

LISKEARD AND DISTRICT LOCAL PLAN
AGRICULTURAL LAND CLASSIFICATION
REPORT OF SURVEY

1. Introduction

In October and November 1991 a detailed Agricultural Land Classification (ALC) was carried out around Liskeard, Dobwalls, St Cleer, Pensilva and Menheniot, Cornwall as part of MAFF's statutory input into the Liskeard and District Local Plan.

The fieldwork was carried out by the Resource Planning Group at a scale of 1:10,000 and this survey supersedes the previous survey around Liskeard at a scale of 1:25,000, being at a more detailed level and carried out under the Revised Guidelines and criteria for grading the quality of agricultural land (MAFF 1989). A total of 572 ha were surveyed.

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 grading takes into account the top 120 cm of the soil profile. The distribution of the ALC grades is detailed for each survey area and illustrated on the accompanying ALC maps. The information is accurate at the scale of mapping but any enlargement would be misleading.

The surveys show that there are significant amounts of high quality land around Liskeard, Dobwalls and Menheniot whilst that around Pensilva and St Cleer is of less value in terms of agricultural quality. Sub-grade 3A land is considered to be 'best and most versatile' land.

2. Liskeard

An area of 233 ha was surveyed around Liskeard. A total of 108 borings and 3 soil pits were described. The distribution of grades is detailed in Table 1.

Table 1 Distribution of ALC grades around Liskeard

Grade	Area (ha)	% Survey Area	% of Agricultural Land
3a	120.1	51.4	58.5
3b	52.5	22.5	25.6
4	23.3	10.0	11.3
5	9.5	4.1	<u>4.6</u>
Non Agric	16.7	7.2	100% (205.4 ha)
Urban	9.8	4.2	
Farm Bldgs	<u>1.5</u>	<u>0.6</u>	
Total	233.4	100%	

- 2.1 The grade of the land is determined by the most limiting factor present. The overall climate is considered first because it can have an overriding influence on restricting land to lower grades despite other favourable soil or site conditions. To assess any overall climatic limitation, estimates of important climatic variables were obtained for the site by interpolation from the 5 km grid Met Office/MAFF database. (Climatological Data for Agricultural Land Classification. Met Office/MAFF/SSLRC 1989). The indicative parameters used for assessing such a limitation are accumulated temperature (a measure of the relative warmth of a locality) and average annual rainfall (a measure of overall wetness). The results, shown in Table 2, reveal that there are climatic limitations across the survey area. Below 98 m the land can be graded no better than grade 2 and above 98 m no better than sub-grade 3A. No local climatic risk factors such as exposure were observed in the survey area.

Table 2 Climatic interpolations: Liskeard

Grid Reference	SX262637	SX268645	SX245641	SX240647
Height (m)	135	100	90	75
Accumulated Temperature (° days)	1474	1513	1525	1542
Average Annual Rainfall (mm)	1366	1338	1322	1309
Field Capacity (Days)	266	262	261	259
Moisture Deficit, wheat (mm)	62	68	70	73
potatoes (mm)	44	52	55	58
Overall climatic grade	3a	3a	2	2

2.2 Sub Grade 3a

The majority of the survey area has been classified as sub-grade 3a. The soils are free draining with increasing stone content with depth but the low moisture deficits prevent the soils from being droughty. The typical soil profile has 50 cm of medium clay loam with about 2% soft stones in the topsoil and 10% in the upper subsoil, with heavy clay loam to depth with 30% plus soft slate. The soils show no evidence of wetness so can be assigned to wetness class I. The high level of FCD's means that even with a medium clay loam the soils are restricted to sub-grade 3a on workability. A workability limitation means that the number of days in which it is possible to carry out cultivations and graze without damaging the structure of the soil are limited.

2.3 Sub-grade 3b

All the sub-grade 3B land, except for a small area at the bottom of Venslove Hill was wet, is limited by gradients. Slopes with gradients over 7° create a safety risk when using certain types of machinery reducing the versatility of the land.

The small area of wetter soil showed evidence of wetness from the surface in the form of gleying and a slowly permeable depth from 45 cm. With such evidence it is expected that the profile would be wet within 40 cm for up to 210 days in a year and wet within 70 cm for more than 180 days. The soils are assigned to wetness class IV and with a medium silty clay loam topsoil are placed in 3B.

2.4 Grades 4 and 5

The remainder of the survey area has been classified as grades 4 and 5 on the basis of the limiting gradients present, which restrict the safe use of machinery. Slopes with gradients no greater than 18° can be classified as grade 4, but greater than this are limited to grade 5.

