RPT006

078/98

East of Kidderminster

Agricultural Land Classification

November 1998

Resource Planning Team
FRCA Worcester
Western Region

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EAST OF KIDDERMINSTER

AGRICULTURAL LAND CLASSIFICATION SURVEY

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EAST OF KIDDERMINSTER

AGRICULTURAL LAND CLASSIFICATION SURVEY

INTRODUCTION

1 This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of 259 8 ha of land at East of Kidderminster Field survey was based on 241 auger borings and 12 soil profile pits and was completed in October 1998 During the survey 19 samples were 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 Worcestershire County 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 Grades 2 and 3 part of the site was previously surveyed prior to 1989 at a scale of 1 25000 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 under cereal permanent pasture potatoes sugar beet horticultural cropping and linseed Other land which was not surveyed included residential and agricultural buildings roads and tracks a nursery retirement home and woodland

SUMMARY

5 The distribution of ALC grades is shown on the accompanying 1 10000 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 East of Kidderminster

Grade	Area (259 8 ha)	% Surveyed Area (235 2 ha)
1	9 8	4 2
2	170 3	72 4
3a	42 0	17 9
3b	11 1	4 7
4	2 0	0 8
Other land	24 6	
Total site area	259 8	

6 Land of best and most versatile quality covers the majority of the site Small areas of Subgrade 3b and Grade 4 land are mapped in the north of the site and south of Hodge Hill Nurseries where gradient is the main limiting factor

7 Grade 1 quality land has been mapped in two isolated areas around Park Hall and South of Offend Farm the sandy soils are neither limited by soil droughtiness nor soil wetness

8 Grade 2 soils cover the majority of the site south of the A456 Birmingham Road These soils have loamy sand topsoils and are not limited by soil droughtiness but due to the topsoil texture must be restricted to Grade 2 Soils of Subgrade 3a quality are mapped north of the A456 road here the soils are variably stony and are limited in their use by soil droughtiness

CLIMATE

9 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

10 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

11 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 150 151 was found just south of Offmoor Farm

Table 2 Climatic Interpolations East of Kidderminster

Grid Reference		SO 854 760	SO 856 769
Altitude (m)		50	75
Accumulated Temperature (day C)		1441	1412
Average Annual Rainfall (mm)		661	683
Overall Climatic Grade		1	1
Field Capacity Days		149	154
Moisture deficit (mm)	Wheat	104	100
	Potatoes	95	90

RELIEF

10 Altitude ranges from 38 metres at Heathy Mill Farm to 80 metres at south of Hodgehill Nurseries The land is generally gently undulating but with some slopes over 7 occurring along the northern boundary of the site around Hurcott and around Park Hall a further area of steep slopes is mapped south of Hodge Hill Nurseries These areas are limited in their agricultural grade to Subgrade 3b

11 The sandy soils in the centre of the site on the steeper slopes east of Offmoor Farm may be at risk of water and wind erosion if left uncropped over winter

GEOLOGY AND SOILS

12 The underlying geology of the site is shown on the published geology map (BGS 1976) as largely Triassic Sandstone with drift deposits of Terrace Gravels north of the A456 and east of Heathy Mill Farm In the recent survey the soils were found to match the published geology

13 Soils were mapped by the Soil Survey of England and Wales at a reconnaissance scale of 1 250 000 (SSEW 1983) as the Blackwood Soil Association across the southern half of the site the Bridgenorth Soil Association in the north with an area of Newport 4 Soil Association north and south of A456 Birmingham Road

14 The Blackwood Soil Association is described as having deep permeable sandy and coarse loamy soils overlying glacial drift The Bridgenorth Soil Association has well drained sandy and coarse loamy soils over sandstone the soils will be occasionally deeper and there is a risk of water and wind erosion The soils of the Newport Association are deep well drained and sandy some may be very acidic with a bleached sub surface horizon again there may be the risk of wind erosion

