east and south of Grassmoor along the eastern boundary of the site and the third in the south of the site bordering the River Arrow. The Grade 4 soils have severe limitations due to soil wetness. The remainder of the site is classified as Subgrade 3b in quality, these soils have moderate limitations again due to soil wetness.

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: Land East of Alvechurch

Grid Reference		ST 032 730
Altitude (m)		117
Accumulated Temperature (day °C)		1361
Average Annual Rainfall (mm)		752
Overall Climatic Grade		1
Field Capacity Days		181
Moisture deficit (mm):	Wheat	90
	Potatoes	77

RELIEF

10. Altitude ranges from 105 metres alongside the River Arrow in the extreme south of the site to 127 metres at the north east corner of the site. The land is gently undulating over the majority of the site with some small areas (north east of Arrow Cottage and south east of the fishponds) exceeding a 7° slope.

GEOLOGY AND SOILS

11. The underlying geology of the site is shown on the published geology map (IGS, 1979) as Triassic Mudstones. The recent survey found the soils across the site to be largely clay loams over red clays.

12. Soils were mapped by the Soil Survey of England and Wales at a reconnaissance scale of 1:250 000 (SSEW, 1983) as Brockhurst 2 Association across the majority of the site with Whimple 3 Association in the south east of the site.

13. The Brockhurst 2 Association is described as having slowly permeable, seasonally waterlogged reddish fine loamy over clayey and clayey soils. The Whimple 3 Association has reddish fine loamy over clayey soils which have slowly permeable subsoils and slight seasonal waterlogging.

AGRICULTURAL LAND CLASSIFICATION

14. 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

15. Three areas of Subgrade 3a, good quality agricultural land, were identified in the present survey. The areas occur north of the cricket ground and playing field; east of Shepherds Croft and South of Mill Farm. The soils have been described as medium clay loam topsoils overlying a heavy clay loam upper subsoil and a clay lower subsoil to depth. Two soil profile pits confirmed the clay as slowly permeable and the soils were asessed as Wetness Class III (See Appendix II).

Subgrade 3b

16. Subgrade 3b quality land occurs over approximately a third of the agricultural land, largely north of the Moat House and Bishops Palace. The soils were found to have clay loam topsoils which overlay clay subsoils to depth. The clay was confirmed as slowly permeable by a soil profile pits and the soils were assessed as Wetness Class IV.

Grade 4

17. The areas of land assessed as Grade 4 in quality occur in the north east and south of the survey area. These soils were found to have heavy clay loam topsoils overlying a slowly permeable clay to depth. These soils were assessed as Wetness Class IV.

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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.

SITE NAME	PROFILE NO.	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
East of Alvechurch	Pit 1 (ASP 98)	3° East	PGR	Av Rainfall: 752 mm ATO: 1361 day °C	Head over Keuper Marl
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY	FC Days: 181 Climatic Grade: 1	PSD SAMPLES TAKEN
32/97	6/6/96	SP 0318 7228	PB	Exposure Grade: 1	H1: M/HCL: S33; Z40; 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	25	MCL/ HCL	10YR52	5% HR (VIS)	None	None	-	-	-	-	MF, VF	-	Abrupt smooth
2	54	HCL	10YR62	10% HR (VIS)	CDFO 10YR56 MDFG 10YR72	Few	WCSAB	Friable	Moderate	Good	MVF	-	Abrupt smooth
3	85+	C	5YR43 (7.5YR56)	20% HR (VIS)	FDF0 7.5YR58	Common	WCPr	Firm	Poor	Poor (low)	CVF	-	-

Profile Gleyed From: 25

Depth to Slowly Permeable Horizon: 54

Wetness Class: III

Wetness Grade: 3a/3b

Available Water Wheat: 120 mm

Potatoes: 102 mm

Moisture Deficit Wheat: 90 mm

Potatoes: 77 mm

Moisture Balance Wheat: +30 mm

Potatoes: +25 mm

Droughtiness Grade: 1 (Calculated to 120 cm)

