MAFF Ministry of Agriculture Fisheries and Food

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Runfold Sandpit
Surrey
Agricultural Land Classification
ALC Map & Report
April 1993

RUNFOLD SANDPIT, SURREY

AGRICULTURAL LAND CLASSIFICATION

1.0 Introduction

1.1 In April 1993, an Agricultural Land Classification (ALC), survey was carried out on 3.2 ha of land west of Runfold in Surrey. The site is located immediately south of the A31 Farnham to Guildford road. ADAS was commissioned by MAFF's Land Use Planning Unit to determine the quality of land affected by proposed working for sand.

1.2 The survey was carried out by members of the Resource Planning Team of the Guildford Statutory Group at a detailed level of approximately one boring per hectare. A total of 3 borings and one soil inspection pit were described in accordance with MAFF's revised guidelines and criteria for grading the quality of agricultural land, (MAFF, 1988). These guidelines provide a framework for classifying land according to the extent to which its physical or chemical characteristics impose long term limitations on its agricultural use.

At the time of survey, the land was in permanent pasture being grazed by sheep.

1.3 The distribution of grades and sub-grades is shown on the attached ALC map and the areas and extent are given in the table below. The map has been drawn at a scale of 1:5,000. It is accurate at this scale, but any enlargement may be misleading.

Distribution of Grades and Subgrades

Grade	Area (ha)	% total agricultural land
3b	2.7	100
Total agricultural area	2.7	100
Non-agricultural	0.5	
Total area of site	3.2 ha	

1.4 A general description of the grades, sub-grades and land-use categories identified in this survey is provided in Appendix 1. The main classes are described in terms of the type of limitation that can occur, the typical cropping range and the expected level and consistency of yield.

1.5 The agricultural land surveyed has been assigned to Sub-grade 3b, moderate quality. Deep, well drained sandy soils are limited in their agricultural use by significant soil droughtiness. Sandy soils have relatively low reserves of profile available water and crops may suffer serious drought stress as a result.

2.0 Climate

2.1 Estimates of climatic variables relevant to the assessment of agricultural land quality were obtained by interpolation from a 5 km grid point dataset, (Met. Office, 1989) for a representative location in the survey area.

Climatic Interpolation

Grid Reference	SU865474
Altitude (m AOD)	80
Accumulated Temperature (° days, Jan - June)	1440
Average Annual Rainfall (mm)	728
Field Capacity Days	155
Moisture Deficit, Wheat (mm)	106
Moisture Deficit, Potatoes (mm)	98

2.2 The important parameters in assessing an overall climatic limitation are, accumulated temperature, as measure of the relative warmth of a locality, and average annual rainfall, as a measure of overall wetness. This site is not affected by an overall climatic limitation, nor are any local climatic factors, such as exposure or frost risk, significant.

2.3 However, climatic factors do combine with soil factors to influence the interactive limitations of soil wetness and droughtiness.

3.0 Relief

3.1 The site lies at an altitude of 80-85 m AOD and land slopes very gently towards the north and west. Nowhere on the site does gradient or microtopography represent a limitation to agricultural land quality.

4.0 Geology and Soil

4.1 British Geological Survey (1976) Sheet 285, Aldershot shows the entire site to be underlain by Folkestone Beds which largely comprise sand deposits.

4.2 Soil Survey of England and Wales, (1983) Sheet 6, Soils of South-East England shows the site to comprise soils of the Frilford association, these being described as 'permeable well drained, argillic brown sands', (SSEW, 1984).

4.3 Detailed field examination of the soils on the site confirms the presence of freely draining sandy soils consistent with these described by the Soil Survey.

5.0 Agricultural Land Classification

5.1 The ALC grading of the survey area is primarily determined by the interaction of soil and climatic factors to give rise to a soil droughtiness limitation. The resulting restriction on the use of the land for agriculture is such that Sub-grade 3b is appropriate.

Subgrade 3b

5.2 The entire agricultural area surveyed has been mapped as Sub-grade 3b, moderate quality agricultural land. Profiles typically comprise non-calcareous medium sandy loam or loamy medium sand topsoils which may contain 5% by volume total hard sandstone fragments. These overlie loamy medium sand or medium sand subsoils which may contain up to 15% total stone by volume. Soils are well drained, (Wetness Class I) and are generally deep and moderately well structured. However, these freely draining sandy soils have only moderate reserves of available water which may be exploited by crops and the land is thereby limited by significant soil droughtiness.
Land mapped as Sub-grade 3b is capable of producing moderate yields of a narrow range of crops, principally cereals and grass.

April 1993
ADAS Reference: 4010/57/93
MAFF Reference: EL 40/0227 J451

Resource Planning Team
Guildford Statutory Centre
ADAS Reading

SOURCES OF REFERENCE

* British Geological Survey (1976), Sheet No 285, Aldershot, 1:50,000.

* MAFF (1988), Agricultural Land Classification of England and Wales : Revised guidelines and criteria for grading the quality of agricultural land.

* Meteorological Office (1989), Climatic datasets for Agricultural Land Classification.

* Soil Survey of England and Wales (1983), Sheet 6, Soils of South-East England, 1:250,000.

* Soil Survey of England and Wales (1984) Bulletin 15, Soils and their use in South-East England.

DESCRIPTION OF THE GRADES AND SUB-GRADES

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 includes 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 or horticultural crops can usually be grown but on some land on 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. When more demanding crops are grown yields are generally lower or more variable than on land in grades 1 and 2.

Sub-grade 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.

Sub-grade 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 the 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 moist 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.

