

AGRICULTURAL LAND CLASSIFICATION

BROOMFIELD, KENT



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1. BACKGROUND

- 1.1 The site covers 18.5 ha and is situated to the north of the A299, south of Herne Bay and to the north-west of Broomfield in Kent. It is bounded to the north by the Whitstable to Margate railway line, to the west by Margate Road, (the B2205), to the east by Bogshole Lane (a rough track) and to the south by the A299.
- 1.2 The site was surveyed on 22 November 1989 using 110 cm and 120 cm Dutch soil augers, with samples being taken at approximately 100 m intervals across the site. Two soil inspection pits were also dug. The site forms part of a larger area previously surveyed in connection with the Herne Bay and Whitstable Local Plan. (MAFF, 1986).

Land-Use

- 1.3 At the time of survey, the western part of the site was under grass which was being grazed by horses. Some of the eastern part of the site was within the set-aside scheme, whilst across the remainder, a barley crop is believed to have failed and was overgrown with many weed species.

2. PHYSICAL FACTORS AFFECTING LAND QUALITY

Relief

- 2.1 The site lies at approx. 35-40 m A.O.D; in overall terms falling very gently towards the north. There are also very slight falls towards the south, away from the centre of the site. Gradient is not a significant limitation in terms of land quality at this locality.

Climate

- 2.2 The average annual rainfall for this area is approximately 590 mm, (Met. Office, 1989). The median accumulated temperature above 0°C between January and June, a measure of the relative warmth of the locality, is expected to be about 1450 day degrees, (Met Office, 1989). The site has approximately 121 days when the soil is at field capacity, an indication of the effect of climate on the soil water regime. This is a low period when considered in a national context and reflects the dry climate of the area. Crop adjusted moisture deficits are 125 mm for wheat and 123 mm for potatoes. These are again high values and are consistent with the dry coastal location.
- 2.3 The site is unlikely to be especially frost-prone and despite the coastal location, the land is not expected to be exposed due to the sheltering effect of the urban area to the north.

2.4 Climatic factors per se place no limitation on agricultural land quality but do affect interactive limitations between soil and climate, namely soil wetness and droughtiness.

Geology and Soils

2.5 Institute of Geological Sciences Sheet 273, Faversham (1974), shows the site to be underlain by Pleistocene & Recent Head Brickearth deposits over Eocene London clay.

2.6 Soil Survey of England and Wales, Soils of Kent, (1980) shows the whole area as typical argillic gley soils of the Park Gate association; deep, seasonally waterlogged, stoneless silty soils.

2.7 Detailed field examination of the soils indicates the presence of one main type across the site.

2.8 The soils typically comprise silt loam, medium silty clay loam or occasionally heavy silty clay loam topsoils, overlying similar textures in the upper subsoil and passing to medium silty clay, medium clay or occasionally heavy clay at variable depths, but commonly between 40 and 75 cm from the surface. Grey and ochreous mottling and gleying typically in combination with slowly permeable lower clayey subsoils is indicative of wetness problems which form the main limitation in land quality at this location. The limitation varies from minor to moderately severe depending upon the depth to the slowly permeable clay and the topsoil texture. This in turn influences workability and the flexibility for cropping and cultivations.

3. AGRICULTURAL LAND CLASSIFICATION

3.1 The ALC grading of the survey area is primarily determined by interactions between climate and soil factors, namely wetness and droughtiness. ALC grades 2, 3a and 3b have been mapped and a breakdown of these grades in terms of area extent is given below.

<u>Grade</u>	<u>ha</u>	<u>% of total agricultural land</u>
2	9.1	51
3a	7.2	40
3b	1.6	9
Total agricultural area	17.9	100
Non agricultural land)	0.6	
Farm buildings)		
Total area	18.5	

Grade 2

3.2 Land of this quality represents approximately 51% (9.1 ha), of the total agricultural land on the site. It occurs through the centre of the site, where the land is slightly higher than elsewhere. Profiles typically comprise silt loam or medium silty clay loam topsoils, overlying similar textures or heavy silty clay loam in the upper subsoil and passing to medium silty clay, medium clay or occasionally

heavy clay at depths below 50 cm. These soils are non-calcareous and generally stone-free. The main limitation to the agricultural potential of these soils is the presence of minor drainage imperfections as evidenced by common ochreous and grey mottling and gleying within the profile at variable depths, usually below 40 cm. Such drainage problems are typically associated with a slowly permeable clay horizon, commonly found at depths greater than 50 cm. In this dry location these soils are appropriately assigned to wetness class II.

