

8FCS 2977

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YOUNGWOOD LANE, NAILSEA, AVONAGRICULTURAL LAND CLASSIFICATION
REPORT OF SURVEY1. INTRODUCTION

Following an ad hoc non-agricultural development planning application, a detailed Agricultural Land Classification (ALC) survey was carried out on 58.5 hectares on the southern fringe of Nailsea, Avon, in March, 1989.

The fieldwork was conducted by members of the Resource Planning Group (South West Region) at an approximate auger sampling density of one boring per hectare. A total of 60 borings and 4 soil pits were described.

The ALC provides a framework for classifying land according to the extent to which its physical or chemical characteristics impose long-term limitations on agricultural use. The distribution of grades and sub-grades for the site is detailed in Table 1 below and illustrated on the ALC map at a scale of 1:10,000

The location of the auger sample points (ASPs) and soil pits is shown on the ASP map.

Table 1: The Distribution of ALC Grades and Sub-grades

<u>Grade</u>	<u>Area (ha)</u>	<u>% of Survey Area</u>	<u>% of Agricultural Ar</u>
2	11.7	20.1	21.7
3A	18.6	31.8	34.5
3B	15.2	26.0	28.2
4	8.4	14.4	15.6
Non-Agric	0.6	1.0	100% (53.9 ha)
Urban	1.8	3.0	
Farm Bldgs	2.0	3.4	
Water	<u>0.2</u>	<u>0.3</u>	
	58.5 ha	100%	

Total Agricultural Area = hectares

2. Climate

Estimates of important climatic variables were obtained by interpolation from a five kilometre grid database in order to assess any overall climatic limitation. The results are detailed below in Table 2.

Table 2: Climatic Interpolations*

Accumulated Temperature (°days)	:	1531
Average Annual Rainfall (mm)	:	847
Field Capacity Days	:	191
Moisture Deficit, Wheat (mm)	:	95
Moisture Deficit, Potatoes (mm)	:	85

*At Grid Reference 34701694 in the centre of the survey area at an average altitude of 20 metres.

Accumulated temperature is a measure of the relative warmth of a locality and average annual rainfall is a measure of the overall wetness. In combination, these interpolations reveal that there is no overall climatic limitation affecting the site.

There was also no evidence found in the area of any locally limiting climatic factor such as exposure or aspect.

3. Topography and Geology

The majority of the site is flat or gently sloping land underlain by Pennant Measures there, slope is not a limiting factor but microrelief is generally significant. The land is undulating and the depth to an impenetrable layer is locally quite variable. Parts of the site, for example near ASPs 41 and 43, present a stepped or terraced topography which may be a reflection of the underlying bedding.

Slope becomes locally significant along part of the northern fringe. At the base of these slopes there is evidence of significant wetness problems which seem to be related to the presence of groundwater and/or a springline. A band of shale, interbedded with the Pennant Measures, causes an obstruction to the downward seepage of water.

The south-eastern section of the survey area occupies a flat floodplain, where the soils have developed over alluvium. A large artificial lake adjacent to this area probably affects the local drainage, keeping the water tables in the surrounding soils higher than would otherwise be the case.

4. Agricultural Land Classification

Grade 2 : An area of Grade 2 land has been mapped adjacent to White Oak House (GR 471 696). Pit 1 is typical of these deeper profiles which exhibit little evidence of soil wetness. Soil workability is the main limitation. Top soil textures vary between medium clay loam and medium sandy silt loam; given this variability the soils are downgraded to Grade 2 at the prevailing field capacity day level (191 days).

Sub-grade 3A: the majority of the site has been placed in this grade, and four soil pits have been examined. Depth to the impenetrable rock is often the critical factor, and the majority of the soil profiles have been downgraded to 3A as a result of inadequate water supply in the profile to meet the more demanding needs of grades 1 and 2. The soil pits revealed a weathering zone of approximately 15 cm which contained 50% flaggy sandstone and which was usually impenetrable to the soil auger. Soil depth, however, did appear quite variable and many supplementary borings were necessary to confirm the grade.