Urban

Built-up or 'hard' uses with relatively little potential for a return to agriculture : housing, industry, commerce, education, transport, religious buildings, cemeteries. Also, hard-surfaced sports facilities, permanent caravan sites and vacant land; all types of derelict land, including mineral workings which are only likely to be reclaimed using derelict land grants.

Non-agricultural

'Soft' uses where most of the land could be returned relatively easily to agriculture, including : private parkland, public open spaces, sports fields, allotments and soft-surfaced areas on airports/airfields. Also active mineral workings and refuse tips where restoration conditions to 'soft' after-uses may apply.

Woodland

Includes commercial and non-commercial woodland.

Agricultural Buildings

Includes the normal range of agricultural buildings as well as other relatively permanent structures such as glasshouses. Temporary structures (eg. polythene tunnels erected for lambing) may be ignored.

Open Water

Includes lakes, ponds and rivers as map scale permits.

Land Not Surveyed

Agricultural land which has not been surveyed.

Where the land use includes more than one of the above, eg. buildings in large grounds, and where map scale permits, the cover types may be shown separately. Otherwise, the most extensive cover type will be shown.

SOIL PIT AND SOIL BORING DESCRIPTIONS

Contents :

SOIL PROFILE DESCRIPTIONS : EXPLANATORY NOTE

Soil pit and auger boring information collected during ALC fieldwork is held on a database. This has commonly used notations and abbreviations as set out below.

Boring Header Information

1. GRID REF : national grid square and 8 figure grid reference.

2. USE : Land use at the time of survey. The following abbreviations are used.

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

3. GRDNT : Gradient as measured by a hand-held optical clinometer.

4. GLEY/SPL : Depth in cm to gleying or slowly permeable layers.

5. AP (WHEAT/POTS) : Crop-adjusted available water capacity.

6. MB (WHEAT/POTS) : Moisture Balance.

7. DRT : Best grade according to soil droughtiness.

8. If any of the following factors are considered significant, an entry of 'Y' will be entered in the relevant column.

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

9. 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 : Soil Erosion Risk WD : Combined Soil Wetness/Droughtiness ST : Topsoil Stoniness

Soil Pits and Auger Borings

1. 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
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 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)

2. MOTTLE COL : Mottle colour

3. 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%+

4. 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

5. PED. COL : Ped face colour

6. STONE LITH : One of the following is used.

HR : all hard rocks and stones MSST : soft, medium or coarse grained sandstone
SI : soft weathered igneous or metamorphic SLST : soft oolitic or dolimitic limestone
FSST : soft, fine grained sandstone ZR : soft, argillaceous, or silty rocks CH : chalk
GH : gravel with non-porous (hard) stones GS :gravel with porous (soft) stones

Stone contents (>2cm, >6cm and total) are given in percentages (by volume).

7. 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

8. 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

9. SUBS STR : Subsoil structural condition recorded for the purpose of calculating profile droughtiness.

G : good M : moderate P : poor

10. POR : Soil porosity. If a soil horizon has less than 0.5% biopores >0.5 mm, a 'Y' will appear in this column.

11. IMP : If the profile is impenetrable a 'Y' will appear in this column at the appropiate horizon.

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

13. CALC : If the soil horizon is calcareous, a 'Y' will appear in this column.

14. Other notations

APW : available water capacity (in mm) adjusted for wheat
APP : available water capacity (in mm) adjusted for potatoes
MBW : moisture balance, wheat
MBP : moisture balance, potatoes

SOIL PIT DESCRIPTION

Site Name : RUNFOLD SANDPIT Pit Number : 1P

Grid Reference: SU86564744 Average Annual Rainfall : 730 mm
Accumulated Temperature : 1440 degree days
Field Capacity Level : 155 days
Land Use : Permanent Grass
Slope and Aspect : 01 degrees SW

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	MOTTLES	STRUCTURE
0- 28	LMS	10YR32 00	3	5		MDCSAB
28- 49	LMS	10YR43 44	10	15		MDCOAB
49- 62	MS	10YR64 74	0	0	C	MDCOPL
62-120	LMS	10YR66 00	0	0	F	MDCOAB

Wetness Grade : 1 Wetness Class : I
Gleying : cm
SPL : No SPL

Drought Grade : 3B APW : 78 mm MBW : -20 mm
APP : 58 mm MBP : -48 mm

FINAL ALC GRADE : 3B
MAIN LIMITATION : Droughtiness

SAMPLE NO.	GRID REF	ASPECT USE		GRDNT	GLEY	SPL	--WETNESS-- CLASS	GRADE	-WHEAT- AP	MB	-POTS- AP	MB	M.REL DRT	FLOOD	EROSN EXP	FROST DIST	CHEM LIMIT		ALC	COMMENTS
1	SU86524746	PGR	SW	01			1	1	97	-1	77	-29	3A				DR		3A	Almost 3B
1P	SU86564744	PGR	SW	01			1	1	78	-20	58	-48	3B				DR		3B	
2	SU86594740	PGR	SW	01			1	1	98	0	77	-29	3A				DR		3A	Almost 3B
3	SU86534737	PGR	W	01			1	1	56	-42	59	-47	3B				DR		3B	

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0- 28	LMS	10YR32 00	3	5		MDCSAB
28- 49	LMS	10YR43 44	10	15		MDCOAB
49- 62	MS	10YR64 74	0	0	C	MDCOPL
62-120	LMS	10YR66 00	0	0	F	MDCOAB

Wetness Grade : 1
Wetness Class : I
Gleying : cm
SPL : No SPL

Drought Grade : 3B
APW : 78 mm MBW : -20 mm
APP : 58 mm MBP : -48 mm

FINAL ALC GRADE : 3B
MAIN LIMITATION : Droughtiness