15 In the recent ALC survey soils were found to compare favourably with the published distribution

AGRICULTURAL LAND CLASSIFICATION

16 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

Grade 1

17 Soils of excellent quality have been mapped in two isolated areas one south of Park Hall and the other south of Offmoor Farm South of Park Hall the soils were described as having fine sandy loam topsoil textures overlying slightly stony sandy loam subsoils to depth South of Offmoor Farm the soils were described as having peaty loam topsoil textures overlying sandyloam and loamy sand subsoils These soils have no restrictions to their agricultural use

Grade 2

18 The majority of the site is mapped as soils of very good quality These soils were described as having loamy fine sand topsoil textures overlying loamy fine sand upper subsoils and medium or fine sandy loam lower subsoils to depth The soils are generally stone free across the upper two thirds of the site and five soil profile pits confirmed that the soils are not limited by soil wetness nor soil droughtiness but the topsoil texture restricts the soils to Grade 2 Around Heathy Mill Farm and west of Hurcott Lane the soils have stony subsoil horizons and two soil profile pits confirmed these soils to be limited by soil droughtiness In the extreme south the soils have heavier topsoil and subsoil textures and a soil profile pit here confirmed that the soils have a minor wetness limitation placing them into Wetness Class II (see Appendix II) and Grade 2

Subgrade 3a

19 Soils of good agricultural quality have been mapped north of the A456 Birmingham Road these soils have been described as having medium sandy loam topsoil textures overlying loamy medium sand subsoils to depth the soils have variably stony subsoils and three soil profile pits confirmed the soils were moderately droughty

Subgrade 3b

20 Land mapped as Subgrade 3b moderate quality occurs across the north of the site south of Hodge Hill Nurseries and west of Glebe House This land has gradients in excess of 7 and as such cannot be graded higher than Subgrade 3b

Grade 4

21 Two small areas of Grade 4 land are mapped west of Hurcott Lane and east of Offmoor Farm in these areas slope gradients in excess of 11° restricts this land to no higher than Grade 4 in quality

Other Land

22 Other land includes residential and agricultural buildings roads and tracks a nursery retirement home and woodland

Suzanne Hunter
Resource Planning Team
FRCA Worcester
November 1998

REFERENCES

BRITISH GEOLOGICAL SURVEY/INSTITUTE OF GEOLOGICAL SCIENCES **(1976)** Sheet 182 Droitwich 1 50 000 series Solid and Drift edition BGS London

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

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

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

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

SOIL SURVEY OF ENGLAND AND WALES (1983) Sheet 3 Soils of Midland and Western England 1 250 000 scale SSEW Harpenden

SOIL SURVEY OF ENGLAND AND WALES (1984) Soils and Their Use in Midland and Western England Bulletin No 12 SSEW Harpenden

APPENDIX I

DESCRIPTION OF GRADES AND SUBGRADES

Grade 1 excellent quality agricultural land

Land with no or very minor limitations to agricultural use A very wide range of agricultural and horticultural crops can be grown and commonly include top fruit soft fruit salad crops and winter harvested vegetables Yields are high and less variable than on land of lower quality

Grade 2 very good quality agricultural land

Land with minor limitations which affect crop yield cultivations or harvesting A wide range of agricultural and horticultural crops can usually be grown but on some land in the grade there may be reduced flexibility due to difficulties with the production of the more demanding crops such as winter harvested vegetables and arable root crops The level of yield is generally high but may be lower or more variable than Grade 1

Grade 3 good to moderate quality agricultural land

Land with moderate limitations which affect the choice of crops timing and type of cultivation harvesting or the level of yield Where more demanding crops are grown yields are generally lower or more variable than on land in Grades 1 and 2

Subgrade 3a good quality agricultural land

Land capable of consistently producing moderate to high yields of a narrow range of arable crops especially cereals or moderate yields of a wide range of crops including cereals grass oilseed rape potatoes sugar beet and the less demanding horticultural crops

Subgrade 3b moderate quality agricultural land

Land capable of producing moderate yields of a narrow range of crops principally cereals and grass or lower yields of a wider range of crops or high yields of grass which can be grazed or harvested over most of the year