The profiles examined typically have medium clay loam topsoils which may extend to depth or change into sandy clay loams in the subsoil above the weather sandstone.

Soil pit number 4 describes those heavier, wetter 3A soils which occur along the northern fringe. These soils with medium clay loam topsoils grade into red clay subsoils with evidence of gleying (pale ped faces and manganese) and slowly permeable layers. These subsoil characteristics place the soils in

Wetness Class III, and produce a grade according to soil wetness of 3A at the prevailing value for Field Capacity Days.

Sub-grade 3B; four map units of this grade have been identified. In the north, an area on the eastern side of Youngwood Lane has been mapped where gradient becomes locally significant.

In the extreme south, part of the floodplain has been mapped as 3B. Here, lightish textured topsoils (MSZL, MCL) overlie heavy, intensely mottled clay subsoils with shallow slowly permeable layers. The soils fall into Wetness Class IV

The map unit of 3B identified in the north west of the site is a combination of soils downgraded as a result of steep slopes and those adjacent flat areas where soil wetness is significant. One final area of 3B has been mapped in the centre of the survey area. The boundary of this unit includes a narrow receiving site where soil wetness is the most limiting factor (perhaps related to the problem of local springlines) and an adjacent area of very shallow soils where droughtiness is significant. The centre of the wet depression is in fact grade 4 but, at the current scale of mapping, is placed in a grade 3B map unit which includes the adjacent slopes of the depression which are not quite as wet.

Grade 4 : the majority of the floodplain alluvium falls within this classification. Here, heavy clay loam topsoils overlie clay subsoils with very shallow slowly permeable layers (SPL). The soils are evidently gleyed in the top 40 cms and the depth to the SPL places them in Wetness Class IV. Given the heavy topsoil textures and the prevailing Field Capacity Day value (191 days), the soils fall into grade 4. Similar adjacent soils but with lighter topsoils are placed in 3B.

An additional small area of grade 4 has been mapped in the extreme north-west of the site. This is an area which is severely affected by groundwater wetness and by a possible spring line. At the time of survey, parts of this field were under water and sedges were abundant (indicative of prolonged periods of soil wetness). Adjacent areas of similar topography were graded as 3B on soil wetness (where SPLs could be identified). On this grade 4 sites no SPLs could be identified and the area seemed to be at least one degree worse in terms of soil wetness (the water table was present between 40-60 cm) than the adjacent land. Part of the field had also been disturbed: topsoil with high stone contents had been spread. As a result, the land is felt to be no higher than Grade 4.

Soil Profile Descriptions: Explanatory Note

Soil texture classes are denoted by the following abbreviations:

Sand **S**; Loamy Sand **LS** Sandy Loam **SL**; Sand Silt Loam **SZL**; Silt Loam **ZL**;
Medium Silty Clay Loam **MZCL**; Medium Clay Loam **MCL**; Sandy Clay Loam **SCL**;
Heavy Silty Clay Loam **HZCL**; Heavy Clay Loam **HCL**; Sandy Clay **SC**;
Silty Clay **ZC**; Clay **C**

For the sand, loamy sand, sandy loam and sandy silt loam classes the predominant size of sand fraction may be indicated by the use of prefixes, thus:

F fine (more than $\frac{2}{3}$ of sand less than 0.2 mm)
C coarse (more than $\frac{1}{3}$ of sand greater than 0.6 mm)
M medium (less than $\frac{2}{3}$ fine sand and less than $\frac{1}{3}$ coarse sand)

The sub-divisions of clay loam and silty clay loam classes according to clay content are indicated as follows:-

M medium (less than 27% clay); **H** heavy (27-35% clay)

Other possible texture classes include:

Peat **P**; Sandy Peat **SP**; Loamy Peat **LP**; Peaty Loam **PL**;
Peaty Sand **PS**; Marine Light Silts **MZ**

The prefix "**Calc**" is used to identify naturally calcareous soils containing more than 1% Calcium Carbonate.

For organic mineral soils, the texture of the mineral fraction is prefixed by "**org**".

