

FOR DIVISIONAL USE ONLY

AGRICULTURAL LAND CLASSIFICATION

LAND AT RACKHEATH (SITE 1)

1. BACKGROUND

- 1.1 An "Agricultural Land Classification (ALC) of the Norwich Area" was carried out by MAFF in 1983 to provide a general guide to land quality for local planning purposes. The current survey was undertaken in October 1989 to provide more detailed ALC information for 19.1 ha of land at Rackheath (site 1).
- 1.2 The 1983 survey identifies the majority of the land at this site as grade 3b in the south and east, fringed by a strip of grade 2 land along the northern boundary.
- 1.3 At the time of survey the land was in arable production with crops of cereals and sugar beet. Potatoes had been grown in the previous year.
- 1.4 17 soil inspections were made on a 100m grid basis giving an intensity of inspection of approximately 1 per ha. Soils were sampled to a depth of 120 cms using a hand held Dutch soil auger, and data obtained were supplemented by information from two soil profile pits.

2. PHYSICAL FACTORS AFFECTING LAND QUALITY

- 2.1 Rackheath lies in an area of relatively low rainfall by national standards, with an estimated average annual rainfall for the site of 644 mm (Met Office, 1989). This is relatively evenly distributed throughout the year with a slight spring minimum in the months of February to May (MAFF, 1984). This drier period aids spring cultivations, but may also lead to drought stress due to the relatively low available water capacity of the coarse loamy soils in this area.

- 2.2 The Rackheath area has an estimated growing season of 248 days from late March to late November (MAFF 1984), and Meteorological Office data interpolated for the site, indicate that soils are at field capacity for approximately 125 days and soil moisture deficits are estimated as 116 mm for wheat and 111 mm for potatoes.
- 2.3 The site is neither particularly exposed nor frost prone.
- 2.4 Climate itself is not limiting to agricultural land quality. However, the interaction of climate with soil texture in this relatively dry area results in the soil variants at this site being susceptible to drought.

Altitude and Relief

- 2.5 The site is gently sloping and lies at an altitude of approximately 33m AOD in the east of the site falling to 29m AOD in the west and south west.
- 2.6 Altitude and gradient are not limiting to agricultural land quality.

3. GEOLOGY AND SOILS

- 3.1 No detailed geology map is available for this area. However, the published 1:250,000 solid geology map "East Anglia" - sheet 52°N-00°W (British Geol. Surv., 1985) shows the whole area to be underlain by Upper Chalk (Cretaceous).
- 3.2 The site lies immediately to the east of the 1:50,000 series solid and drift edition geology map, Sheet 161 (Geol. Surv. of Great Britain, 1975). This map shows the drift geology of the adjoining area to be glacial sands and gravels (Pleistocene and Recent). The current survey confirmed the continuation of these deposits which are overlain by aeolian deposits.

- 3.3 The 1:250,000 soils map "Soils of Eastern England" is the most detailed soil map available for this area. This shows the occurrence of the Newport 4 Association* over the complete site.
- 3.4 The current survey confirmed the presence of freely-drained (Wetness class I) soils in the south and west of the site although these tended to be coarse loamy rather than sandy. Coarse loamy soils with reduced subsoil permeability (Wetness class III) were identified in the east of the site extending along the northern boundary.
- 3.4.1 Typical soil profiles in the south and west of the site comprise very slightly stony, sandy loam or occasionally sandy silt loam topsoils overlying sandy loam, sandy silt loam or very occasionally medium sand upper subsoils which extend to a depth of between 50 cms and 80 cms (typically 55/65 cms). Upper subsoils were generally only very slightly stony. Below this, horizons of sandy loam, loamy sand and sand extend to depth, with profiles typically overlying sand below 80-90 cms. These soils are freely draining and are assessed as wetness class I.
- 3.4.2 In the north and east of the site, soils are very similar to those described in paragraph 3.4.1 with very slightly stony sandy loam or sandy silt loam topsoils overlying sandy loam and sandy silt loam upper subsoils. Immediately below the topsoil, however, and extending to an average depth of 55/60 cms, the upper subsoil is very compacted and proved impenetrable to the hand auger. Soil profile pit observations show that subsoil structure is massive with extremely firm consistence, indicating reduced subsoil permeability (limiting these soils to wetness class III), and significantly reducing the soil water reserves available to plants. This compaction is thought to be of natural origin and would be difficult to alleviate by cultivation or subsoiling, so that it presents an ALC limitation. Below 55/60 cms, moderately stony sand or loamy sand occurs and this overlies stoneless sand below 80 cms.