Grade 4 poor quality agricultural land

Land with severe limitations which significantly restrict the range of crops and/or level of yields It is mainly suited to grass with occasional arable crops (eg cereals and forage crops) the yields of which are variable In most climates yields of grass may be moderate to high but there may be difficulties in utilisation The grade also includes very droughty arable land

Grade 5 very poor quality agricultural land

Land with very severe limitations which restrict use to permanent pasture or rough grazing except for occasional pioneer forage crops

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

APPENDIX II

DEFINITION OF SOIL WETNESS CLASSES

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

Wetness Class I

The soil profile is not wet within 70 cm depth for more than 30 days in most years

Wetness Class II

The soil profile is wet within 70 cm depth for 31 90 days in most years or if there is no slowly permeable layer within 80 cm depth it is wet within 70 cm for more than 90 days but not wet within 40 cm depth for more than 30 days in most years

Wetness Class III

The soil profile is wet within 70 cm depth for 91 180 days in most years or if there is no slowly permeable layer within 80 cm depth it is wet within 70 cm for more than 180 days but only wet within 40 cm depth for between 31 and 90 days in most years

Wetness Class IV

The soil profile is wet within 70 cm depth for more than 180 days but not within 40 cm depth for more than 210 days in most years or if there is no slowly permeable layer within 80 cm depth it is wet within 40 cm depth for 91 210 days in most years

Wetness Class V

The soil profile is wet within 40 cm depth for 211 335 days in most years

Wetness Class VI

The soil profile is wet within 40 cm depth for more than 335 days in most years

Notes The number of days specified is not necessarily a continuous period

In most years is defined as more than 10 out of 20 years

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

APPENDIX III

ABBREVIATIONS AND TERMS USED IN SURVEY DATA

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

1 Terms used on computer database in order of occurrence

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

LAND USE At the time of survey

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

GRDNT Gradient as estimated or measured by hand held optical clinometer

GLEY SPL Depth in centimetres to gleying or slowly permeable layer

AP (WHEAT/POTS) Crop adjusted available water capacity

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

DRT Best grade according to soil droughtiness

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

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

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

OC	Overall Climate	**AE**	Aspect	**EX**	Exposure
FR	Frost Risk	**GR**	Gradient	**MR**	Microrelief
FL	Flood Risk	**TX**	Topsoil Texture	**DP**	Soil Depth

CH	Chemical	**WE**	Wetness	**WK**	Workability
DR	Drought	**ER**	Erosion Risk	**WD**	Soil Wetness/Droughtiness
ST	Topsoil Stoniness				

TEXTURE Soil texture classes are denoted by the following abbreviations

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

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

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

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

MOTTLE COL Mottle colour using Munsell notation

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

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

MOTTLE CONT Mottle contrast

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

PED COL Ped face colour using Munsell notation

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

STONE LITH Stone Lithology One of the following is used

HR	All hard rocks and stones	**SLST**	Soft oolitic or dolimitic limestone
CH	Chalk	**FSST**	Soft fine grained sandstone
ZR	Soft argillaceous or silty rocks	**GH**	Gravel with non porous (hard) stones
MSST	Soft medium grained sandstone	**GS**	Gravel with porous (soft) stones

SI Soft weathered igneous or metamorphic rock

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

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

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

CONSIST Soil consistence is described using the following notation

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

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

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

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

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

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

2 Additional terms and abbreviations used mainly in soil pit descriptions

STONE ASSESSMENT

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

MOTTLE SIZE

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

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

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

MANGANESE CONCRETIONS Assessed by volume

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

POROSITY

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

ROOT ABUNDANCE

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

ROOT SIZE

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

HORIZON BOUNDARY DISTINCTNESS

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

HORIZON BOUNDARY FORM Smooth wavy irregular or broken *

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

SITE NAME	PROFILE NO	SLOPE AND ASPECT	LAND USE			PARENT MATERIAL
East of Kidderminster	PIT1 (ASP 75 88)	5 NE	PGR	Av Rainfall ATO	682 mm 1412 day C	Upper Mottled Sandstone
JOB NO	DATE	GRID REFERENCE	DESCRIBED BY	FC Days Climatic Grade Exposure Grade	153 1	PSD SAMPLES TAKEN
78/98	24/8/98	SO 8539 7767	SK/KM			Topsoil 0 25cm LMS s 81% z 11% C 8%