Grade 3a

- 3.3 Grade 3a land occurs over approximately 40%, (7.2 ha), of the total agricultural land on the site, principally towards the northern part of the site, adjacent to the railway line, and also along the southern boundary, near the A299.
- 3.4 Soil profile typically comprise non-calcareous and stoneless silt loam, medium silty clay loam or occasionally heavy silty clay loam topsoils, overlying similar textures or occasionally medium silty clay in the upper subsoil and passing to medium silty clay or medium clay at depths between 40 and 50 cm from the surface. Although profiles are broadly similar to those graded 2, the presence of slowly permeable clay horizons higher in the soil profile increases the wetness limitation and places soils in wetness Class III. In addition due to the dry climatic regime, occasional profiles possess a slight droughtiness limitation as a result of either shallowness over an impenetrable gritty layer at c. 60 cm depth, or a poorly structured clay horizon in the lower subsoils. However it should be emphasized that the soils which fall into this grade are principally restricted by a wetness limitation and any droughtiness problem is of secondary importance only.

Grade 3b

- 3.5 Land of this quality occurs over approximately 1.6 ha, (9%) of the total agricultural land across the site, and is found toward the far north-western corner, adjacent to Bogshole Lane and the railway line.
- 3.6 Soil profiles typically comprise heavy silty clay loam topsoils directly overlying medium silty clay in the upper subsoil and passing to heavy silty clay at depths greater than 50 cm. The major limitation to the agricultural potential of these soils is a drainage imperfection, as indicated by gleying from a depth of c. 20 cm. This in combination with slowly permeable silty clay horizons immediately below the topsoil is an indication of a more severe wetness limitation compared with other locations on the site. This may be related to past disturbance of the soils, possibly the result of railway construction in the last century. Although these soils also possess a slight droughtiness restriction as a result of the clay textures in the subsoil, it is of minor significance as a limitation when considered along with the wetness problems present.

3.7 These soils in common with those graded 3a are also assigned to wetness class III, but the slightly heavier topsoil textures and the occurrence of silty clay textures high up the profile, prevent them from rising into a higher grade.

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Resource Planning Group
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Sources of Reference

INSTITUTE GEOLOGICAL SCIENCES (1974) 1:50000 Solid and Drift Edition
Geological Map Sheet No: 273 (Faversham)

MAFF (1986) Agricultural Land Classification. Herne Bay and Whitstable
local plan (Sheet 5). Resource Planning Group. Reading (Ref: 2002/003/86)

MAFF (1989) Agricultural Land Classification in England and Wales. Revised
guidelines and criteria for grading the quality of Agricultural Land.

METEOROLOGICAL OFFICE (1989) Climatological Data for Agricultural Land
Classification. Grid point datasets of climatic variables, at 5 km intervals
for England and Wales.

SOIL SURVEY OF ENGLAND AND WALES (1980) Soils of Kent (S.J. Fordham &
R.D. Green) Bulletin No.9

AGRICULTURAL LAND CLASSIFICATION:

Broomfield, Kent.

Auger Boring Schedule

1. Flat, grass, horses.

0 - 10 MZCL; 10 yr 3/2, non-calc.
10 - 30 MZCL; 10 yr 4/2, FFOM (may be root mottles)
30 - 45 MZCL; 10 yr 4/2, slightly paler than above
45 - 60 MZCL; FDOM and few Mn concs
matrix, 10 yr 4/2 and 5/2
mottles, 10 yr 6/6
gleyed from c. 50cm +
Mn concs increasing with depth
60 - 100+ MZC ; CDOGM and abundant Mn concs - Gleyed
10 yr 6/4 and 6/6 pale and ochreous mottles.

