

**Kinton Road, Southam**  
**Agricultural Land Classification**  
**March 1998**

Resource Planning Team  
Worcester  
FRCA Western Region

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**KINETON ROAD, SOUTHAM**  
**AGRICULTURAL LAND CLASSIFICATION SURVEY**

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## KINETON ROAD, SOUTHAM

### AGRICULTURAL LAND CLASSIFICATION SURVEY

#### INTRODUCTION

1. This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of 5.8ha of land at Kineton Road, Southam. Field survey was based on 4 auger borings and 1 soil profile pit, and was completed in March 1998. During the survey 1 sample was analysed for particle size distribution.
2. The survey was conducted by the Resource Planning Team of FRCA Western Region on behalf of MAFF in its statutory role in the Stratford upon Avon 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 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. At the time of survey land cover was cereals.

#### 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: Kineton Road, Southam**

<b>Grade</b>	<b>Area (ha)</b>	<b>% Surveyed Area (5.8 ha)</b>
3a	5.8	100.0
Total site area	5.8	100.0



## **RELIEF**

10. Altitude ranges from 93 metres along the western edge of the site, to 96 metres in the north eastern corner of the site, with no limitations due to slope gradient.

## **GEOLOGY AND SOILS**

11. The underlying geology of the site is shown on the published geology map (BGS 1984) as wholly Jurassic Lower Lias clays. In the recent ALC survey parent materials were found to be clay over brashy and fragmented limestone.
12. Soils were mapped by the Soil Survey of England and Wales at a reconnaissance scale of 1:250 000 (SSEW, 1983) as wholly the Evesham 1 Soil Association.
13. The soils of the Evesham 1 Soil Association are described as slowly permeable calcareous clayey soils associated with shallow well drained brashy calcareous soils over limestone.
14. In the recent ALC survey the soils were all found to be clayey but relatively shallow and brashy passing onto limestone.

## **AGRICULTURAL LAND CLASSIFICATION**

15. The distribution of ALC grades found by the current survey is shown on the accompanying 1:10000 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.
16. Subgrade 3a

Land of moderate quality occurs across the whole site. The soils were described as having a calcareous clay topsoil overlying a brashy calcareous clay subsoil which was occasionally found to be gleyed, over fractured limestone. A profile pit confirmed that the clay was well structured and not slowly permeable, placing the soils into Wetness Class I, (see Appendix II). The heavy nature of the topsoil imposes a minor workability limitation upon the soil, however the high stone content of the subsoil and the restricted rooting depth into the fractured limestone limits the water holding capacity of the soil and the soils are limited by soil droughtiness.

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March 1998

## **REFERENCES**

**BRITISH GEOLOGICAL SURVEY/INSTITUTE OF GEOLOGICAL SCIENCES (1984.)** Sheet 184 Warwick 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

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

<b>MREL:</b>	Microrelief limitation	<b>FLOOD:</b>	Flood risk	<b>EROSN:</b>	Soil erosion risk
<b>EXP:</b>	Exposure limitation	<b>FROST:</b>	Frost prone	<b>DIST:</b>	Disturbed land
<b>CHEM:</b>	Chemical limitation				

**LIMIT:** The main limitation to land quality: The following abbreviations are used.

<b>OC:</b>	Overall Climate	<b>AE:</b>	Aspect	<b>EX:</b>	Exposure
<b>FR:</b>	Frost Risk	<b>GR:</b>	Gradient	<b>MR:</b>	Microrelief
<b>FL:</b>	Flood Risk	<b>TX:</b>	Topsoil Texture	<b>DP:</b>	Soil Depth

<b>CH:</b> Chemical	<b>WE:</b> Wetness	<b>WK:</b> Workability
<b>DR:</b> Drought	<b>ER:</b> Erosion Risk	<b>WD:</b> Soil Wetness/Droughtiness
<b>ST:</b> Topsoil Stoniness		

**TEXTURE:** Soil texture classes are denoted by the following abbreviations:-

<b>S:</b> Sand	<b>LS:</b> Loamy Sand	<b>SL:</b> Sandy Loam
<b>SZL:</b> Sandy Silt Loam	<b>CL:</b> Clay Loam	<b>ZCL:</b> Silty Clay Loam
<b>ZL:</b> Silt Loam	<b>SCL:</b> Sandy Clay Loam	<b>C:</b> Clay
<b>SC:</b> Sandy clay	<b>ZC:</b> Silty clay	<b>OL:</b> Organic Loam
<b>P:</b> Peat	<b>SP:</b> Sandy Peat	<b>LP:</b> Loamy Peat
<b>PL:</b> Peaty Loam	<b>PS:</b> Peaty Sand	<b>MZ:</b> 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.