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	1	L(M)S	75YR3/2	<1% HR(std)	none	none					MF+VF		
2	34	L(M)S	75YR3/3	<1% HR	none	none	WKCSAB	FR	Good	Good	CF+VF		
3	120	MS	25YR3/4	<1% HR	none	none	WKCSAB	FR	Good	Good	FF+VF		

Profile Gleyed From	not gleyed	Available Water	Wheat	80mm	Final ALC Grade 3a
Slowly Permeable Horizon From	no SPL		Potatoes	64mm	Main Limiting Factor(s) DR
Wetness Class	I	Moisture Deficit	Wheat	99mm	Remarks *Close to 3a/3b boundary*
			Potatoes	89mm	
Wetness Grade	1	Moisture Balance	Wheat	19mm	
			Potatoes	25mm	
		Droughtiness Grade	3a	(Calculated to 120 cm)	

SITE NAME	PROFILE NO	SLOPE AND ASPECT	LAND USE			PARENT MATERIAL
Kidderminster East	PIT 2(ASP 34 52)	Level	PGR	Av Rainfall ATO FC Days Climatic Grade Exposure Grade	674 mm 1440 day C 153 1	Terrace deposits
JOB NO	DATE	GRID REFERENCE	DESCRIBED BY			PSD SAMPLES TAKEN
78198	27/8/98	SO 8539 7767	GMS/KAM			Topsoil 0 25cm MSL s 75% z 16% c 9%

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	MSL te d g t w rd g	75YR3/2	Var abl 3% > 6 m 5% >2 m 21%< 2mm 29% HR(S&D)	none	none					MF+VF		clear smooth
2	80	MSL	75YR4/3	7%>6 m 12%>2 m 24%<2mm) 43%HR (S&D)	none	none	WKMSAB	friable	good	good	MF+VF		gradual wavy
3	120	MLS	25YR4/4	12% 6 m 17% 2cm 19%>2 m 48%HR(S&D St l s	none	none	WKMAB	very friable	good	good	FVF		clear irregular
	95 120	MSL	25YR4/4		none	none	MDVCAB	friable	moderate	low			

Profile Gleyed From	not gleyed	Available Water	Wheat	96mm	Final ALC Grade 3a
Slowly Permeable Horizon From	no SPL		Potatoes	78mm	Main Limiting Factor(s) DR
Wetness Class	1	Moisture Deficit	Wheat Potatoes	103mm 93mm	Remarks H3 p t hy m re to l d Oth rs ry t y
Wetness Grade	1	Moisture Balance	Wheat Potatoes	7mm 15mm	
		Droughtiness Grade	3a	(Calculated to 120 cm)	

SITE NAME	PROFILE NO	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
East of Kidderminster	PIT 3 (ASP 70)	1 W	PGR	Av Rainfall 680mm ATO 1423day C FC Days 155 Climatic Grade 1 Exposure Grade	Upper Mottled Sandstone
JOB NO	DATE	GRID REFERENCE	DESCRIBED BY		PSD SAMPLES TAKEN
78/98	27/8/98	SO 8580 7750	SH/GN		Topsoil 0 25cm LFS s 79% z 14% c 7%

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	34	lfs	5YR3/1	2%HR	none	none				good	MF+VF		gradual smooth
2	50	lfs	5YR3/1	2% HR	none	none	MDCAB	FR	good	good	MF+VF		gradual smooth
3	75	lfs	75YR3/3	A th t y l ye o c rs t t p f H3 3%HR	none	none	MD CPL breaking to WDCAB4	FR	good	good	CF+VF		abrupt smooth
4	95	fsl	25Y5/4	1%HR	none	none	MDCPL	VF	moderate	good	CF+VF		clear smooth
5	120	fsl	5Y5/3 with 25Y5/4	1% HR	none	none	MDCPL breaking to MD CSAB	FR	moderate	good	FF+VF		

