LAND ADJACENT TO SLAD LANE, BYLAUGH, NORFOLK

Agricultural Land Classification Report & Statement of Soil Physical Characteristics

April 1999

Resource Planning Team
Eastern Region
FRCA Cambridge

RPT Job Number: 39/99
MAFF Reference: EL29/02994
LURET Job No: MLEG02994A

AGRICULTURAL LAND CLASSIFICATION REPORT & STATEMENT OF SOIL PHYSICAL CHARACTERISTICS

LAND ADJACENT TO SLAD LANE, BYLAUGH, NORFOLK

INTRODUCTION

1. This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of 31.8 ha of land at Bylaugh in Norfolk. The survey was carried out in April 1999.

2. The survey was carried out by the Farming and Rural Conservation Agency (FRCA) for the Ministry of Agriculture, Fisheries and Food (MAFF), in connection with an application by RMC Aggregates to extract sand and gravel from the area, followed by low level restoration to agricultural land.

3. The work was conducted by members of the Resource Planning Team in the Eastern Region of FRCA. The land has been graded in accordance with the published MAFF ALC guidelines and criteria (MAFF, 1988). This survey supersedes previous ALC information for this site. A description of the ALC grades and subgrades is given in Appendix I.

4. At the time of survey the whole site was under growing cereal crops and set-aside.

SUMMARY

5. The findings of the survey are shown on the enclosed ALC map. The map has been drawn at a scale of 1:10 000; it is accurate at this scale but any enlargement would be misleading.

6. The area and proportions of the ALC grades and subgrades on the surveyed land are summarised in Table 1.

Table 1: Area of grades and other land

Grade/Other land	Area (hectares)	% site area
3b	21.1	66
4	10.7	34
Total site area	31.8	100

7. The fieldwork was conducted at an average density of 1 auger boring per hectare. A total of 31 auger borings and 3 pits was described.

8. The majority of the site has been graded 3b (moderate quality agricultural land) and is restricted to this subgrade by significant droughtiness constraints. The remainder of the site has been assessed a severely droughty and is restricted to grade 4 (poor quality agricultural land). In small areas within both the subgrade 3b and grade 4 land, gradient imposes an equally limiting constraint to the land quality.

FACTORS INFLUENCING ALC GRADE

Climate

9. Climate affects the grading of land through the assessment of an overall climatic limitation and also through interactions with soil characteristics.

10. The key climatic variables used for grading this site are given in Table 2. These were obtained from the published 5 km grid datasets using the standard interpolation procedures (Met. Office, 1989).

Table 2: Climatic and altitude data

Factor	Units	Values
Grid reference	N/A	TG 024 198
Altitude	m, AOD	40
Accumulated Temperature	day°C (Jan-June)	1384
Average Annual Rainfall	mm	654
Field Capacity Days	days	131
Moisture Deficit, Wheat	mm	115
Moisture Deficit, Potatoes	mm	109
Overall climatic grade	N/A	Grade 1

11. The climatic criteria are considered first when classifying land as climate can be overriding in the sense that severe limitations will restrict land to low grades irrespective of favourable site or soil conditions.

12. The main parameters used in the assessment of an overall climatic limitation are average annual rainfall (AAR), as a measure of overall wetness, and accumulated temperature (ATO, January to June), as a measure of the relative warmth of a locality.

13. The combination of rainfall and temperature at this site mean it is relatively warm and dry and therefore has no climatic limitation. The site is therefore of climatic grade 1.

Site

14. The site is situated between the villages of Bylaugh and Billingford in Norfolk. It adjoins Slad Lane in the south and west, Dereham Road in the east and a valley bottom, beyond which are open fields, in the north. The highest land on site occurs in the proximity of Oak Farm where the altitude is about 46 m AOD. The lowest altitude is found in the extreme north-west at approximately 25 m AOD. The southern half of the site is virtually level, sloping almost imperceptibly towards the north and west. In the northern half the land slopes more steeply, typically at gradients of 2–6°, but occasionally more steeply at 7–12°. Typically, altitude and gradient do not restrict the land quality, but in a small area west of Gibbethill Wood, where gradients range between 7° and 12°, gradient imposes an equal limitation to the droughtiness constraints present. Both constraints equally restricting the land to subgrades 3b and grade 4.

Geology and soils

15. No detailed geology map exists for this area. At a scale of 1:250 000, the British Geological Survey have mapped the area as being entirely underlain by Cretaceous Upper Chalk. At a scale of 1:233 440, sheet 12, (GSGB[E&W]1936) drift edition, shows the area to be covered by glacial sands and gravels.

16. The Soils Survey of England and Wales have mapped the area on two occasions, at 1:100 000 in 1973 and at the reconnaissance scale of 1:250 000 in 1983.

17. The former shows a single soil type which includes soils of the Burlingham, Attlebridge, Hall and Freckenham Series. These soils are broadly described as: loamy or coarse loamy over sandy, and sandy soils.

18. The latter map depicts the whole area as the Burlingham 1 Association which is briefly described as: deep coarse and fine loamy soils with slowly permeable subsoils and slight seasonal waterlogging. Some deep well drained coarse loamy and sandy soils.

19. The current survey identified two main soil types.

Soil Type I (18.3 ha)

20. Soil Type I occurs on most of the higher ground in the south and on the lower slopes and valley floor in the north. Topsoils typically comprise slightly stony loamy medium sand (very occasionally medium sandy loam) and typically extend to 35 cm (range 30–40 cm). Upper subsoils mostly comprise very slightly to slightly stony loamy medium sand which merges into the lower subsoil at 50/60 cm, but occasionally continues to depth. The lower subsoil typically comprises very slightly to slightly stony loamy medium sand or medium sand which either continues to depth or becomes very stony and impenetrable to auger at 70/95 cm. Profiles are non-calcareous throughout and free draining.