Final ALC Grade: 3a/3b

Main Limiting Factor(s): Wetness

Remarks: Stones and large pores (<0.5%) make H3 a borderline SPL
3a mapping unit

SITE NAME	PROFILE NO.	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
East of Alvechurch	Pit 2	1°	PGR (ley)	Av Rainfall: mm ATO: day °C	
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY	FC Days: Climatic Grade: Exposure Grade:	PSD SAMPLES TAKEN
32/97	24/6/97		SH/SK		

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	MCL	75YR32	2% HR		-	-	-	-			-	Clear smooth
2	46	HCL	75YR43/ 44 (75YR42)	1-2% HR	mn	-	MDCSB	FM	-	>0.5	C Fine	-	Abrupt smooth
3	58	C	5YR43/44 (5YR42/ 52)	-	C 75YR58	-	CPL, CAB	FM - VM	-	<0.5	C Fine, V Fine	-	Clear smooth
4	80	C	5YR43			-		FM - VM	-	<0.5		-	-

Profile Gleyed From: 46

Depth to Slowly Permeable Horizon: 46

Wetness Class: III

Wetness Grade: 3a
SPL is only 2cm above 3a cut off, so borderline

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:

Main Limiting Factor(s):

Remarks: in H3 clay is weathered mudstone, by 58 in some parts of pit the mudstone is hard and lens well weathered - the roots start to go across surface of harder material

SITE NAME	PROFILE NO.	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
East of Alvechurch	Pit 3 (ASP 23)		Grass	Av Rainfall: 752 mm ATO: 1361 day °C	
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY	FC Days: 181 Climatic Grade: 1 Exposure Grade: 1	PSD SAMPLES TAKEN
32/97	24/6/97		SH/SK		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	MCL	10YR42	2% HR (VIS)	CDFO *[1] 75YR46	None	-	-	-	-	MF	-	Sharp smooth
2	42	C	25Y51/61	4% HR (VIS)	MDFO 75YR46	Few	SCSAB	Firm	Moderate	Good	FF	-	Clear wavy
3	50	C	25Y51/61	0% (VIS)	MDFO 75YR46	None	Massive	Very Firm	Poor	Poor	FF	-	Gradual smooth
4	80+	C	05YR44 05GY61	0% (VIS)	MDFO 75YR46	None	Massive	Very Firm	Poor	Poor	FF	-	-

Profile Gleyed From: 30 cm

Depth to Slowly Permeable Horizon: 42 cm

Wetness Class: IV

Wetness Grade: 3b

Available Water Wheat: 131 mm

Potatoes: 108 mm

Moisture Deficit Wheat: 90 mm

Potatoes: 77 mm

Moisture Balance Wheat: 41 mm

Potatoes: 31 mm

Droughtiness Grade: 1 (Calculated to 120 cm)

Final ALC Grade: 3b

Main Limiting Factor(s): Wetness

Remarks: *[1] in pockets of 10YR52 HCL

SITE NAME	PROFILE NO.	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
East of Alvechurch	Pit 4 (ASP 78)		Cereal	Av Rainfall: 752 mm ATO: 1361 day °C	-
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY	FC Days: 181 Climatic Grade: 1 Exposure Grade: 1	PSD SAMPLES TAKEN
32/97		SP 0313 7272	SH/SK		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	MCL	10YR32	15% > 6cm 15% > 2cm 30% HR (S)	None	None	-	-	-	-	MF, VF	-	Smooth abrupt
2	100	C	05YR43 (75YR52)	15% HR (VIS) (to 45 cm)	MDFO + G 75YR56, 58 05Y51	None	Massive	Very Firm	Poor	Poor	-	-	-

Profile Gleyed From: 30 cm

Depth to Slowly Permeable Horizon: 30 cm

Wetness Class: IV

Wetness Grade: 3b

Available Water	Wheat:	107 mm
	Potatoes:	86 mm
Moisture Deficit	Wheat:	90 mm
	Potatoes:	77 mm
Moisture Balance	Wheat:	17 mm
	Potatoes:	9 mm

Droughtiness Grade: 2 (Calculated to 120 cm)

Final ALC Grade: 3b

Main Limiting Factor(s): Wetness

Remarks: Also topsoil stone limitation

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.