Profile Gleyed From	not gleyed	Available Water	Wheat	188mm
Slowly Permeable Horizon From	no SPL		Potatoes	131mm
Wetness Class	1	Mo sture Deficit	Whe t	101mm
			Potatoes	91mm
Wetness Grade	1	Moisture Balance	Wheat	87mm
			Potatoes	44mm
		Droughtiness Grade	1	(Calculated to 120cm)

Final ALC Grade 2

Main Limiting Factor(s) TOPSOIL TEXTURE

Remarks

Deep bleached Ea Padzolic soil

SITE NAME	PROFILE NO	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
East of Kiddrminster	PIT 4 (near ASP143)	0	Harvested peas	Av Rainfall 669mm ATO 1435day C	Upper Mottled Sandstone
JOB NO	DATE	GRID REFERENCE	DESCRIBED BY	FC Days 152 Climatic Grade 1 Exposure Grade	PSD SAMPLES TAKEN Topsoil 0 25cm LFS s 82% z 11% c 7% Lower subsoil 80 100cm FSL s 77% z 9% c 14%
78/98	3/9/98	SO 8600 7680	SH/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	35	lfs	7 5YR42	1% HR(S)	none	none					CF+VF		smooth abru
2	65 (57 79)	lfs	7 5 YR54	2%HR(s)	none	none	MDCPty breaking to MDCAB	VF	good	low	FVF	1	Irregular clear
2a	56 79	lfs	05YR54		none	none							
3	95	fsl	2 5YR46		none	few	WKCSAB	FR	good	low	FVF seen to 94cm		smooth clear
4	120	fsl	2 5YR36		none	few	MDCpty	Fr	moderate	low	none		

Profile Gleyed From	not gleyed	Available Water	Wheat 175mm
Slowly Permeable Horizon From	no SPL		Potatoes 124mm
Wetness Class	I	Moisture Deficit	Wheat 103mm
			Potatoes 94mm
Wetness Grade	1	Moisture Balance	Wheat 79mm
			Potatoes 20mm
		Droughtiness Grade	1 (Calculated to 120 cm)

Final ALC Grade 2

Main Limiting Factor(s)TOPSOIL TEXTURE

Remarks

Negligible stone <2cm
H2a is a pocket of material on one fact of pit
H3 below 103cm bands of clayer material

SITE NAME	PROFILE NO	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
East of Kidderminster	PIT5 (ASP211)	1 S	CER	Av Rainfall 663mm ATO 1441 day C	Upper mottled sandstone
JOB NO	DATE	GRID REFERENCE	DESCRIBED BY	FC Days 150 Climatic Grade 1 Exposure Grade	PSD SAMPLES TAKEN
78/98	8/9/98	SO 85507590	SH/GMS		Topsoil 0 25cm LFS s 80% z 12% c 8%

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	35	lfs	5YR42	1% HR (ed)	none	none					CVF+F		smooth sharp
2	67	lfs	5YR44	8%HR(s e ed)	FFFO 5YR56	Few	WKCSAB	VF	moderate	low	FVF		smooth clear
3	84	lfs	5YR56	gl g bl	FFFO 75YR56	none	WKCAB	VF	moderate	low	FVF		smooth clear
4	120	MSL	25YR46										

Profile Gleyed From	not gleyed	
Slowly Permeable Horizon From	no SPL	
Wetness Class	I	
Wetness Grade	1	

Available Water	Wheat	181mm
	Potatoes	132mm
Moisture Deficit	Wheat	104mm
	Potatoes	95mm
Moisture Balance	Wheat	77mm
	Potatoes	37mm
Droughtness Grade	1	(Calculated to 120cm)