Soil Type II (13.5 ha)

21. Soil Type II occurs in a band across the middle of the site (east to west), which corresponds with the midslopes, and around Oak Farm. Topsoils comprise loamy medium sands which extend to 30/35 cm and are typically moderately stony. Upper subsoils comprise loamy medium sand (occasionally medium sand) and are typically very stony (occasionally moderately stony). Typically the upper subsoil is impenetrable to auger immediately beneath the topsoil and can only be dug out with a spade. At 40/50 cm, profiles are invariably impenetrable to auger. Pit information indicates that below the augerable depth lower subsoils comprise very stony medium sand. Profiles are free draining and non-calcareous.

AGRICULTURAL LAND CLASSIFICATION

22. The details of the classification of the site are shown on the attached ALC map and the area statistics of each grade are given in Table 1, page 1.

23. The locations of the auger borings are shown on the attached sample location map.

Subgrade 3b

24. Land mapped as subgrade 3b corresponds with the soils described in paragraph 20. These medium sandy and typically slightly stony profiles retain a limited amount of water for crop growth. Moisture balance calculations confirm that the soils are therefore subject to a significant droughtiness constraint which restricts them to subgrade 3b. Very occasionally within this area, where topsoils and upper subsoils are better bodied, profiles are less droughty and have been assessed as subgrade 3a. However, at the scale of this survey, these isolated pockets of better quality land can not be delineated separately.

25. In the area west of Gibbethill Wood, where gradients range from 7° to 10°, slope is an equally limiting factor because such slopes impose significant limitations to the use of some farm machinery.

Grade 4

26. The grade 4 land on site corresponds with the soils described in paragraph 21, which are moderately to very stony and comprise sandy textures. These profiles have a very limited ability to retain water for crop growth. This land has therefore been assessed as severely droughty and is restricted to grade 4.

27. Where the land west of Gibbethill Wood slopes at gradients of 12°, a gradient limitation imposes an equally severe constraint to the land.

Adrian Rochford
Resource Planning Team
Eastern Region
FRCA Cambridge

SOURCES OF REFERENCE

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Soil Survey of England and Wales (1983) *Sheet 4, Soils of Eastern England.*
SSEW: Harpenden.

Soil Survey of England and Wales (1984) *Soils and their Use in Eastern England*
SSEW: Harpenden

Soil Survey of England and Wales (1973) *Soils of Norfolk.*
SSEW: Harpenden

APPENDIX I

DESCRIPTIONS OF THE 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 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 of this 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 land.

Grade 3: Good to Moderate Quality Land

Land with moderate limitations which affect the choice of crops, the 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.

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 the level of yields. It is mainly suited to grass with occasional arable crops (e.g. 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 severe limitations which restrict use to permanent pasture or rough grazing, except for occasional pioneer forage crops.

APPENDIX II

STATEMENT OF SOIL PHYSICAL CHARACTERISTICS

Soil Type I

Topsoil	Texture	loamy medium sand (very occasionally medium sandy loam)
	Colour	10YR 4/3 (occasionally 7.5YR 3/2)
	Stone content	typically slightly stony
	Roots	many very fine and fine
	Calcium carbonate	non-calcareous
	Boundary form	sharp/abrupt, wavy
	Depth	typically 35 cm (range 30–40 cm)
Upper subsoil	Texture	loamy medium sand (very occasionally medium sand or medium sandy loam)
	Colour	typically 10YR 4/5 (occasionally 10YR 5/5)
	Stone content	very slightly to slightly stony
	Structure	moderately developed coarse and very coarse angular blocky
	Consistence	very friable
	Porosity	>0.5%
	Roots	common/many very fine
	Calcium carbonate	non-calcareous
	Concretions	none
	Boundary form	abrupt, wavy/irregular
	Depth	typically 50/60 cm (occasionally to depth)
Lower subsoil	Texture	loamy medium sand or medium sand
	Colour	typically 10YR 5/5 (occasionally 7.5YR 5/4 or 4/6)
	Stoniness	typically very slightly to slightly stony and either continuing to depth or becoming very stony and impenetrable to auger at 70/95 cm.
	Structure	varies across site: single grain or massive
	Consistence	loose or friable
	Porosity	>0.5%
	Roots	few very fine
	Calcium carbonate	non-calcareous
	Concretions	none
	Depth	120 cm.

Notes: Profiles are free draining and therefore Wetness Class I.

Soil Type II

Topsoil	Texture	loamy medium sand
	Colour	10YR 4/3 (occasionally 7.5YR 3/2)
	Stone content	typically moderately stony
	Roots	many very fine and fine
	Calcium carbonate	non-calcareous
	Boundary form	abrupt, wavy
	Depth	30/35 cm
Upper subsoil	Texture	loamy medium sand (occasionally medium sand)
	Colour	typically 10YR 4/5 and 5/5 (occasionally 10YR 4/4, 5/6 or 7.5YR 3/4)
	Stone content	typically very stony (occasionally moderately stony)
	Structure	typically too stony to assess
	Consistence	very friable
	Porosity	>0.5%
	Roots	many very fine and fine
	Calcium carbonate	non-calcareous
	Concretions	none
	Boundary form	abrupt, wavy
	Depth	typically 40/50 cm and impenetrable to auger at this depth
Lower subsoil *	Texture	medium sand
	Colour	10YR and 7.5YR 5/5.
	Stoniness	very stony
	Structure	too stony to assess
	Consistence	loose
	Porosity	>0.5%
	Roots	common, becoming few with depth
	Calcium carbonate	non-calcareous
	Concretions	none
	Depth	120 cm.

Notes: Profiles are free draining and therefore Wetness Class I.
* information for the lower subsoil is from the pit only