Gleyed from 50+) WC II Grade 2
Slowly permeable from 60+)

2. V.slight falls north, Grass (Set aside ?)

0 - 10 ZL ; 10yr 3/2, non-calc.
10 - 25 ZL ; 10yr 5/3 CFOM, Gleyed
25 - 50 M/HZCL; 10 yr 6/3, MDOM and Mn concs, Gleyed.
50 - 80 MZC; 10 yr 6/3 10yr 7/1, CDOM - 7.5yr 5/8
Gleyed, Mn concs abundant

Gleyed from c. 10+) WC III Grade 3a
Slowly permeable from 50+)

3. V.V.slight falls south, Grass

0 - 35 ZL ; 10yr 4/2, non-calc.
35 - 42 MZCL ; 10yr 4/3
42 - 60 MZCL ; 10yr 5/4 CDOM and Mn concs
becoming HZCL from 50+
60 - 80+ MZC ; 10yr 6/4 CDOM, Gleyed

Gleyed from 60+)
Slowly permeable from 60+) WC II Grade 2

4. Sl.slope south, Grassland (Set Aside ?)

0 - 25 ZL ; 10yr 4/2, non-calc
25-50 MZCL; 10yr 5/3, few faint grey mottles
50-80+ MZC ; 10yr 5/3, CDOGM and Common Mn concs
Gleyed
Ochreous mottles and colours increasing with depth

Gleyed from 50+) wc II grade 2
Slowly permeable from 50+)

5. V.V.slight falls north, Grass

22 ZL ; 10yr 4/2, CFOM (may be root mottles)
22- 40 ZL ; few faint grey mottles
matrix - 10yr 5/2
40 - 55 ZL ; 10yr 5/4, FFOGM
55 - 65 MZCL 10yr 5/4, FFOGM
65- 85+ MZC ~~ubom~~ and Mn concs, Gleyed
10yr 5/3, matrix
10yr 5/6, ochreous mottles and 10yr 7/2, pale mottles.

5. (cont'd)...

Gleyed from 65+)
Slowly permeable from 65+) WC II Grade 2.

6. Slight Slope north, Grassland (Set Aside ?)

0 - 28 ZL ; 10yr 4/2, non-calc
28 - 50 MZCL; 10yr 5/3, Gleyed
v.few faint ochreous mottles and Mn concs.
few small lime fragments - slightly calc.
50 - 70 M/HZCL; 10yr 6/4 matrix, FFOGM
10yr 6/6 ochreous mottles and few Mn concs
Gleyed
70 - 80+ HZCL; as above

Gleyed from 28+)
Not slowly permeable) WC II Grade 2
within 80 mm)

7. Lower slopes in field, failed barley crop and many weeds

SMALL PIT

0 - 23 M/HZCL ; non-calc
23 - 40 HZCL/MC; non-calc
10yr 5/3, matrix, CDOM
weakly dev - moderately dev, coarse
sub.angular blocky
friable consistence
>0.5% biopores
NOT SLOWLY PERMEABLE

40 - 80+ MC . ; 10yr 6/3, CDOGM - Gleyed
coarse sub. angular blocky - coarse prismatic
friable firm consistence
< 0.5% biopores
becoming increasingly ochreous with depth
SLOWLY PERMEABLE

Gleyed from 40+) WC III Grade 3a/b
Slowly permeable from 40+)

8. Lower/mid-slopes, failed barley crop and many weeds
V.slightly stony surface.

0 - 25 MZCL ; 10yr 4/1, non-calc
25- 40 MZCL ; 10yr 5/3, F/CFOM, Gleyed
slightly stony c.40-50cm
40- 60 HZCL ; 10yr 5/3, matrix
CDOM, 7.5yr 5/8 + Mn concs, Gleyed
60-100+ MC ; 10yr 5/3 matrix
CDOM, 7.5yr 5/8 Gleyed
ochreous colouration increasing with depth

Gleyed from 25+)
Slowly permeable from 60+) wc II/III Grade 2/3a

9. Lower slopes, failed barley crop and many weeds.

0 - 23 MZCL/ZL ; 10yr 4/2, non-calc
23 -100 M/HZCL ; non-calc
seems to go to HZCL then become lighter again
(70cm+)
possibly banded brickearth type deposits
10yr 5/3, becoming 10yr 6/3.
600 m 7: 5yr 5/8, Gleyed
ochreous colours increasing with depth