Final ALC Grade 2

Main Limiting Factor(s) ~~NONE~~ TOPSOIL TEXTURE

Remarks
No small stones all pebble size hence no small s e ing

SITE NAME	PROFILE NO	SLOPE AND ASPECT	LAND USE			PARENT MATERIAL
East of Kidderminster	PIT 6 (ASP 71 63)	5 W	PGR	Av Rainfall ATO	682mm 1412day C	Upper mottled sandstone
JOB NO	DATE	GRID REFERENCE	DESCRIBED BY	FC Days Climatic Grade Exposure Grade	153 1	PSD SAMPLES TAKEN
78/98	9/9/98	SO 8490 7744	SYH/GMS			Topsoil 0 25cm FS/LFS s 88% z 9% c 3%

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	34	lfs	10YR3/1	3 5%HR(std)	none	none					MF+VF		smooth gradual
2	55	lfs	75YR3/2	8% 2 m 4% < 2 m 12% HR (td)	none	none	WKCSAB	VF	Good	Low	CF+VK		smooth clear
3	72	lfs	25YR4/3	20% > 2 m 8% 2 m 28% HR (td)	none	none	MDCAB	FR	good	low	CF+VF		smooth clear
4	120	fsl	25YR4/6	o e	none	none	MDCPL	FR	mod	low	FVF across platy surfaces		

Profile Gleyed From	not gleyed	
Slowly Permeable Horizon From	no SPL	
Wetness Class	I	
Wetness Grade	1	
Available Water	Wheat	154mm
	Potatoes	107mm
Moisture Deficit	Wheat	99mm
	Potatoes	89mm
Moisture Balance	Wheat	+55mm
	Potatoes	+18mm
Droughtiness Grade	1	(Calculated to 120 cm)

Final ALC Grade 2

Main Limiting Factor(s) TOPSOIL TEXTURE

Remarks

H3 stone content is variable

SITE NAME	PROFILE NO	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
East of Kidderminster	Pit 7 (ASP 40)	2 N	CER	Av Rainfall 687 mm ATO 1438 day C FC Days 158 Climatic Grade 1 Exposure Grade	Terrace deposits
JOB NO	DATE	GRID REFERENCE	DESCRIBED BY		PSD SAMPLES TAKEN
78/98	9/9/98	SO 8600 7770	SH/GS		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	32	MSL	75YR3/2	39 HR (s + d)	None	None					MF + VF		smooth abrupt
2	60	LMS	5YR3/4	35% 2 m 25% < 2 m 60% HR ( )	None	None	WK M AB	VF	mod	Good	MF + VK		smooth gradual
3	80	LMS	5YR4/4	40% > 2 cm 36% < 2 m 76% HR (– d)	None	None	WK M SAB	VF	mod	mod	FVF		smooth gradual
4	90	LMS	5YR4/4	40% > 2 cm 13% < 2 cm 53% HR (s + d)	None	None	Weakly de eloped but to es mak t d ff lt t se cc rately	VF	mod	mod	none seen		smooth abrupt
5	120	FSZL	25YR4/6 25YR5/6 pl ty s rf	No e	None	on surf of horizon	MD C PL	FR	mod	poor	none		

Profile Gleyed From	not gleyed
Slowly Permeable Horizon From	no SPL
Wetness Class	I
Wetness Grade	1

Available Water	Wheat	109 mm
	Potatoes	63 mm
Moisture Deficit	Wheat	103 mm
	Potatoes	94 mm
Moisture Balance	Wheat	+6 mm
	Potatoes	31 mm
Droughtiness Grade	3b	(Calculated to 120 cm)

Final ALC Grade	3b
Main Limiting Factor(s)	DR

Remarks Nearly 3a likely to be worst case in area

SITE NAME	PROFILE NO	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
East of Kidderminster	Pit 8 (ASP 234)		CER	Av Rainfall 656 mm ATO 1447 day C	Terrace deposits
JOB NO	DATE	GRID REFERENCE	DESCRIBED BY	FC Days 148 Climatic Grade 1 Exposure Grade	PSD SAMPLES TAKEN
78/98	15/9/98	SO 8500 7500	SH/GN		Topsoil 0 25cm MSL/LMS s 76% z 16% c 8%