* Newport 4 Association: Deep well-drained sandy soils. Some very acid soils with bleached subsurface horizons especially under heath or in woodland.

3.5 Due to the coarse loamy textures of the soils described in paragraphs 3.4.1 and 3.4.2, available water holding capacity for these soils is low. This, coupled with the relatively low annual average rainfall of the Rackheath area, results in the soils being susceptible to drought, and this constitutes the principal limitation to ALC grade.

4. AGRICULTURAL LAND CLASSIFICATION

4.1 The site has been graded using the Revised Guidelines and criteria for grading the quality of agricultural land (MAFF, 1988). Under this system, land is graded according to the degree to which physical or chemical characteristics impose long term limitations on agricultural use.

4.2 Definitions of the Agricultural Land Classification grades are included in Appendix 1.

4.3 The table below shows the breakdown of ALC grades for the land at Rackheath site 1.

Grade	ha	%
2	3.7	19.2
3a	5.8	30.5
3b	8.3	43.6
Urban	0.8	4.3
Non agricultural	0.5	2.4
Total	19.1	100

5. GRADE 2

Approximately one fifth of the site is graded 2. This occurs in a single block in the west of the site.

5.1 Land of this quality is associated with loamier variants of the freely-drained soils described in paragraph 3.4.1 where sandy silt loam topsoils overlie sandy loam or sandy silt loam upper subsoils to below 60-80 cms. Land of this type is excluded from grade 1 by minor drought constraints. Although these are unlikely to affect

flexibility of cropping, they are likely to result in slightly reduced yields in most seasons.

6. SUBGRADE 3a

Approximately one third of the site is graded 3a. This is located in the centre and south western corner of the site.

- 6.1 Land graded 3a is associated with sandier variants of the freely-drained soils described in paragraph 3.4.1. Here, topsoils generally comprise sandy loams. Sandy loam or occasionally sandy silt loam upper subsoils extend to an average depth of only 50-65 cms+, before loamy sand and sand are encountered, and these extend to depth. Again, droughtiness is the chief limitation to agricultural land quality, although the degree of constraint is somewhat greater than on land graded 2. This moderate droughtiness limitation results in the land being graded 3a.

7. SUBGRADE 3b

Land graded 3b covers approximately two fifths of the site, and is located in a single block in the north east, extending westwards along the northern boundary.

- 7.1 Land of this quality is associated with the slowly permeable, compacted soils described in paragraph 3.4.2. Profile pit observations indicate that compaction is sufficiently severe to restrict plant rooting which effectively imposes a significant drought constraint. This, combined with the inherently low available water capacity of this soil type, increases drought risk and restricts the land to subgrade 3b.

8. NON-AGRICULTURAL

An area of non-agricultural land is identified south of Cherry Tree Farm.

9. URBAN

Two areas of urban land are identified, firstly Yew Tree Farm and adjacent residential properties, and secondly an electricity transfer station.

Resource Planning Group
Cambridge RO

November 1989

Appendix 1

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 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 will 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.

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 crop.

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.

REFERENCES

MAFF, 1972 : Agricultural Land Classification Map No 126, Scale 1: 63 360.

METEOROLOGICAL OFFICE, 1989: Climatological Data for Agricultural Classification.

MAFF, 1984 : The Agricultural Climate of England and Wales, Reference Book 435, HMSO, London.

GEOLOGICAL SURVEY OF ENGLAND AND WALES, 1975 : Solid and Drift Edition Geology Map No 161 "Norwich" Scale 1: 50 000.

SOIL SURVEY OF ENGLAND AND WALES, 1984 : Soils of Eastern England - Sheet No 4, Scale 1:250 000.

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