3. Dobwalls

An area of 84 ha was surveyed around the village of Dobwalls. A total of 62 borings and 2 soil pits were examined. The distribution of grades is detailed in Table 3.

Table 3 Distribution of ALC grades around Dobwalls

Grade	Area (ha)	% Survey Area	% of Agricultural Land
3a	59.8	71.4	83.7
3b	9.4	11.2	13.2
4	2.2	2.6	<u>3.1</u>
Non Agric	2.4	2.8	100% (71.4 ha)
Urban	8.7	10.4	
Farm Bldgs	<u>1.3</u>	<u>1.6</u>	
Total	83.8	100%	

3.1 Climate

A climatic interpolation as previously described was carried out for Dobwalls. The results (shown in Table 4) show that a climatic limitation exists across the survey area. Below 103 m the land is limited to grade 2 and above 103 m the land can be graded no better than sub-grade 3A. No local climatic limitations such as exposure were observed in the survey area.

Table 4 Climatic interpolations: Dobwalls

Grid Reference	SX210653	SX220652	SX220650
Height (m)	160	105	100
Accumulated Temperature (° days)	1446	1508	1514
Average Annual Rainfall (mm)	1375	1348	1315
Field Capacity (Days)	267	264	259
Moisture Deficit, wheat (mm)	61	70	71
potatoes (mm)	42	53	55
Overall climatic grade	3a	3a	2

3.2 Sub-grade 3A

The majority of the survey area has been classified as sub-grade 3A. The topsoils are medium clay loams and the soils show no evidence of wetness so are placed in wetness class I.

Typical profiles have medium clay loams to 50 cm with 2% slate in the topsoil and about 40% slate in the upper subsoil. The lower subsoil is heavy clay loam with over 60% slate much of which is below 2 cm in size. The low moisture deficits preclude the risk of droughtiness. The high FCD value means that despite medium clay loam topsoils and wetness class I the soils can only be classed as sub-grade 3a. This workability limitation is the result of restrictions on the timing of cultivations and grazing without damage to the soil structure. Damage could impede free drainage.

3.3 Sub-grade 3B

The area around Great Twelvewoods farm is downgraded to 3B because there is a slight drainage problem reflected in the presence of gleying down the profile. These soils are assigned to wetness classes II and III according to depth to gleying and with medium clay loam topsoils can only be graded as 3B, for the prevailing FCD. The remaining areas of 3B are restricted to this grade by gradients which impose limitations on the use of machinery to some extent.

3.4 Grade 4

Two small areas of grade 4 have limiting gradients which restrict the use of certain machinery and land on which the risk of soil erosion is increased if cultivation takes place.

4. St Cleer

An area of 82 ha was surveyed around St Cleer and Tremar. A total of 17 borings and 1 soil pit were examined. The distribution of grades is detailed in Table 5.

Table 5 Distribution of ALC grades around St Cleer

Grade	Area (ha)	% Survey Area	% of Agricultural Land
3b	77.2	94.2	97.2
4	2.2	2.7	<u>2.8</u>
Urban	2.1	2.6	100% (79.4 ha)
Non Agric	<u>0.4</u>	<u>0.5</u>	
Total	81.9	100%	

4.1 Climate

A climatic interpolation as previously described was carried out for St Cleer. The results (shown in Table 6) show that a climatic limitation exists in the survey area. The level of accumulated temperature and the high average annual rainfall mean that the area cannot be graded better than sub-grade 3B. No local climatic limitations such as exposure were observed.

Table 6 Climatic interpolations: St Cleer

Grid Reference	SX245680	SX259679
Height (m)	215	140
Accumulated Temperature (° days)	1381	1466
Average Annual Rainfall (mm)	1564	1486
Field Capacity (Days)	298	287
Moisture Deficit, wheat (mm)	50	61
potatoes (mm)	27	43
Overall climatic grade	3b	3b

4.2 Sub-grade 3B

The climatic limitation imposes the greatest limitation across the site restricting it to sub-grade 3B. The soils, though slightly stoney, are free draining. A typical profile has medium clay loams to 50 cm with 5% slate in the topsoil and less stone in the upper subsoil. The lower subsoil has a moderate structural condition in a heavy clay loam with around 2% slate.

4.3 Grade 4

There are two small areas of slope where the gradient creates a greater limitation to versatility than the climate. Here the gradients restrict the safe use of much cultivation machinery and restrict the land use to primarily grazing.

5. Pensilva

An area of 103.1 ha was surveyed around the village of Pensilva. A soil pit was examined to confirm that the soils were not the limitation determining the grade. Pensilva, like all other areas surveyed around Lisheard is underlain by slates. The soils formed over the slate in this area are very consistent in nature. The soil pit confirmed the similarity. The distribution of grades is detailed in Table 7.