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	MSL	75YR32	3% > 2 3% < 2 6% HR (+ d)	None	None					MFVF	None	Smooth Clear
2	45	MSL	75YR63	S m top 1	C FeMot	None	MD CAB (slightly platy)	Friable	Moderate		MFVF	None	Wavy Clear
3	55	MSL	05YR46	20% > 2 (+ d)	None	None	MD CAB	V Friable	Moderate	Good	MFVF	None	Smooth Gradual
4	70	MSL	25YR46	50% > 2 (s + d)	None	None	WD CSAB	V Friable	Good	Good	CFVF	None	Gradual Wavy
5	95	LMS	25YR46	35% 2 (+ d)	None	None	WD CSAB	V Friable	Moderate	Good	FVF	None	
6	120	FSL	25YR48 (75YR73)	0%			MD C Platy	V Friable	Moderate	Low	None seen	None	

Profile Gleyed From None

Slowly Permeable Horizon From None

Wetness Class I

Wetness Grade 1

Available Water	Wheat	131 mm
	Potatoes	91 mm
Moisture Deficit	Wheat	105 mm
	Potatoes	97 mm
Moisture Balance	Wheat	+26 mm
	Potatoes	6 mm
Droughtiness Grade	2	(Calculated to 120 cm)

Final ALC Grade 2

Main Limiting Factor(s) DR

Remarks

SITE NAME	PROFILE NO	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
East of Kidderminster	PIT 9 (ASP 252)	0	Cereal stubble	Av Rainfall 659mm ATO 1441 day C FC Days 148 Climatic Grade 1 Exposure Grade	Alluvium
JOB NO	DATE	GRID REFERENCE	DESCRIBED BY		PSD SAMPLES TAKEN
78/98	15/9/98	SO 8530 7530	GMS		Topsoil 0 25cm FSL close to SCL s 66% z 18% c 16%

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	SCL	5YR41	2%HR( )	none	none					MVF		Clear smooth
2	38	SCL	7 5YR41	2%HR(s)	CDFO 7 5YR56	none	MDCAB	friable	M	low	CVF		Abrupt smooth
3	55	HCL	10YR41		CDFO 7 5YR56	none	MDCAB	friable	M	low	FVF		Abrupt smooth
4	60	C	10YR61	e	CDFO 7 5YR56	none	weak	friable		good	MF+M		Abrupt smooth
5	75	MZCL	7 5YR52	no e	none	none	MDCAB	friable	M	good	VM F+M		Clear smooth
6	110+	MSL	10YR62		none	none	MDCAB	friable	M	good	VMF+M		

Profile Gleyed From	25cm	Available Water	Wheat	143mm
			Potatoes	113mm
Slowly Permeable Horizon From	no SPL			
Wetn ss Cl ss	II	Mo sture Def c t	Wheat	104mm
			Potatoes	96mm
Wetness Grade	2	Moisture Balance	Wheat	39mm
			Potatoes	17mm
		Droughtiness Grade	1	(Calculated to 110cm)

Final ALC Grade 2

Main Limiting Factor(s) WETNESS

Rema ks

SITE NAME	PROFILE NO	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
East of Kidderminster	Pit 10 (ASP 202)	1 NE	PLO	Av Rainfall 661 mm ATO 1441 day C FC Days 149 Climatic Grade 1 Exposure Grade	Upper Mottled Sandstone
JOB NO	DATE	GRID REFERENCE	DESCRIBED BY		PSD SAMPLES TAKEN
78/98	16/09/98	SO 8530 7600	SYH/GN		Topsoil 0 25cm FSL s 77% z 12% c 11%

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	FSL	5YR3/3	1% HR>2 m	None	None					CF + VF		smooth abrupt
2	50 cm (50 60 in one area on face of pit	FSL	5YR4/4	1% HR	few 5YR4/6 concentrated around mn mottles	common in 5 cm band at top of H2	WK C AB	VF	Good	Low	CF + VK		wavy clear
3	80	FSL	25YR4/6	N	none	common esp on ped surfs	MD C AB	FR	Mod	Low	FVF		smooth clear
4	120	FSL	25YR4/6 with banding of 75YR5/6	N	none	few small on platy surfs	MD CPL	FR but more cementation in than above	Mod	Low	None seen		