Gleyed from 23+) WC II Grade 2
Not slowly permeable)
within 80+

10. Lower slopes, recently established grass (Set Aside ?)

0 - 23 MZCL ; 10yr 4/2
23 - 45 HZCL ; 10yr 6/4
CDOGM + Mn concs, Gleyed
45 - 80+ MZC 10yr 6/4 and 10yr 6/6
CDOGM and Mn concs; Gleyed

Gleyed from 23+)
Slowly permeable from 45+) WC III Grade 3a

11. Lower slopes, Grass (Set Aside?)

0 - 25 MZCL ; 10yr 4/2, non-calc
25 - 50 MZCL ; 10yr 6/4 matrix and CFOM
few Mn concs, Gleyed
50 - 55 HZCL ; 10yr 6/4
MDOG - 7.5yr 5/8, Gleyed
55 -100 MZL ; 10yr 6/4 and 5/3
MDOG Gleyed

Gleyed from 25+)
Slowly permeable from 55+) WC III Grade 3a

12. Mid/upper slopes, failed barley crop and many weeds
V.V.slightly stony on the surface (flints)

0 - 30 ZL/MZCL ; 10yr 4/2, non calc
30 - 45 MZCL ; 10yr 5/2,- 5/4
45 - 70 MZCL
becoming
HZCL ; 10yr 5/3
FDOM to 50 and then CDOGM, Gleyed
70-100 MZC ; 10yr 5/3
MDOG, 7.5 yr 5/8
increasing ochreous colouration with depth

Gleyed from 45+)
Slowly permeable from 70+) WC II Grade 2

13. Slight Slope south, grass; disturbed ?

0 - 20 HZCL ; 10yr 4/2
20 - 55 MZC ; CDOGM and Mn concs
10yr 5/3 matrix
10yr 6/2 grey mottles, Gleyed
V.heavily gleyed from 50cm +
55 - 90+ HZC colours as above, with increasing pale,(10yr 6/2) and
ochreous, (7.5yr 6/8) colours.

14. V.V. gentle falls west, grass, disturbed ?

0 - 30 MZCL ; 10yr 4/2
30 - 45 HZCL ; 10yr 5/3 matrix. FFOGM and Mn concs
10 yr 6/2 grey mottles, Gleyed
45 - 60 Gritty
MC ; Gleyed
60+ Impenetrable - Gritty

Gleyed from 30+)
Slowly permeable from 45+) WC III Grade 3a/b

Drought

15. Upper Slopes, failed barley crop and many weeds.

0 - 25 ZL/MZCL ; 10yr 4/2, non-calc.
25 - 35 MZCL ; 10yr 5/3-5/4
35 - 60 M/HZCL ; 10yr 5/3
CDOGM - Gleyed
60 - 75 HZCL ; 10yr 6/4 and 6/6
CDOGM + many Mn concs
7.5yr 5/8, ochreous mottles
10yr 7/1, grey mottles
75-100 HC ; CDOGM
colours as above

Gleyed from 35+)
Slowly permeable from 75+) WC II Grade 2

16. Lowest part of site, Grass (Set Aside ?)

0 - 23 MZCL ; 10yr 4/2, non-calc
23 - 50 HZCL ; 10yr 6/4 and 7/3
CDOM - Gleyed
50 - 90+ MZC ; 10yr 6/4 and 10yr 6/6
CDOGM - Gleyed

Gleyed from 23+)
Slowly permeable from 50+) WC III Grade 3a.

PIT DETAILS

PIT NEAR BORING NO.9.

Slight slope north, failed barley crop and many weeds.

Cloddy surface, virtually stoneless

0 - 32 MZCL ; 10yr 4/2, non-calc.
Stoneless.

32 - 70 HZCL ; 10yr 6/4, matrix
~~column~~ - Gleyed
moderately well developed, coarse prismatic
and coarse sub. angular blocky
friable consistence
common worm channels
greater than 0.5% biopores - NOT SP

70 - 100+ HZCL ; becoming more ochreous in colour as
ochreous mottles become more abundant

PIT NEAR BORING NO.7

See description in auger boring list.