**GLEYS:** 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.

<b>HR:</b> All hard rocks and stones	<b>SLST:</b> Soft oolitic or dolimitic limestone
<b>CH:</b> Chalk	<b>FSST:</b> Soft, fine grained sandstone
<b>ZR:</b> Soft, argillaceous, or silty rocks	<b>GH:</b> Gravel with non-porous (hard) stones
<b>MSST:</b> Soft, medium grained sandstone	<b>GS:</b> 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

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

**CONSIST:** Soil consistence is described using the following notation:

<b>L:</b> Loose	<b>VF:</b> Very Friable	<b>FR:</b> Friable	<b>FM:</b> Firm
<b>VM:</b> Very firm	<b>EM:</b> Extremely firm	<b>EH:</b> 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:

<b>VIS:</b> Visual	<b>S:</b> Sieve	<b>D:</b> Displacement
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**MOTTLE SIZE:**

<b>EF:</b> Extremely fine <1mm	<b>M:</b> Medium 5-15mm
<b>VF:</b> Very fine 1-2mm>	<b>C:</b> Coarse >15mm
<b>F:</b> 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

<b>N:</b> None	<b>M:</b> Many	20-40%
<b>F:</b> Few <2%	<b>VM:</b> Very Many	>40%
<b>C:</b> 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 <sup>2</sup> :		Very Fine and Fine	Medium and Coarse
<b>F:</b>	Few	1-10	1 or 2
<b>C:</b>	Common	10.25	2 - 5
<b>M:</b>	Many	25-200	>5
<b>A:</b>	Abundant	>200	

**ROOT SIZE**

<b>VF:</b> Very fine <1mm	<b>M:</b> Medium 2 - 5mm
<b>F:</b> Fine 1-2mm	<b>C:</b> Coarse >5mm

**HORIZON BOUNDARY DISTINCTNESS:**

<b>Sharp:</b> <0.5cm	<b>Gradual:</b> 6 - 13cm
<b>Abrupt:</b> 0.5 - 2.5cm	<b>Diffuse:</b> >13cm
<b>Clear:</b> 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	Av Rainfall: 659 mm	PARENT MATERIAL
Kineton Road		Pit1(Asp2-3)	1°E	Cer	ATO: 1384 day °C	Jurassic Lower Lias Clays
JOB NO.		DATE	GRID REFERENCE	DESCRIBED BY	FC Days: 142	PSD SAMPLES TAKEN
08/98		18-3-98	SP 4095 6121	SH/SR	Climatic Grade: 1	T.S. 0-25CM clay s:10%,z:34%,c:56%
					Exposure Grade: -	

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	25YR4/2	1%>2cm 3%HR (S+D)	None	None	-	-	-	-	MF+VF	5-10%	Smooth gradual
2	30-34	C	25Y4/2	2%HR (S+D)	None	None	-	-	-	-	MR + VF	5-10%	Wavy abrupt
3	47	C	25YR5/3 (25Y5/2)	8%HR (S+D)	None	None	MDCSAB breaking to MSAB	FM	MOD	G	CF+VF	5-10%	Smooth clear
4	54	C	25Y5/3- 6/3 (25Y6/3) patches	44%HR(S+D)	c,f,d, 25Y5/6	None	MDCSAB breaking to MSAB	FM	MOD	G	CF+VF	5-10%	Wavy gradual
5	67	C	25Y5/3- 6/3 25Y6/2- 6/3	50%HR(vis)	c,f,d 10YR5/6+ 25Y5/6	None	-	-	-	G	FF+VF		
6	100	C	25Y5/3- 6/3	70%HR(vis)	-	-	Too stony to assess	-	-	-		5-10%	

Profile Gleyed From:	47cm	Available Water	Wheat: 101mm	Final ALC Grade:3a
Slowly Permeable Horizon From:	-		Potatoes 95mm	Main Limiting Factor(s) DR
Wetness Class:	1	Moisture Deficit	Wheat 102mm	Remarks: All horizons very effervescent (CaCO <sub>3</sub> 5-10%) Clay is very well structured and porous. Roots pass into each horizon but do run horizontally across the large rocks in H5+6.
			Potatoes 93mm	
Wetness Grade:	2	Moisture Balance	Wheat: -1mm	
		Droughtiness Grade: 3a	Potatoes 2mm : (Calculated to 120 cm)	