Table 7 Distribution of ALC grades around Pensilva

Grade	Area (ha)	% Survey Area	% of Agricultural Land
3b	9.3	9.0	13.2
4	58.9	57.2	83.9
5	2.0	1.9	<u>2.9</u>
Non Agric	13.2	12.8	100% (70.2 ha)
Urban	19.4	18.8	
Farm Bldgs	<u>0.3</u>	<u>0.3</u>	
Total	103.1	100%	

5.1 Climate

A climatic interpolation as previously described was carried out for Pensilva. The results (shown in Table 8) reveal that severe climatic limitations exist across most of the site. Below 190 m the land is restricted to grade 3B and above 190 m it is restricted to grade 4. No local climatic limitations such as exposure were observed in the survey area.

Table 8 Climatic interpolations: Pensilva

Grid Reference	SX383699	SX298699	SX299694
Height (m)	265	180	190
Accumulated Temperature (° days)	1322	1419	1408
Average Annual Rainfall (mm)	1715	1585	1602
Field Capacity (Days)	319	300	302
Moisture Deficit, wheat (mm)	31	48	46
potatoes (mm)	4	27	24
Overall climatic grade	4	3b	4/3b

5.2 Sub-grade 3B

Below 190 m the area is restricted to sub-grade 3B provided there are no greater limitations such as gradient. Here as elsewhere on the site the soils are free draining. The relatively stone free topsoils of medium clay loam texture extend to 25 cm depth giving way to much stonier (35% plus) heavy clay loam subsoils with moderate structural condition.

5.3 Grade 4

The majority of the survey area is limited to grade 4 by the prevailing climate. (The adverse climate affects the potential for plant growth and interactively with the soil restricts the timing of cultivations and grazing without causing damage to the soil structure.) The soils here are similar to those described in section 5.2. There are some areas of slope within the area below 190 m which limit the land to grade 4 on the basis of the restriction to safe use of cultivation machinery on these gradients.

5.4 Grade 5

There is a small area of slope north of Middle Hill Farm where the gradients greatly restrict the safe use of machinery affecting the versatility of the land.

6. Menheniot

An area of 69 ha was surveyed around Menheniot. A total of 39 borings and 2 soil pits were examined. The distribution of grades is detailed in Table 9.

Table 9 Distribution of ALC grades around Menheniot

Grade	Area (ha)	% Survey Area	% of Agricultural Land
3a	28.2	40.7	43.2
3b	25.9	37.4	39.6
4	7.8	11.3	12.0
5	3.4	4.8	<u>5.2</u>
Urban	3.2	4.6	100% (65.3 ha)
Non Agric	<u>0.8</u>	<u>1.2</u>	
Total	69.3	100%	

6.1 Climate

A climatic interpolation as previously described was carried out for Menheniot. The results are shown in Table 10 and reveal that climatic limitations exist across the survey area. Below 60 m the land can be graded no better than grade 2, whilst between 60-120 m it is more restricted being grade 3A. Above 120 m the climatic limitation increased and restrict the land to grades no better than 3B. No local climatic limitations such as exposure were observed in the survey area.

Table 10 Climatic interpolations: Menheniot

Grid Reference	SX291682	SX284674	SX285677	SX292679
Height (m)	140	55	65	120
Accumulated Temperature (° days)	1465	1563	1551	1488
Average Annual Rainfall (mm)	1488	1344	1363	1449
Field Capacity (Days)	285	264	267	279
Moisture Deficit, wheat (mm)	59	77	75	63
potatoes (mm)	40	63	61	46
Overall climatic grade	3b	2	2/3a	3a/3b

6.2 Sub-grade 3A

All the sub-grade 3A land lies beneath an altitude of 120 m. The soils are free draining with increasing stone content at depth. The topsoils are medium clay loams with heavy clay loam subsoils. With no evidence of impaired drainage the soils fall into wetness class I but at the prevailing FCD value the soil can at best be classified as sub-grade 3A.

6.3 Sub-grade 3B

In the north of the survey area above 120 m the land is limited to sub-grade 3B climatically. These soils however are the same as those found in the 3A areas. The remaining blocks of 3B land are restricted to this grade by gradients which restrict the safe use of the full range of machinery, except for a small area at the foot of the valley to the west of the village which is wet and thus down graded.

6.4 Grades 4 and 5

The remaining slopes impose greater restrictions on the safe use of machinery and risk of soil erosion is greater if cultivations take place. The versatility of this land is greatly reduced. The gradients $>11-18^\circ$ are placed in grade 4, whilst those greater than 18° are restricted to grade 5.

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 include 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.

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.