Profile Gleyed From	Not gleyed
Slowly Permeable Horizon From	No SPL
Wetness Class	1
Wetness Grade	1

Available Water	Wheat	+ 188 mm
	Potatoes	+ 133 mm
Moisture Deficit	Wheat	104 mm
	Potatoes	95 mm
Moisture Balance	Wheat	+ 84 mm
	Potatoes	+38 mm
Droughtiness Grade	1	(Calculated to 120 cm)

Final ALC Grade	1
Main Limiting Factor(s)	NONE

Remarks: Whether the textures are fine or medium sandy loam Grade is still 1

SITE NAME	PROFILE NO	SLOPE AND ASPECT	LAND USE			PARENT MATERIAL
East of Kidderminster	PIT11 (ASP44 27)	level	PGR	Av Rainfall ATO	677mm 1434day C	Terrace Deposits
JOB NO	DATE	GRID REFERENCE	DESCRIBED BY	FC Days Climatic Grade Exposure Grade	155 1	PSD SAMPLES TAKEN
78/98	16/9/98	SO 8638 7769	SYH/GN			Topsoil 0 25cm FSL s 75% z 16% c 9%

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 (30 40)	fsl	75YR3/2	1% HR	none	none					MF+VF		wavy clear
2	50	fsl	75YR44/46	20% > 2cm 8% < 2cm 28% HR (s+d)	none	none	MDCSAB	FR	mod	good	MF+VF		wavy clear
3	75	MSL	5YR4/6	15% 2 m 23% < 2cm 38% HR (+d)	none	none	MDCAB	VF	mod	good	MF+VF		smooth clear
4	120	CSL	25YR4/6	20% > 2 m 36% < 2 cm 56% HR (+d)	none	none	Too stony to assess accurately		mod	good	CVF		

Profile Gleyed From	not gleyed	Available Water	Wheat	140mm	Final ALC Grade 1
Slowly Permeable Horizon From	no SPL		Potatoes	119mm	Main Limiting Factor(s) NONE
Wetness Class	I	Moisture Deficit	Wheat	102mm	Remarks
			Potatoes	93mm	
Wetness Grade	1	Moisture Balance	Wheat	+38mm	
		Droughtiness Grade 1	Potatoes	+26mm (Calculated to 120 cm)	

SITE NAME	PROFILE NO	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
East of Kidderminster	PIT 12 (ASP138)	4 W	CER	Av Rainfall 683mm ATO 1412day C FC Days 154 Climatic Grade 1 Exposure Grade	Upper Mottled Sandstone
JOB NO	DATE	GRID REFERENCE	DESCRIBED BY		PSD SAMPLES TAKEN
78/98	16/9/98	SO 8550 7680	SYH/GN		Topsoil 0 25cm LFS s 85% z 9% c 6%

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	lfs	5YR33/32	1%HR	none	none					MR+VF		smooth abrupt
2	65 (60 70)	lfs	5YR4/6		none	none	MDCAB	FR	good	good	FVF		wavy clear
3	92 (90 95)	lfs	25YR3/6	none	none	none	STCPL	FM	moderate	low	FVF		wavy clear
4	120	lfs	25YR4/8		none	none	STCPL	FM	moderate	low	FVF roots only seen running horizontally across top of H4		

Profile Gleyed From	not gleyed	Available Water	Wheat	169mm	Final ALC Grade 2
Slowly Permeable Horizon From	no SPL		Potatoes	125mm	Main Limiting Factor(s) TOPSOIL TEXTURE
Wetness Class	I	Moisture Deficit	Wheat	100mm	Remarks
			Potatoes	95mm	
Wetness Grade	1	Moisture Balance	Wheat	+69mm	
			Potatoes	+35mm	
		Droughtiness Grade	1	(Calculated to 120 cm)	