Other notation:

st	stones (6 cm)
sst	small stones (2 cm - 6 cm)
vsst	very small stones (2 mm - 2 cm)
Mn	manganese
cdom/cfom	common distinct/feint ochreous mottles
mpom	many prominent ochreous mottles (VMPOM = very many ..)
Few = 1-5%; common = 6-15%; many = 16-35%; very many = +35%	

Nailsea

SOIL PIT DESCRIPTIONS

Pit No 1

Topsoil :

0-18 cm
Medium sandy silt loam
10YR 4/3
2% stones 2-6 cm

Subsoil 1

18-42 cm
Medium clay loam
7.5YR 4/4
6% stones 2-6 cm; 1% stones < 2 cm
Weak medium subangular blocky; very friable
< 0.5% biospores > 0.5 mm

Subsoil 2

42-80 cm
30% stones 2-6 cm; 3% stones 2 cm
(soft med/coarse grained sandstone)

Subsoil 3

80+ cm
Sandstone

AP wheat = 137 mm; MD wheat = 95 mm; MB wheat = +42 mm
AP potatoes = 112 mm, MD potatoes = 85 mm, MB potatoes = +27 mm
Grade According to Droughtiness = 1

Pit No 2

Topsoil : 0-23 cm
Medium Clay Loam
10YR42

Subsoil 1 : 23-33 cm
Medium Clay Loam
7.5YR44
approx. 10% stones, 2-6 cm (Visual estimate)

Subsoil 2 : 33-48 cm
Medium Clay Loam
7.5YR44
approx 50% stones (Sieve); hard sandstone
Good structure assumed (high stone content prevented assessment)

Subsoil 3 : + 48 cm
Rock (ie greater than 70% stone), hard sandstone

AP Wheat = 81 mm (using TAV/EAV values of 1%/0.5% for the rock and stones)
AP Pots = 79 mm
MB Wheat = 14 mm
MB Pots = 6 mm
Grade according to Droughtiness = 3A

Pit No 3

Topsoil : 0-20 cm
Medium Clay Loam
10YR43

Subsoil : 20-47 cm
Sandy Clay Loam
7.5YR44
approx. 10% stones, 2-6 cm (sieve), hard sandstone
Coarse and Medium Sub-angular Blocky; Weakly developed; friable
(ie Good Structure)

Subsoil 2 : 47-57 cm
Sandy Clay Loam; Good structure assumed (difficult to assess
with high stone content)
7.5YR44
approx. 50% stones (sieve); hard flaggy sandstone

Subsoil 3 : + 57 cm
Rock (ie, greater than 70% stone) hard sandstone.

AP Wheat = 94 mm (using hard rock values)
AP Pots = 99 mm
MB Wheat = -1 mm
MB Pots = +14 mm
Grade according to Droughtiness = 3A

DESCRIPTION OF THE GRADES AND SUBGRADES

The ALC grades and subgrades are described below in terms of the types of limitation which can occur, typical cropping range and the expected level and consistency of yield. In practice, the grades are defined by reference to physical characteristics and the grading guidance and cut-offs for limitation factors in Section 3 enable land to be ranked in accordance with these general descriptions. The most productive and flexible land falls into Grades 1 and 2 and Subgrade 3a and collectively comprises about one-third of the agricultural land in England and Wales. About half the land is of moderate quality in Subgrade 3b or poor quality in Grade 4. Although less significant on a national scale such land can be locally valuable to agriculture and the rural economy where poorer farmland predominates. The remainder is very poor quality land in Grade 5, which mostly occurs in the uplands.

Descriptions are also given of other land categories which may be used on ALC maps.

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 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 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.

Descriptions of other land categories used on ALC maps

Urban

Built-up or 'hard' uses with relatively little potential for a return to agriculture including: 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: golf courses, 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. A distinction may be made as necessary between farm and non-farm 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 land cover types, eg buildings in large grounds, and where map scale permits, the cover types may be shown separately. Otherwise, the most extensive cover type will usually be shown.